1.3.2 Average percentage of courses that include experiential learning through project work/fieldwork/ internship during last five years

Link to Sample Project

1. Link to Sample Project Bengali
2. Link to Sample Project English
3. Link to Sample Project Geography
4. Link to Sample Project BBA
5. Link to Sample Project BCA
6. Link to Sample Project Economics
7. Link to Sample Project Environmental Studies
8. Link to Sample Project Political Science
9. Link to Sample Project Physics

Bengali

BIDHAN CHANDRA COLLEGE

KAZI NAZRUL UNIVERSITY, ASANSOL

NAME :- AMIT DUTTA

DISICIPLINE :- BENGALI (SEC)

COURSE NAME :- PRAKALPA PATRA ROCHONA O UPOSTHAPONA

COURSE CODE :- BAPBNGSE602

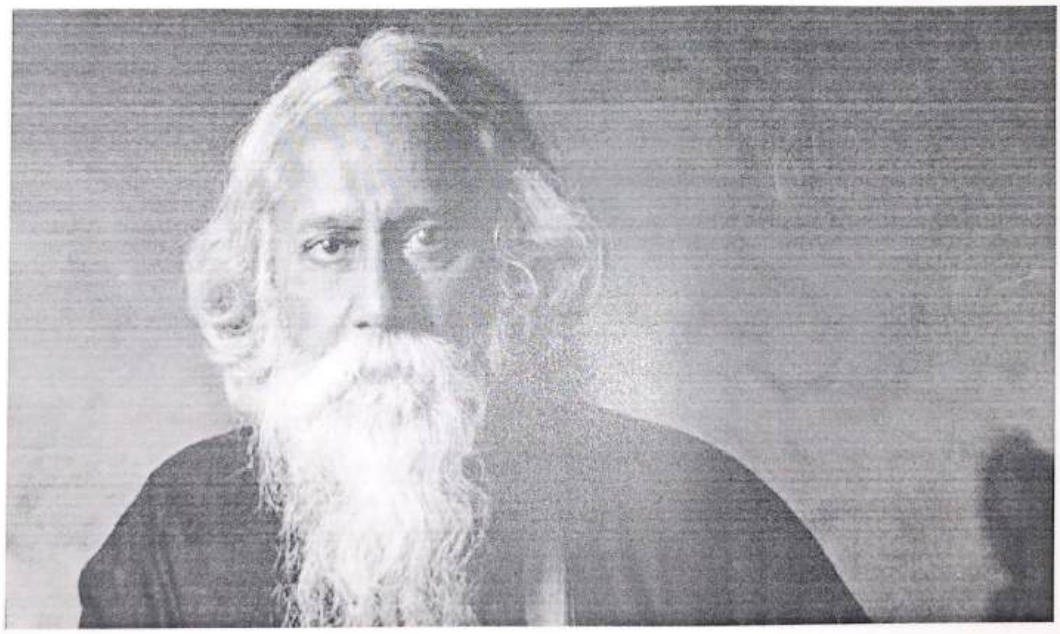
KNU REGISTRATION NO :- 10321111004 8

SESSION :- 2021-2022

SEMESTER :- 6th.

TEACHER'S SIGNATURE

সূচিপত্র



হাজার বছরের বাংলা সাহিত্যে বিরল প্রতিভাধারী বিস্ময়কর সৃষ্টি প্রতিভা কবি রবীন্দ্রনাথ ঠাকুর (১৮৬১–১৯৪১), রবীন্দ্রনাথ প্রকৃতির রূপ-বৈচিত্র ও নানা রূপ রহস্যের কবি। প্রকৃতিকে এত সজীবভাবে অন্তরে ও বাহিরে উপলব্ধি আর কখনো কেউ করেন নি। বাংলা সাহিত্যের যে কয়টি অঙ্গনে রবীন্দ্রনাথের সার্থক পদচারণা রয়েছে তার মধ্যে একটি সফল দিক ছোটগল্প।

রবীন্দ্রনাথকে নিজেই তার গল্প সম্পর্কে বলেছেন- "একটু একটু করে লিখছি এবং বাইরের প্রকৃতির সমস্ত ছায়া আলোক বর্ণ ধ্বনি আমার লেখার সঙ্গে মিশে যাচ্ছে, আমি যেসব দৃশ্যলোক ও ঘটনা কল্পনা করছি, তারই চারদিকে এই রৌদ্র-বৃষ্টি, নদীস্রোত এবং নদীতীরের শরবন, এই বর্ষার আকাশ, এই ছায়াবেষ্টিত গ্রাম, এই জলধারা প্রফুল্ল শস্যের ক্ষেত ঘিরে দাঁড়িয়ে তাদের সত্য ও সৌন্দর্য সজীব করে তুলছে।"

রবীন্দ্রনাথ প্রকৃতির নিগূঢ় নগ্ন সৌন্দর্য ও অনির্বচনীয় মাধুর্য এমন সুক্ষ্মভাবে তুলে ধরেছেন যে তিনি ছোটগল্পের প্রতিটি ক্ষেত্রেই প্রকৃতি চেতন।

◇ **পোস্টমাস্টার:** রবীন্দ্রনাথের 'পোস্টমাস্টার' গল্পের চরিত্রগুলো প্রকৃতি -কে আবেষ্টন করে আছে, এখানে প্রকৃতিই প্রধান চরিত্র। "মিটি মিটি করিয়া প্রদীপ জ্বালিতে লাগিল এবং এক স্থানে ঘরের জীর্ণ চাল ভেদ করিয়া একটি মাটির সরার উপর টপ টপ করিয়া বৃষ্টির জল পড়িতে লাগিল।"

নদীর সামনে গ্রাম্য বালিকার করুণ মুখচ্ছবি যেন এক চিরস্থায়ী হয়ে অন্তরে মর্মবেদনা প্রকাশ করিতে লাগিল, -- পালে তখন বাতাস পাইয়াছে, নদীর স্রোত ও খরতর বেগে বহিতেছে, গ্রাম অতিক্রম করে নদী কূলের শ্মশান দেখা যাইতেছে।

প্রকৃতির সন্তান রবীন্দ্রনাথ তার জীবন ও বিচিত্র রচনায় প্রকৃতিকে এক পৃথক স্থান দিয়েছেন। তার ছোটগল্পে বিষয় নির্বাচনেও তা পরিলক্ষিত। কোনো নিছক বিনা প্রকৃতিতে কিছু তার কাছে ছিলনা।

◊ **সুভা:-** 'সুভা' গল্পে আমরা প্রত্যক্ষ দেখতে পাই, সুভা যেন প্রকৃতি-র অন্তরঙ্গ অংশ, প্রকৃতি সুভার মধ্যে মানবী রূপ ধারণ করে মানুষের কাছে বন্ধুত্বের হাত বাড়িয়ে দিয়েছে, তার কল্পনায় নদীর কলধ্বনি, লোকের কোলাহল — এত মিলিয়া চারিদিকের চলাফেরা আন্দোলন কম্পনের সহিত এক হইয়া সমুদ্রের তরঙ্গ রাশির ন্যায় চিরনিস্তব্ধ হইয়া উপকূলের নিকট আসিয়া পড়ে। প্রকৃতির এই বিবিধ শব্দ এবং বিচিত্র গতি, ইহাও বোবার ভাষা।

◊ **একরাত্রি:-** রবীন্দ্রনাথের এই প্রেমের স্রোত বয়ে ওঠা আরেক গল্প 'একরাত্রি'। যেখানে প্রেম ও প্রকৃতি মিলেমিশে একাকার হয়ে গেছে, আগুনে পতঙ্গ পুড়লেও যে যেমন কেবল আগুনেরই খোঁজ করে তেমনি গার্হস্থ্য প্রেমের সাথে প্রকৃতির খোঁজ করে। প্রেমের বিষয় একটা প্রভাব। নিঝুম একটি রাত, আমি এই

নব বাংলা মহাপ্রলয়ের তীরে দাঁড়াইয়া অনন্ত আনন্দের আস্বাদ পাইয়া-ছি,

রবীন্দ্রনাথ প্রকৃতির ভাষা বোঝেন। তিনি প্রকৃতির রূপ, স্পর্শ ইন্দ্রিয় ও অনুভব সাংকেতিকতায় তার গল্পের উপজীব্য বিষয়। 'মেঘ ও রৌদ্র' গল্পে গিরিবালা ও শশীভূষণের মধ্যে যে আদান-প্রদান, লুকোচুরি খেলা তা যেন মেঘ ও রৌদ্রের খেলারই মতোই,

◊ নষ্টনীড়ঃ- 'নষ্টনীড়' গল্পে চারুলতার জীবনের হাহাকার বেদনার কবিত্ব দিনগুলির নিঃসঙ্গ অসহায় প্রকৃতিই তার পাশে দাঁড়িয়েছে। যখন সন্ধ্যা, বাগানের ঠিক ইহাত কুঁড়ি ফুলের গন্ধ আসিতেছিল, ছিন্ন মেঘের ভিতর দিয়া স্নিগ্ধ আকাশে তারা দেখা যাইতেছিল, আর চারু চুল বাঁধে নাই, কাপড় ছাড়ে নাই, ঘর অন্ধকারে আস্তে আস্তে তাহার খোলা চুল উড়াইতেছে এবং তার চোখ দিয়া জল ~~ঝরঝর~~ ঝরঝর করিয়া কেন জল ঝরিয়া পড়িতেছে তাহা সে নিজেই বুঝিতে পারিতেছে না,

◊ সমাপ্তিঃ- 'সমাপ্তি' গল্পে প্রকৃতি ঠাকুর মতো নিজের পাশে দাঁড়িয়েছে, বনমালীর আনন্দ বিষাদকুর প্রতিচ্ছবি। কোনো লোকের তাকে দুষ্ট মেয়ে-বলি এই মেয়েটি কিন্তু তবুও রবীন্দ্রনাথ তুলিতে 'ছিলেন নদীর ধারে ঘাস সঞ্চিত করিয়া বসিয়া থাকিত, কোন দিন বা কাজ করিত না, নারিকেলগুলো ছবির মতো স্থির দাঁড়াইয়া রহিত, মাথার

উপরে অনেক তারা আকাশ্মলে দুলিতে থাকিত?,

রবীন্দ্রনাথ প্রকৃতিপ্রেমিক। তার সৃজনশীল মনের প্রতিফলন তাদের প্রকৃতির অনুভূতিতে দেখা যায়, রবীন্দ্র যেখানে প্রকৃতির মাঝে নানাভাবে প্রস্ফুটিত হয় তিনি প্রকৃতির আনন্দে লালিত হয়ে।

◊ <u>ক্ষুধিত পাষাণ</u>:- 'ক্ষুধিত পাষাণ' গল্পে পাগলা মেহের আলীর চিৎকার 'তফাৎ যাও' আমাদের কানে উচ্চকিত হয়ে পাঠকের হৃদয়ে আলোড়ন করেছে। রাত্রির নিস্তব্ধতার অনেক রহস্যময় শক্তিকে পরিব্যপ্ত করে। গল্পের গভীর প্রকৃতি আর মানুষের অনুভব মনের অতিপ্রাকৃত হিসেবে চিন দেয়।

<u>উপসংহার</u>:- উপরিউক্ত আলোচনার দ্বারা আমরা দেখতে পাই যে- প্রকৃতি রহস্যময়, রবীন্দ্রনাথ সে রহস্য উদঘাটন করলেন, তার গল্পগুলির অভিব্যক্ত প্রকৃতির মধ্যে অন্তরাত্মা রূপ, নদী, মাঠ, বন প্রভৃতি মিশিয়ে তার রহস্য তুলে ধরেছেন, প্রকৃতির অবাধ আকাঙ্ক্ষাকে জানিয়ে দিয়েছেন, অসম্পূর্ণতাকে সম্পূর্ণতা দান করেছেন, প্রকৃতি ও মানবের মাঝে যেটুকু নিবিড় প্রেম সম্পর্ক -কে সম্পন্ন করে দিয়েছেন, রবীন্দ্রনাথ প্রতিষ্ঠিত এক প্রকৃতির চিত্রকর নাম।

Kazi Nazrul University
Bidhan Chandra College

Topic : নজরুলের কবিতায় আত্মজৈবনিক চেতনা

Discipline : SEC Bengali

Name : Purba Sarkar

Semester : VI

Subject : Prakalpa patra Rachana o upasthapana

Subject code : BAPBNGSE602

Registration No. : 1032111100 32

ROLL Number : 103210611100 3125

Year of Examination : 2024

Academic Year : 2021 - 22

নজরুলের কবিতায় সাম্যবাদী চেতনা :-

কবি কাজী নজরুল ইসলাম যে সাম্যবাদী আদর্শে বিশ্বাসী ছিলেন তা তার লেখনীতে তুলে ধরেছেন, তিনি একজন প্রকৃত সাম্যবাদী কবি ছিলেন, তার প্রতিফলন আমরা তাঁর কবিতা - গানে তার প্রতিফলন দেখতে পাই। কবির মন ছিল অত্যন্ত কোমল, মানুষের সামান্যতম দুঃখ কষ্টকেও তার হৃদয়ে বেদনার রেখাপাত করে গেছে, যা আমরা কবির লেখা পাঠ করলেই সহজে অনুধাবন করতে পারি। চরম দারিদ্রতা তাকে কষাঘাতে নিষ্পেষিত করেছে বলেই কী তিনি নিজেকে এই ঘুণে ধরা সমাজ থেকে মুক্তির আহ্বান জানিয়েছেন? হয়তো তাই। তা না হলে তিনি তার কবিতায় কী সহজেই এভাবে সমাজের কুলি মজুরদের নিয়ে তাদের ওপর নির্যাতনের যে রেখাচিত্র তুলে ধরেছেন তা কী তিনি পারতেন? হয়তো পারতেন। তার পরেও বলব তিনি জীবনকে সমাজকে আপন আয়নায় দেখেছেন আর ছবির মতো করে তুলে এনেছেন তার একের পর এক কবিতায়।

কৈশোরেই নজরুলের মধ্যে অসাম্প্রদায়িক মানসিকতার ভিত্তি গড়ে ওঠে, যা পরবর্তীতে তাকে সাম্যবাদী হতে পথ মসৃণ করে দেয়। রানীগঞ্জে নজরুলের শৈলেন্দ্রকুমার ঘোষ নামে একজন প্রিয় বন্ধু ছিল, নজরুল ইসলাম মুসলমান, শৈলজানন্দ মুখোপাধ্যায় হিন্দু - ব্রাহ্মণ, আর একজন ছিল খ্রিষ্টান। তিন বন্ধু একসঙ্গে খেলাধুলা করতেন, একসঙ্গে বেড়াতেন। এই যে তিন ধর্মের তিন বন্ধু একত্রে মেলামেশার কারনেই নজরুলের ভেতর সেই কৈশোর থেকেই অসাম্প্রদায়িক চেতনা গেড়ে বসেছে। পরবর্তীতে তারই প্রতিফলন, তাকে অসাম্প্রদায়িক চেতনায় উজ্জীবিত করেছে।

দারিদ্র্যের কারনেই তিনি ব্রিটিশ পরিচালিত উনপঞ্চাশ নম্বর বেঙ্গলী রেজিমেন্টের সৈনিক হিসেবে করাচী সেনানিবাসে ভারতীয় সেনাবাহিনীতে যোগ দিয়েছিলেন, তার সৈনিক জীবনই তার মোড় ঘুরিয়ে দেয়। সেখানেই তিনি কাজের অবসরে বসে বসে কাব্যচর্চা শুরু করেন। রুশ বিপ্লবের সময় সারা দুনিয়ায় যখন সর্বহারার জয়গান সমুচ্চারিত হতে থাকে, ঠিক তখনই কবি নজরুলকেও তা নাড়া দিয়ে যায়, দোল খায় তার মনেও, তার তখনই নজরুল লিখে ফেললেন :

'সিন্ধুপারের সিংহদ্বারে ধমক হেনে ভাঙল আগল,'

এই কবিতা দিয়েই নজরুল তার সাম্যবাদী আদর্শের ঘোষণা দেন বলেই ধরে নেয়া যায়। আমরা তার প্রথম প্রকাশিত এই কবিতার দিকে তাকালে দেখতে পাই তার 'মুক্তি' কবিতাটি তার সাম্যবাদী চেতনার স্ফুরণ ঘটায়। নজরুল তার মুক্তি কবিতাটি 'বঙ্গীয় মুসলিমান সাহিত্য' সমিতির নবমতরে পাঠান, সেই সুবাদেই বঙ্গীয় মুসলিমান সাহিত্য সমিতির সংস্পর্শে মুজফ্ফর আহমেদের সংস্পর্শে তার যোগাযোগ ও পরিচয় হয়। প্রথম বিশ্বযুদ্ধ শুরু হলে মুজফ্ফরের পরামর্শে নজরুল সৈনাবাহিনীর চাকরি ছেড়ে দেন। নজরুল কমরেড মুজফ্ফর আহমেদের সংস্পর্শে এসেই আরও বেশী সাম্যবাদী চিন্তার প্রকাশ ঘটে। নজরুলের লেখায়, নজরুল কর্তৃক প্রকাশিত ও পরিচালিত 'ধূমকেতু', 'লাঙল', 'নবযুগ', 'গণবাণী' প্রভৃতি পত্রপত্রিকা হয়ে ওঠে সাম্যবাদী চিন্তার মুখপত্র। ১৯২২ সালের ১২ই আগস্ট নজরুলের সম্পাদিত ২য় সাপ্তাহিক 'ধূমকেতু' প্রকাশিত হয়। নজরুলের সবচেয়ে চর্চিত বক্তব্য হিসেবে প্রকাশিত হতে থাকে। 'ধূমকেতু' রাজনৈতিক বক্তব্যটির নামকরণ করেন, নজরুলই স্বয়ং।

১৯২৫ সালের ২৬ ডিসেম্বর মুজফ্ফর আহমেদ লেবার স্বরাজ পার্টির মুখপত্র হিসেবে সাপ্তাহিক 'লাঙল' পত্রিকার প্রকাশ করেন, কাজী নজরুল ইসলামকে 'লাঙল' - এর সম্পাদক পরিচালক হিসেবে দায়িত্ব দেয়া হয়। 'লাঙল' - এর প্রথম সংখ্যাতেই নজরুলের 'সাম্যের গান' কবিতাটি লেখেন:

'গাহি সাম্যের গান,
যেখানে এসিয়া এক হয়ে গেছে সব বাধা-ব্যবধান
যেখানে মিশেছে হিন্দু- বৌদ্ধ- মুসলিম-খ্রীস্টান,
গাহি সাম্যের গান,'

'গানবাণী' তেই নজরুল ১৯২৭ সালে যে নিবন্ধ শ্রমজীবীদের আন্তর্জাতিক সঙ্গীত বা 'দ্য ইন্টারন্যাশনাল' গানের বঙ্গানুবাদ করেন, গানটি যদিও কবি ইউজিন পাতিয়ের রচিত। সঙ্গীত হিসেবে গেয়ে থাকেন, নজরুল অনুবাদটির নাম দিয়েছিলেন 'অন্তর ন্যাশনাল সংগীত'।

সাম্যবাদী এ কবি পরবর্তীকালে তিনি এরের পর এক লেখেন, 'শ্রমিকের গান', 'লাল পতাকার গান', 'বীরের গান' ইত্যাদি শ্রমজীবী মানুষের শ্রেণী চেতনার গান, মার্কসীয় চেতনার সাথীর স্বভাব বিস্তার করেছে নজরুলের সাম্যবাদী ও 'সর্বহারা' কবিতায়, 'সাম্যের বৈশিষ্ট্য' কবিতায় প্রকাশ পেয়েছে মেহনতী মানুষের হৃদয়ের বেদনার কথা,

সাম্যবাদীরাই- অসাম্প্রদায়িক তাইতো কবি নজরুলও ছিলেন অসাম্প্রদায়িক চেতনার এক মূর্ত প্রতীক, তিনি মানুষে মানুষে ভেদাভেদ খুঁজে পাননি, তার কাছে কোনো জাত পাত ছিল না, সকল মানুষকে তিনি মানুষ পরিচয়ে দেখতে চেয়েছেন, তাই তিনি কবিতায় বলেছেন:

'সকল কালের সব দেশের সব মানুষ আসি
এক জোয়ালে দাঁড়াইয়া গুন এক মিলনের বাঁশি,'

নজরুলের অনেক কবিতায় সাম্যবাদের উচ্চকিত উচ্চারণ রয়েছে, এর মধ্যে অন্যতম কবিতাগুলি হলো, সাম্যবাদী, সলমোল্লাসি, বিদ্রোহী, কাণ্ডারি হুঁশিয়ার, সর্বহারা, মুক্তির সেবকের গান, মানুষ, আনন্দময়ীর আগমনী, উদ্বোধন ইত্যাদি, নজরুলই প্রথম কবিতায় সি.টি.কা আইনকের বিরুদ্ধে বিদ্রোহের ঘোষনা করেন, প্রতিবাদী হয়ে উঠলেন সকল অন্যায় কোশল আর নির্যাতনের বিরুদ্ধে, তাই তিনি তার 'সলমোল্লাসি' কবিতায় উচ্চকিত উচ্চারন করেন,

'তোরা সব জয়ধ্বনি কর!
তোরা সব জয়ধ্বনি কর!!
ঐ নূতনের কেতন ওড়ে কাল-বোশেখীর ঝড়,'

নজরুলের অসাম্প্রদায়িক চেতনার মূল কথা জুড়ে আছে সবার উপরে মানুষ সত্য তাহার উপরে নাই, এ মহিমান্বিত তিনি বিশ্বাস করতেন হিন্দু হোক, মুসলমান হোক, খ্রিস্টান হোক, নিপীড়িত মানবতার একতাই পরিচয়, তারা শোষিত বঞ্চিত মানুষ,

আর তার কলমে সব সময় শোষিত লাঞ্ছিত নিপীড়িত মানুষের জন্য সোচ্চার ছিল, সার্বে উঠেছে মানব মানবিকতায় যা সমসাময়িক অন্য কবিদের চাইতে ভিন্নমাত্রায় বিচার করা যায়, নজরুলের সাম্যবাদী ও মানবতার জন্যই সে সময় তিনি সর্বাধিক পরিচিতি লাভ করেন, কারণ, তিনি মানুষের শোষণকে, নির্যাতনকে সরাসরি চোখে আঙুল দিয়ে দেখান। কবিতায় মানবিকতার দিকপাল কাজী নজরুল তাইতো উদাত্ত কণ্ঠে উচ্চারণ করেন,

"দেখিনু সেদিন রেলে,
কুলি বলে এক বাবু সাব তারে ঠেলে দিল নিচে ফেলে!
চোখ ফেটে এল জল,
এমনি ক'রে কি জগৎ জুড়িয়া মার খাবে দুর্বল!'

মানবতাবাদী নজরুল ছিলেন অসাম্প্রদায়িক মানবতাবাদী চিন্তায় উদ্বুদ্ধ। তিনি অনুভব করেন মানবধর্মকে, মানুষকে, মানবীয় চেতনাকে, তাই সাম্যবাদই তার কাছে প্রধান বিষয় হয়ে ওঠে, কবিতার প্রস্ফুটিত হয়েছে বারংবার। জগত - মাতৃত্ব, পিতাকে নজরুল মানবপ্রেমের সঙ্গে দেশ-প্রেমকে মিশিয়েছেন, মাতৃত্ব, পিতাকে মার সাথে তুলনা করেছেন। তাইতো জগতকে নিয়ে তার উক্তিতে উচ্চারণ,

'অসহায় জাতি মরিছে ডুবিয়া, জানে না সন্তরণ,
কাণ্ডারী! আজ দেখিব তোমার মাতৃমুক্তি পণ।
"হিন্দু না ওরা মুসলিম?" ঐ জিজ্ঞাসে কোন্ জন?
কাণ্ডারী! বল ডুবিছে মানুষ, সন্তান মোর মা'র।'

তবে নজরুলের সাম্যবাদী কবিতার সবচেয়ে বড় দৃষ্টান্ত তার বিদ্রোহী কবিতা, যা অনস্বীকার্য। এ ছাড়াও সাম্যবাদী নজরুলের নিচের কবিতাটি সাম্যবাদের আরেকটি চমৎকার দৃষ্টান্ত :

'সাম্যের গান
যেখানে আসিয়া একই হয়ে গেছে সব বাধা-ব্যবধান,
যেখানে মিলেছে হিন্দু-বৌদ্ধ-মুসলিম-খ্রীষ্টান,'
আবার দেখা যায়,

মানুষকে তিনি সর্বোচ্চ আসনে অধিষ্ঠিত করেছেন, হিন্দু-মুসলিম-বৌদ্ধ-খ্রিস্টান বলাটা আসল পরিচয় হতে পারেনা, আসল পরিচয় হলো আমরা সবাই মানুষ।

এছাড়াও তার কলমে উচ্চারিত হয়েছে, 'জাতের চাইতে মানুষ সত্য / আত্মিক সত্য স্নানের টান / স্নান করে সব একসমান', 'ঈশ্বর' কবিতায় নজরুল ইসলাম ঈশ্বর অন্বেষণের ব্যাপার বলেছেন, বনে-জঙ্গলে, পর্বত চূড়ায় ঈশ্বর অন্বেষণের কোনো প্রয়োজন নেই। ঈশ্বর মানব মানেই অধিষ্ঠিত, আর আজু অন্বেষণে না গিয়ে সত্যের সন্ধানে অগ্রসর হতে বলেন, ঈশ্বর মানুষের মধ্যেই বিরাজিত, তাকে বাইরে না খুঁজে নিজের মধ্যে ডুব দিতে হবে,

কবি বলেছেন, 'অন্তরে খোঁজো আপনারে তুমি আপনি বিরাজিছ খুঁজে', সর্বোপরি কবি 'সাম্য' কবিতায় স্বপ্নের দেশ আদর্শ দেশের কথা বলেছেন, এমন দেশ যেখানে রাজা-প্রজা নেই, ধনী-দরিদ্রের ভেদাভেদ নেই, 'সাম্যবাদী' এ স্থানে বর্ণবৈষম্য নেই, এখানে সাদা ও কালোদের ভিন্ন আলাদা কোন স্থান বা জায়গা নেই, এখানে কোনো বর্ণের বা জাতের ভেদ নেই, নেই কোলাহল, যেখানে পাশী, পরিত, মোল্লা একত্রে পালে জল খেলেও জাত যাবে না, প্রার্থনা বাতিল হবে না,

সাম্যবাদ বাংলা সাহিত্যে নতুন কোনো বিষয় নয়, কিন্তু কবিতায় নজরুল ইসলাম যে মানবতা মিশ্রিত সাম্যের প্রসঙ্গ তুলে ধরেছেন তা সত্যিই অভিনব, এখানেই নজরুলের সাম্যবাদী চেতনার নতুন মাত্রা সংযোজিত হয়েছে,

English

TITLE PAGE

COURSE NAME - TERM PAPER I
COURSE CODE - MAENGLC304

TERM PAPER ENTITLED

THE CONCEPT OF POST HUMANISM IN SELECT TALES OF Panchatantra

SUBMITTED BY ANTARA PARUI

ROLL NUMBER - 10322033310150 18
REG NUMBER - KNU103223310017

3RD SEMESTER
DEPARTMENT OF ENGLISH
(UG AND PG)
BIDHAN CHANDRA COLLEGE
KAZI NAZRUL UNIVERSITY
ASANSOL
2024

TITLE PAGE

COURSE NAME-TERM PAPER-I
COURSE CODE-MAENGLC304

TERM PAPER ENTITLED
A DETAILED STUDY OF MAIR NAIR'S *THE NAMESAKE*

SUBMITTED BY **POULAMI DASGUPTA**

ROLL NUMBER-10322033 31015026
REG NUMBER- KNU103223310025

3RD SEMESTER
DEPARTMENT OF ENGLISH
{UG AND PG}
BIDHAN CHANDRA COLLEGE
KAZI NAZRUL UNIVERSITY
ASANSOL 2024

Geography

NOTICE

It is hereby informed to all the students of 6th semester 2021-22 that Field Survey at Kunustoria Colliery area and Residential area will be held on 18.03.2024. All the students are asked to present at the spot by 8.00 A.M.

Dated- 14/03/2024

Coordinator of the Department
Geography Department
Bidhan Chandra College

We the under signed, students of Department of Geography, do hereby declared that we are willingly going to the departmental excursion at Ranchi on 24-09-2023 to 28-09-2023. We also declared that we will obey the rules and regulations of the college.

20/06/2024 11:57

पश्चिमबङ्ग पश्चिम बंगाल WEST BENGAL 84AB 276410

Sl. No.	Name of the Student	Signature	Guardian's phone
1	ANISH GHOSH	Anish Ghosh	8927484924
2	MD SAQUIB IQBAL ANSARI	md saquib iqbal ansari	6295350445
3	MRINMOY KUNDU	Mrinmoy Kundu	9832861092
4	PRADIP KUMAR KARMAKAR	Pradip Kumar Karmakar	9735179482
5	SWARNADEEP SAHA	Swarnadeep Saha	6295103699
6	ARNAB SARKHEL	Arnab Sarkhel	7797580014
7	SABYASACHI MONDAL	Sabyasachi mondal	9734789532
8	ANIRBAN DAS	Anirban Das	9733062421
9	KIRAN CHAND	Kiran chand	9046787873
10	SOUMEN GHOSH	Soumen Ghosh	9932651171
11	HEMANTA MURMU	Hemanta murmu	9732008379
12	AMARJEET SHAW	Amarjeet Shaw	9064450576
13	KRISHNENDU SENGUPTA	Krishnendu Sengupta	8617528203
14	ARIJIT MONDAL	Arijit Mondal	7679874553
15	PAPIYA DAS	Papiya Das	7098765476
16	Pratikhya Banerjee	Pratikhya Banerjee	9641728569
17	Sangita Barick	Sangita Barick	9832937280
18	RANI MAJI	Rani Maji	8637559050
19	SANA NAZIBA	Sana Naziba	8538805242

ক্রমিক নং 1554 তারিখ 6/9/23

পত্র- 10

নাম A Dey

ঠিকানা

স্বাক্ষর শ্রী

Sl. No.	Name of the student	Your Phone No.	Guardian's Phone No.
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21	SNIGDHA BHATTACHARYA		9734287478
22	Mousita Banerjee		9732162718
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24	Mausumi Murmu	Mousumi Murmu	9635320952
25	Sharmila Sonapasri		9564509481
26	Khushi Gond		8436774148
27			
28			

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Visit us: www.bccollegeasansol.ac.in; E. Mail: bccollege.office@gmail.com

CERTIFICATE FROM THE SUPERVISER

This is to certify that Miss Sana Naziba, Reg No-103211220040 has completed this project on "Mining as Human induced Disaster: A case study of Kunustoria Colliery" under my supervision for her 6th semester in Geography from Bidhan Chandra College, Asansol Under the Kazi Nazrul University.

It is also certified that the said Project has incorporated the result of the investigation made by Miss Sana. This work is based on both secondary and primary data.

Sougata Maji

Sougata Maji
Geography Department
Bidhan Chandra College

Principal,
Bidhan Chandra College,
Asansol, West Bengal,

Principal
Bidhan Chandra College
Asansol

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21/08/2024 13:40

BIDHAN CHANDRA COLLEGE

KAZINAZRULUNIVERSITY

B.SC 6TH SEMESTER

TOPIC:- MINING AS A HUMAN INDUCED DISASTER : A CASE STUDYOFKUNUSTURIACOLLERY

COURSE NAME:- **DISASTER MANAGEMENT PROJECT**

WORKCOURSECODE:-**BSCHGEOC602**

DISCIPLINE:- **B.SC IN GEOGRAPHY HONS.**

REGISTRATION NO – **103211220040**

ROLL NO- **1032106122018030**

SEMESTER:- **VI**

SESSION : - **2023-2024**

A CASE STUDY

OF

KUNUSTORIA COLLIERY SURVEY

DEPARTMENT OF GEOGRAPHY

BIDHAN CHANDRA COLLEGE

(ASANSOL)

ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my professor Mr. Sougata Maji who gave me the golden opportunity to do this assignment on "MINING AS A HUMANINDUCED DISASTER : A CASE STUDY OF KUNUSTURIA COLLERY".

Secondly I would like to express my special thanks to our principle Dr. Falguni Mukhopadhyay for providing me all the necessities.

CONTENT

MINING AS A HUMAN INDUCED DISASTER : A CASE STUDY OF KUNUSTURIA COLLERY

➢ ABSTRACT:

There are generally hazards associated with working in many industries. Mining industry has been always ranked among the ones that have the most dangerous working environments. Underground mining is a highly dangerous and hostile environment and there are several factors regarding this issue. It is, therefore, important to create a safe workplace that reduces these challenges so that mining can sustain. In this paper, the safety issues related to mining industry is discussed. Then, a risk matrix is developed to define the importance of these factors and their impact on the industry. Finally, the most important elements are explained and somesolutions to solve them are presented.

➢ INTRODUCTION :

Mining is a hazardous operation and consists of considerable environmental, health and safety risk to mine. Unsafe conditions in mines lead to a number of accidents are cause loss and injury to human lives, damage to property, interruption in production etc. But the hazards cannot be completely obliterated and thus there is a need to define and reckon with an accident risk le possible to be presented in either quantitative or qualitative way. Safety is paramount in the mining environment. The mining industry has for many years focused on injury prevention at the workplace through procedures and training, and has achieved considerable success. However, the statis on major accident events such as fatalities and reportable incidents has not shown the corresponding level improvement, In the area of major hazards control, the mining industry approach has emphasized mainly on p experiences and lessons learnt, while other high hazard industries such as the chemical process industry and o gas industry have taken system safety techniques to new highs.

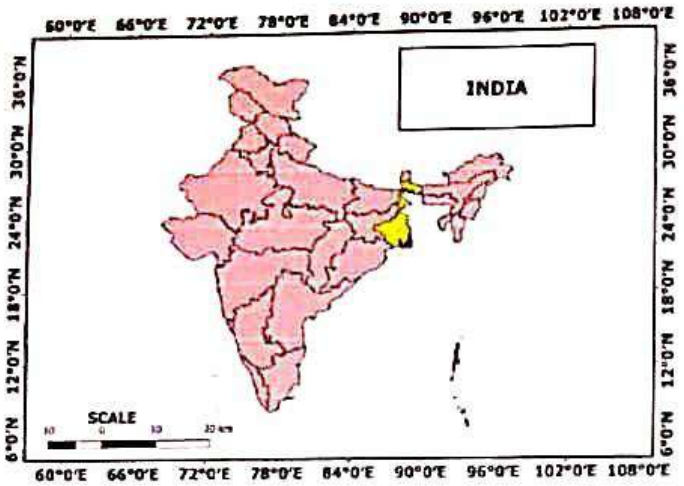
➢ STUDY AREA :

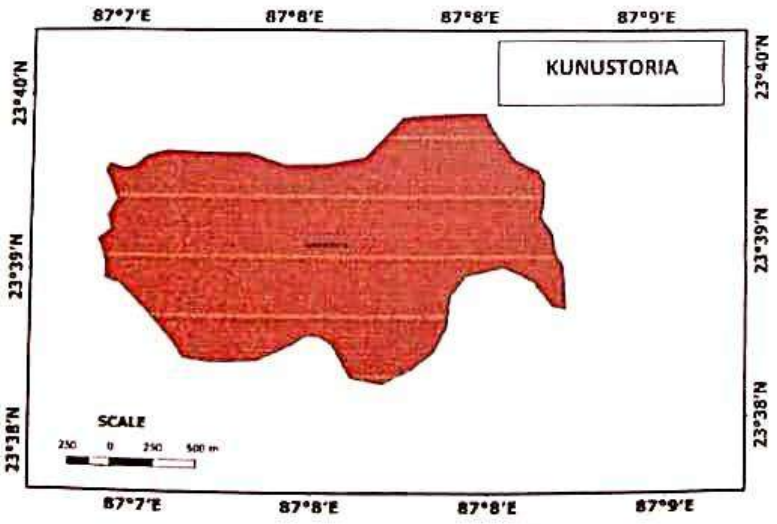
The Raniganj coalfield lies in the easternmost part of the Damodar Valley Coalfield and is bounded by 23°25'N to 23°50'N latitude and 86°38'E to 87°20'E longitude. It covers about 1,530 km² geographical area, spreading over the Burdwan, Birbhum, Bankura, and Purulia districts in West Bengal and Dhanbad district in Jharkhand. A network of roads and railway branches link the area with other part of the country (Fig. 1). The topography of the Raniganj coalfield is gently undulating and the elevation generally ranges from 65 to 75 m above sea level. The highest elevations are the Panchet (643 m) and Biharinath hills (451 m). The drainage pattern is mainly dendritic to sub-dentritic in nature (Srivastava and Mitra 1995) and most mines of this coalfield lies between two rivers, the Damodar and Ajay which flows almost parallel to each other. The area is a tropical region with fairly temperature variation.

The Raniganj coalfield is a part of the Gondwana Supergroup, which extends here over a rectangular area greater than 1,000 km². A full succession of lower Gondwana and younger rocks occurs, attaining a maximum thickness of more than 3,200 m. A large part of the coal- field is occupied by coal-bearing horizons of the Barakar and Raniganj Formations. A fluvio-lacustrine coal barren sequence known as the Iron Stone Shale separates these two coal-bearing horizons. The Panchet Formation (also barren of coal) overlies the Raniganj Formation, and comprises feldspathic sandstone and red clays.

The Raniganj coalfield is surrounded by Archaean rocks on all sides except in the east, where its boundary is not clear, as it is covered by alluvium. The dip of the strata is generally southerly; the oldest rocks are exposed along the northern margin, and successively younger strata outcrop towards the south. The northern margin represents the normal depositional boundary between the basal Gondwana and the basement Archaeans while the western and southern boundaries are faulted.

KUNUSTORIA COLLIERY





➢ Objectives of Studying Mining as a Human-Induced Disaster:

1. Understanding Environmental Impacts.

2.Assessing Health and Safety Risks.

3.Evaluating Socio-Economic Consequences.

4.Promoting Sustainable Practices.

6.Policy and Governance.

7.Sustainable Solutions.

➢ METHODOLOGY :

The method used in this research to evaluate and analyse the risk of a coal mine was quantitative method. Quantitative risk matrix is increasingly applied in the mining and minerals industry due to business requirements to support financial decisions, evenly compare financial risks with environmental and social risks, and to demonstrate transparency, consistency and logic of approach. However quantitative risk matrix approaches often are not intuitive and require some up-front learning investment by decision makers.

In his article 'What's Wrong with Risk Matrices? Tony Cox argues that risk matrices experience several problematic mathematical features making it harder to assess risks. These are:-

a. **Poor Resolution:** Typical risk matrices can correctly and unambiguously compare only a small fraction (e.g., less than 10%) of randomly selected pairs of hazards. They can assign identical ratings to quantitatively very different risks ("range compression").

b. **Errors:** Risk matrices can mistakenly assign higher qualitative ratings to quantitatively smaller risks. For
risks with negatively correlated frequencies and severities, they can be "worse than useless," leading to worse-than-random decisions.

c. **Suboptimal Resource Allocation:** Effective allocation of resources to risk-reducing counter measures cannot be based on the categories provided by risk matrices.

d. **Ambiguous Inputs and Outputs:** Categorizations of severity cannot be made objectively for uncertain consequences. Inputs to risk matrices (e.g., frequency and severity categorizations) and resulting outputs (i.e., risk ratings) require subjective interpretation, and different users may obtain opposite ratings of the same quantitative risks. These limitations suggest that risk matrices should be used with caution, and only with careful explanations of embedded judgments. (Mutekede, 2014).

➢ TYPES OF HAZARDS ASSOCIATED WITH MINING :

On the basis of different hazard associated with mining these can be differentiated into two major categories, which are as follows:-

❖ PHYSICAL PROBLEMS:-

Coal mining is associated with a range of physical problems that impact both miners and the surrounding environment. Here are some of the primary issues: Health Risks for Miners

1. Respiratory Diseases:

- Coal Workers' Pneumoconiosis (CWP)*: Also known as black lung disease, this condition is caused by long-term inhalation of coal dust, leading to lung damage.
- Silicosis*: This occurs due to inhaling silica dust, which can be present in mining environments.
- Chronic Obstructive Pulmonary Disease (COPD)*: Long-term exposure to dust can lead to chronic bronchitis and emphysema.

2. **Hearing Loss:** Prolonged exposure to the high noise levels from mining equipment can cause hearing damage.

3. **Musculoskeletal Disorders:** The physical demands of mining, such as lifting, carrying, and operating heavy machinery, can lead to back injuries, joint problems, and other musculoskeletal issues.

4. **Traumatic Injuries:** Miners face risks from cave-ins, explosions, machinery accidents, and falls, leading to severe injuries or fatalities.

❖ ENVIRONMENTAL AND COMMUNITY HEALTH PROBLEMS:

1. **Water Contamination**: Mining activities can lead to the contamination of water sources with heavy metals, acid mine drainage, and other pollutants, impacting drinking water and aquatic ecosystems.

2. **Air Pollution:** The release of coal dust and other particulates into the air can affect the respiratory health of communities near mining sites.

3. **Land Subsidence:** The collapse of land over mined areas can damage infrastructure, homes, and natural landscapes.

❖ Environmental Impacts:

1. **Habitat Destruction:** The removal of large areas of land for mining disrupts habitats and can lead to the loss of biodiversity.

2. **Greenhouse Gas Emissions:** Coal mining and combustion are major sources of carbon dioxide (CO_2) and methane (CH_4), contributing significantly to global warming and climate change.

3. **Waste Management:** The extraction process generates large amounts of waste rock and tailings, which need to be managed to avoid environmental contamination.

Addressing these problems requires stringent safety regulations, environmental protections, and ongoing health monitoring for workers. Efforts to reduce coal dependency and transition to cleaner energy sources are also critical in mitigating these issues.

➢ RESULTS AND DISCUSSION:

From the data collected from the direct survey at Kunustoria Mining Area office the followed Graphical representation of the primary data has been represented along with the discussion. That will help us to know about the problems faced by the local residents of that area that how coal mining effects their daily life.

(Fig.1)

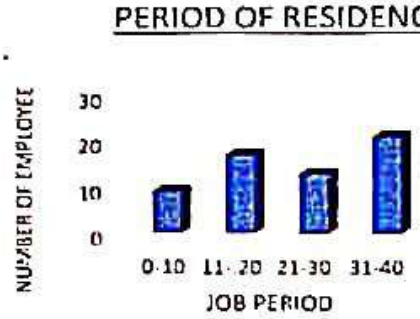
From the above graphical representation it can be esiliy observed that the maximum residents and employee of the Kunustoria mining area is belongs to the age group of 51-60 yrs including the under -ground miners. Whereas the lowest age group belongs to that area is 20-30yrs who the mainly the family members of the employed persons.

From the survey it has also been observed that the population male and female is fairly distributed in that area but most of the mining activities are done by the male population ,whereas the females are mostly engaged in normal office errands. The working sex ratio of male and females are represented in (fig.2). most of the working persons are engaged in underground mining activates which quite dangerous work even there is safety measures provided by the coal mining authority like shoes, helmets, and lights, hospital facilities, but even though there is chance of being stuck in underground due to blasting and land slides.there are also some surface and other works which are conducted in above the ground surface. But even the surface workers have to suffer from the hazardous impacts of mining activites .(fig.3).

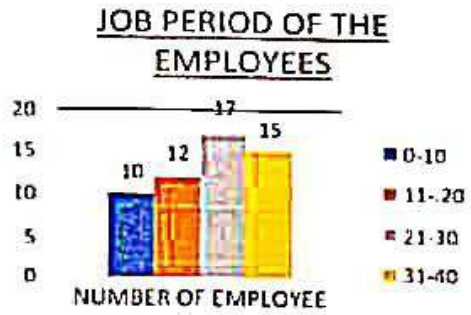
(Fig.2)

(Fig.3)

The hazardous effect of coal mining can be best observed by the long term residents of that area.as per result of the kunustoria survey the most of the surveyed person residing for 31-40yrs (fig.4)of and served ECL for around 21-30yrs (fig.5) whom many persons weather it could be themselves or their family member suffering from many coal mining induced diseases like heart issues, dust allergy, cough, headache, asthma, high Bp (due to blasting).whereas the underground miners also have to go through several disease due to they have to face some toxic gases in the underground mining gas chambers.

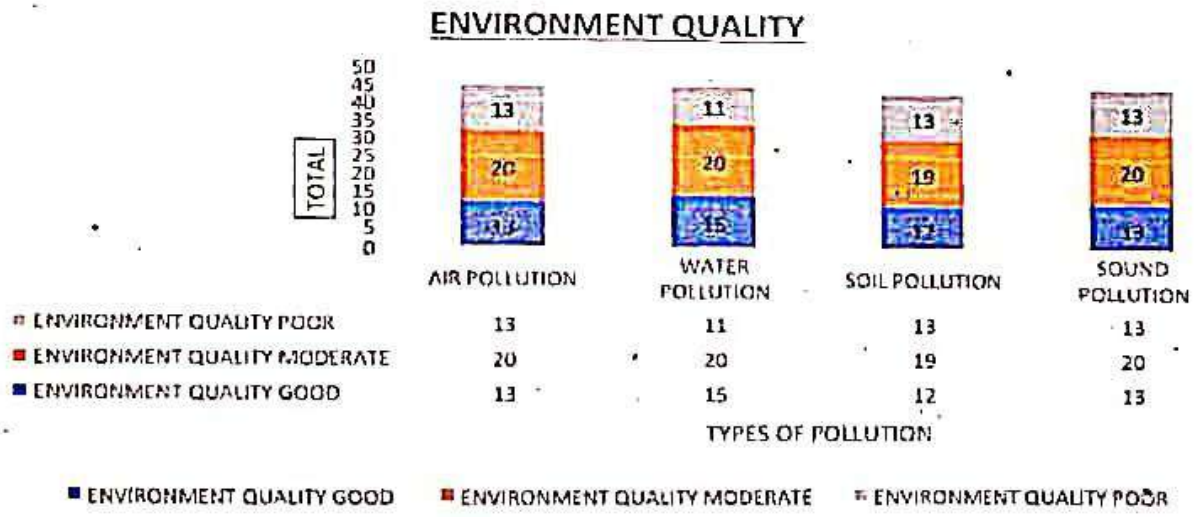


(Fig.4)



(Fig.5)

Coal mining not onlyimpacts the humans daily life but also the environment which again impacts human life directly. coal mining effects nature in various by degrading the of air weather it is underground or opencast mining by releasing many toxic gases, land and soil degradation by blasting in the mines, mining activities also impacts the surrounding water bodies by polluting them and in many other ways this mining activities impacts the surround nature and as well as the ecosystem of that area in and hazardous way. Regarding this bad impacts of mining a graphical representation of



that surveyed data collected from Kunustoria can has been represented in fig.6.

Fig.6

◆Mitigation and Management Strategies:

To address the adverse impacts of mining at Kunustoria, several strategies can be implemented.

1. **Environmental Management:** Implementing stringent environmental regulations to control pollution, managing waste, and reclaiming mined land can mitigate environmental impacts. Regular monitoring and enforcement of standards are crucial.

2**. Health and Safety**

Measures: Improving working conditions, providing proper safety equipment, and conducting regular health check-ups can reduce health risks. Training programs for workers on safety practices and emergency response are essential.

3. **Community Engagement:** Involving local communities in decision- making processes and ensuring fair compensation and rehabilitation for displaced families can help alleviate socio-economic tensions. Transparent communication and corporate social responsibility initiatives can build trust and cooperation between mining companies and local residents.

➢ CONCLUSION:-

The study of mining in Kunustoria highlights the dual nature of coal mining as both an economic driver and a source of significant human-induced disaster. Addressing the environmental, health, and socio-economic impacts requires a balanced approach that includes sustainable mining practices, robust regulatory frameworks, and active community engagement. By implementing these strategies, it is possible to mitigate the negative effects of mining and promote a more sustainable and equitable development path for the region.The insights gained from Kunustoria can serve as a valuable reference for other mining regions facing similar challenges, emphasizing the importance of holistic and integrated approaches to managing natural resources responsibly.

BBA

Government Accounting & Financial System of Indian Railways

PROJECT REPORT

Submitted by

SYED AMAN KABIR

Registration Number: - 103211280056

Under the guidance of

PROF. SANTANU MAZUMDAR

&

PROF. KAJAL GOSWAMI

in partial fulfilment of the requirements

for the award of the Degree of

BACHALOR OF BUSINESS ADMINISTRATION

of

KAZI NAZRUL UNIVERSITY

Department: - Bachelor Of Business Administration

College: - Bidhan Chandra College

Submitted on: - May,2024

ACKNOWLEDGEMENT

I am overwhelmed in all humbleness and gratefulness to acknowledge all those who have helped me to put the ideas, well above the level of simplicity and into something concrete. I owe a great debt to my guide Prof. Santanu Majumdar and Prof. Kajal Goswami who provided wholesome direction and support to me at every stage of this work. There wisdom, knowledge and commitment to the highest standards inspired and motivated me.

Syed Aman Kabir

DECLARATION

I hereby declare that the project titled "**Government Accounting & Financial System of Indian Railways**" is an original piece of research work carried out by me under the guidance of Prof. Santanu Majumdar and Prof. Kajal Goswami the information has been collected form genuine and authentic sources. The work has been submitted in practical fulfilment of the requirement of degree of Bachelor of Business Administration to university of Asansol.

Date: 03/05/2024 Syed Amn Kabir

Place: Asansol

Eastern Railway

Accounts Department/Asansol

(CERTIFICATE)

It is certified that **Syed Aman Kabir** (Roll No : 103211280056), student of **BBA** of Bidhan Chandra College, Asansol has been imparted internship at the Office of the Sr.Divisional Finance Manager, Eastern Railway, Asansol (W.B) from 19/06/23 to 14/07/23.

During the session the student has undergone training in Government Accounting and financial System of Indian Railways especially IT based working system of Railways.

I wish her all success in life.

Place : Asansol
Date : 03/08/2023

4/8/23

Asstt. Divisional Finance Manager/II
Eastern Railway ,Asansol

Asstt. Divisional Finance Manager (II)
Eastern Railway / Asansol
सहा मंडलवित्त प्रबंधक (II)
पू रे आसनसोल

Office of the Sr. Divl. Finance Manager
E. Rly, Asansol

Table of Contents

IPAS application software (the software for AIMS) has been developed by CRIS on web based 3-tier centralized architecture using Java and Oracle. It will bring a common application to all Railways on a centralized platform so that similar processes are followed across Railways in terms of accounting practices. A key benefit of such centralization would be faster change management and integration of effort along with automation of processes. IPAS application is undergoing a continuous up-gradation exercise to achieve better efficiency, security and safety. IPAS will provide real time access to financial transaction data across IR and will also bring financial and fiscal discipline.

Chapter 2: Advantages of IPAS

Although core design of IPAS application is same as design of PRIME/AFRES, following improvements have been done by CRIS:-

A. Technology Level:

i) Centralized Architecture ii) Web based Application. It doesn't require any client software on end-users' PCs.

iii) Designed and developed using state of the art open Java technology. As the programs are developed in Java, it can run on any Operating System, any Application Server (i.e. of any company product) and any hardware.

iv) Java is futuristic technology specially designed for web based application as compared to existing Oracle Forms based technology of PRIME/AFRES which has become obsolete.

v) High Availability (24*7) as all the servers have been clustered to run in fail-over mode. Thus, if there is failure of any server, the load will be shifted to cluster server immediately and under no circumstances work will be interrupted. The users would not know the breakdown.

vi) Load Balancing through Hardware Load Balancers to balance the loads on HTTP Servers.

vii) Centralized maintenance and management of Infrastructure (Application Software, Hardware & Systems Software).

viii) Disaster Recovery of critical applications such as IPAS/AIMS is essential. Being Centralized Architecture, it is easy to replicate data as well as switching of sites from Data Centre (DC) to Disaster Recovery (DR) and vice versa.

B. Security Level:

i) Secured Socket Layer (SSL) software has been enabled to encrypt the data so that any transaction of IPAS including passwords of users can not be hacked by hackers.

ii) Role based access to the end users which can be administered by Administrators nominated at each unit. Provision for security of each screen/report is available in IPAS.

iii) Audit trails to monitor the changes made by any user including Administrators.

iv) Credentials of users are stored in encrypted way, which can not be decrypted by any algorithm.

v) No access of database has been given to anyone for security reasons. For running adhoc queries, a utility has been provided by CRIS to extract the data, as per requirement, by writing Oracle SQL queries.

C. Trust Level:

i) IPAS has been developed entirely In-house by CRIS using its own team of software professionals. Similar to other IR Application such as PRS, FOIS, UTS, CMS, COA etc, the complete knowledge base of the application is with CRIS and in any case, Railways need not be dependent upon outside IT companies for the Software Maintenance.

With the involvement of Railways' own EDP centre staff, IPAS can be rolled over rapidly in all the Zonal Railways.

ii) Source code of IPAS is the property of Railways and therefore in long run, there is no issue of Intellectual Property Right (IPR).

D. Database level:

i) PRIME And AFRES databases have been merged into single database and all the redundant tables have been dropped. ii)Few tables have been merged for storing similar data (e.g. Tables for Current & continuous Allowances/Recoveries)

iii) Processes written in Pro*C (e.g. Salary Processing, Income Tax etc.) have been converted into Oracle Stored Procedure for performance enhancement.

E. Application Level:

i) Inter-related data capturing screens have been merged into single screen to reduce navigations. (eg. GIS/PF/Gratuity have been given through single screen; change card entries have been merged into single screen). This makes the work easier for the bill clerks.

ii) No Pay Rates form for entry of Basic Pay, DA, HRA and Transport Allow. While processing of salary, data for Basic Pay, HRA, and Transport Allowance are fetched from Employees' Bio-data.

iii) Steps for salary processing have been merged to reduce the work of end-users.

iv) The salary and income tax processing to be done by respective bill clerks.

v) Salary Bill passing screen has enriched functionality now. The screen compares allowances/recoveries/allocations with that of previous month for individual employee to check. In addition, variations are shown in red colour. Moreover, the user has been provided all the information required for passing the salary bill.

vi) Format of Numbers like CO6, CO7, PPO have been changed to maintain uniqueness at Zone/IR level.

vii) All the interrelated modules are integrated.

PF deductions/Loan recoveries through regular/ supplementary salary are credited in the employees' respective ledger as soon as Abstract is prepared. PF withdrawals are also automatically debited along with automatic start of recovery from next month.

Deposit of PF through MCR is linked with PF module.

Cash authorisation under Budget Module is linked with Internal Check. Bill passing has been linked with Agreement

viii) Where-ever possible, data during entry has been validated as per extant rules e.g. Nursing Allowances can be given to Nursing category only. ix)No duplication of PF data between Personnel and Accounts department. PF application can be processed on-line by Personnel department.

x) Posting of Transfer inwards and outwards (Divisional): As the records of PF ledger accounts are maintained in a single database for entire Zonal Railway, maintenance of transfer inwards and outwards (divisional) does not require any separate transaction. The issuing division changes Bill unit only as and when any employee transferred and the receiving units get the data automatically and they need to confirm the data by entering JV number. This is secure data with in-built checks and least manual intervention

F. Interface with Other Applications:

i) Traffic Account Module can be linked with PRS/FOIS/UTS for earnings. Apportionment of earnings may be made part of Traffic Accounts.

ii) IPAS has integration with Material Management Information System (MMIS). As both the systems are interfaced, Stores bills are passed through MMIS and the cheques are issued through IPAS.

iii) Design of Works Register is compatible with IRPSM (Indian Railways Projects Sanctions and Management). Once implemented on Centralized architecture, expenditure as available in Works Register of IPAS against each work will be reflected in IRPSM. Similarly, Budget Outlay allotted through IRPSM will be linked to Works Register.

iv) Design of Budget Module is compatible with RBCS (Rail Budget Compilation System) of Budget Directorate. IPAS once implemented in Centralized architecture, RBCS can be linked with Budget Module of IPAS for August Review, RE/BE & FM. Similarly, Budget allotted under Revenue Demands through RBCS will be linked to Budget Module.

v) IPAS is being integrated with Crew Management System (CMS) for allowances of running staff.

All the above applications have been designed, developed and implemented on centralized architecture by CRIS and are hosted in CRIS Data Centre.

G. Other:

i) As application is based on Centralised Architecture, Real Time Information of IR level can be provided to Board. ii)Being a uniform application similar to any other IR applications (eg PRS, FOIS etc.), all the business rules and report formats are uniform over IR. Compliance of any rules/circular of Board (such as DA Arrear, Bonus etc.) can be made speedily.

iii) Easy monitoring and control by Board in line with PRS/FOIS.

iv) LPC may be redundant. Transfer of employees from one unit to another would not require physical movement of his service data (service card, LPC, leave etc) and financial data (PF, loans etc) in order to enable the new Unit to access his data. Mere change of Bill Unit of the employee would enable the new Unit to access his entire data viz. PF, Loans, leave, service details etc. before the physical communication is made. There is no need for fresh entry of data by the new unit for previous months.

Chapter 3: IPAS Modules & Architecture

AIMS Portal

AIMS Portal is accessible through Internet using URL:-

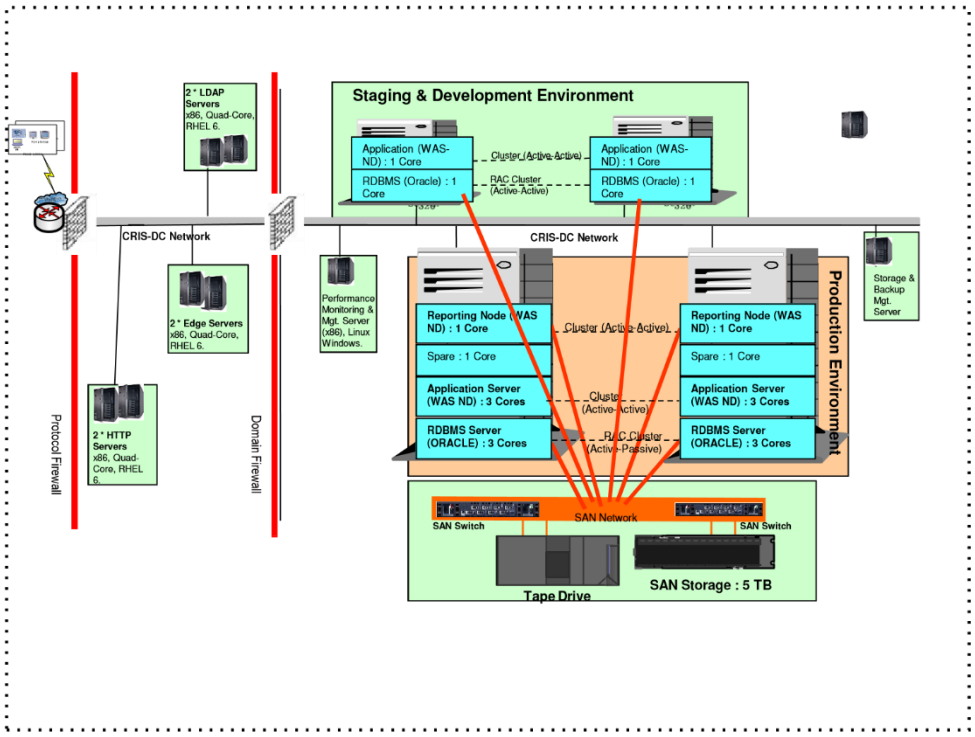
https://aims.indianrailways.gov.in

It consists of 2 Applications

Integrated Payroll & Accounting System (IPAS)

Employee Self Service (ESS); where every employee can view details of his/her Salary, Income Tax, PF Ledger etc.

Architecture



Application Server: IBM WebSphere Application Server (Network Deployment)

Database Server: Oracle 11g Enterprise Edition with Real Application Cluster (RAC)

Development Language: Java

Functional Modules

Payroll

- → Employee Profile
- → Payroll
  - ➢ Salary, Allowances & Recoveries
  - ➢ Annual Increments
  - ➢ Income Tax
  - ➢ Bonus, Cash Compensation
  - ➢ DA Arrear
  - ➢ Supplementary Bills, Traveling Allowance
- → Leave
- → Settlement
  - ➢ Leave Salary
  - ➢ GIS
  - ➢ DCRG
- → Quarters
- → Electricity
- → Cadre (Book of Sanction)
- → Workshop Incentive
- → Loans & Advances

Accounts

- ➢ Internal Check
- ➢ Books
- ➢ PF
- ➢ NPS
- ➢ Pension
- ➢ Cash & Pay
- ➢ Suspense
- ➢ Budget

Chapter 4: IPAS Implementation

Strategy

A. Nominations:

1. One Nodal Coordinator who will act as interface between CRIS and Railway.
2. A core team to be formed at each unit. This core team will be trained by CRIS who will act as interface with CRIS technical team and end-users to resolve day to day issues during implementation.
3. Administrators in each accounting unit to manage IPAS including user management and their permissions.

B. Operations:-

1. Payments of Salary should be made in Single Pay Cycle. IPAS prepares salary for the full month i.e. from 1st Day of month to Last day of Month. However abstract/payment may be made on any date.

C. Site Preparation

Railway will ensure availability of following Infrastructure at each Accounting Unit:-

1. Desktop PCs with Internet Explorer (7.0 or higher)
2. Internet Connectivity as IPAS is based on Internet. Bandwidth requirement has to be calculated @200 Kbps per concurrent user. Number of concurrent users is to be estimated by Railways.
3. i) Line Printer for printing of Salary Reports ii) Cheque Printer to print Cheques iii)Passbook printer for printing of PF passbook iv)Inkjet/Laser/Dot Matrix Printer as required by unit for printing of various reports v)Requisite Stationary (80 Col/132 col./A4 Size Paper) for Reports

D. Data Preparation

Zonal Railway has to migrate legacy data of Nov 2015 salary from their existing systems to IPAS Tables for all its accounting Unit. For this, IPAS blank Tables have been provided in the form of Oracle dump which has been generated through "export" utility of Oracle. This dump (IPAS_Blank.dmp) can be downloaded from "Documents" section of AIMS portal and imported into a separate schema (Oracle user say IPAS) of any local level Oracle installation. To make the version compatibility, dump has been created using lower version of Oracle i.e. 8i, so that it can be imported in any higher version of Oracle also. Care has to be taken while data porting into IPAS tables as Master Codes (e.g. Department Code, Designation Code, Earning/Deduction Code etc.) referred in IPAS are different than used in legacy systems. The mapping of such codes (IPAS vis-à-vis PRIME) will be useful before data migration. The following steps may be taken for data preparation activity:-

1. Standardisation of Bill Units :- All the Bill units to be standardized. Bill units are 7 digit numeric. Initial 4 digits are the same as Accounting Unit codes allotted to the unit.
2. Duplicate Employee No to be set right in the perspective of entire Indian Railway. It has been observed that Employee Numbers are unique within an Accounting Unit but it is not unique at Zonal/IR level. To make Employee Numbers Unique for IR, predefined 3 digits are to be prefixed to existing Employee Numbers. This will make Employee Number of 11 digits, which will be unique at IR Level.
3. Standardisation of Master Codes (Designation, Earning/Deduction, Suspense Allocation, Bank, Station, Department) and its mapping with IPAS Codes. Codes for Designation and Earning/Deduction have been Standardised. Suspense Allocations have been standardized as per Board's letter No 2008/ACI/6/2/Meeting dated 29/04/2011 issued during implementation of e-Recon. List of Standard Banks has been taken from RBI website. IFSC code of the bank has been used as Bank Code. As Non Railway Body Recoveries are local to each Railway, codes for these should be allotted by Zonal Railways for all its Accounting Units.

4. Migration of current Data (Employee Data, Allowances/Recovery/Loan, Leave balances etc.) into Blank tables of Oracle database to initiate Salary Bill Preparation and Passing.
5. Verification of Migrated Data to ensure that data prepared is as per IPAS requirement.

   This verified is to be mailed to CRIS for porting to Production database of IPAS. In case the size of dump (.dmp) file is too large to be mailed, it can be shared through cloud storage (such as Google Drive or Dropbox). The .dmp file is an export version of schema (Oracle user say IPAS) which was created for importing Blank dump file.

E. Data Porting

Data as sent by Zonal Railway for all its Accounting Unit will be verified by CRIS. It will be ported to Production Environment if it as per requirement. In case of any deficiency, Railway will be asked to correct and resend it.

F. Define Users

1. CRIS will create UserIds for Administrators of Zonal Railway as well as for each Accounting Unit. UserId for Zonal Administrator will be activated by CRIS. Remaining IDs can be activated by him/her.
2. Administrators in each Accounting unit will create User-Ids for end-users. They will also assign Permissions for Module/Bill Units/Sections to the end-users.

G. Training

1. Training will be provided by CRIS to trainers/core team of the unit. Training to end users will be imparted by respective core team.

H. Parallel Runs

1. Parallel runs will be made by end-users with the help of core team at each unit. Core team at unit will interact with CRIS technical team (through e-Mail/ Telephone) to resolve day to day issues observed during trial runs. Parallel runs will help users to learn IPAS and test the rules for allowances/ recoveries. It will also help to ensure correctness of data.

I. Live Run

1. Payroll to be made live for March 2016 salary (Paid in April 2016). It will cover :-
   i) Salary Bill preparation ii) Salary Bill Passing
   iii) Abstract Preparation and Cheque Printing for Salary iv) Cash Book preparation
2. Internal Check, PF, Settlement, JV, MCR, Books including Account Current , Works Register, Cash & Pay, Suspense, Budget etc. will be made live subsequent to Payroll.

Schedule

Sr. No.	Activity	Target Date	Responsibility	
			CRIS	Railway
1	Nomination of IPAS implementation team and Nodal Co-ordinator			
2	Training of IPAS (including Data Preparation and Administration) to IPAS Implementation team			
3	Verification of Accounting Unit List and provide Information as per Questionnaire sent by CRIS	30th Nov 23		
Month 1 & Month 2(e.g. 1/11/2023 to 31/12/2023):				
1	Finalisation of Master Data:- i) Non-Railway Body (NRB) Recoveries ii) Allowances/Recoveries other than NRB iii) Designation	5th Dec 23		
2	Data Preparation for 11 Tables (Bill unit, Station, NRB Recovery, Employee, Rule based allowances, Monthly/Continuous Allowances, Loan, Employee Allocation if it is different from Allocation of Bill Unit, Absentee Details) as per Latest available Salary Data e.g. Nov 2015 Salary. Data to be ported in Tables (PRMAGRP, PRMASHOP, PRMASTN, PRMAEED_NRB, PRMAEMP, PRMAPRA, PRMAMED, PRMALOAN & PRMAEMPALC, PRTRLVD) of blank dump provided for the purpose. Good Quality Data needs to be provided by Railway after ensuring compliance of check-list.	10th Dec 23		
3	Data porting in Production Environment and processing of Salary through IPAS	14th Dec 23		
4	Creation for Administrative User-Ids and Activation of User-Id of Zonal Administrator (Nodal Officer) & Zonal Administrator (IT team).	14th Dec 23		
4	User Creation and Granting of Roles			
5	Extraction of salary data generated through IPAS Salary process and its comparison with the salary data generated through PRIME. Appropriate action to be taken based on variations observed and extant rules			
6	Generation of Salary Bill Reports and distribution of printed Salary Reports for verification by Bill Clerks			
7	Training to end users on Salary Bill Preparation and Passing			
8	Trial/Parallel run of respective Salary Bills by end users, Correction of data in IPAS, cross checking of Salary Bill (PRIME & IPAS) and Passing by Accounts officials			
9	Data Preparation for remaining entities (Spending Unit, PF Ledger, Party Master, Works, Estimates, PO, Agreement etc.)			
10	User Creation and Granting of Roles for Internal Check, PF, Pension, Settlement, Loan , Abstract Preparation and Cheque Printing			
Month 3 (e.g. Jan 2024)				
1	Parallel run of Payroll by end-users for Dec 2023 & Jan 2024 Salary			
2	Training of Internal Check, PF, Pension, Settlement, Loan , Abstract Preparation and Cheque Printing .			
Month 4 (e.g. Feb 2024)				

1	Parallel run of Payroll by end-users			
2	Trial/Parallel run of Internal Check, PF, Pension, Settlement, Loan ,			
	Abstract Preparation and Cheque Printing by end-users			
Month 5 (e.g. March 2024)				
1	Live run of Salary Bill Preparation and Passing			
2	Parallel run of Internal Check, PF, Pension, Settlement, Loan , Abstract Preparation and Cheque Printing by end users			
Month 6 (e.g. 1st April 2024)				
1	Live run of Internal Check, Abstract Preparation/Cheque Printing, PF, Pension, Settlement, Loan			
2	Preparation of data for 4 entities viz. taxable salary data for Income Tax , Savings for Income Tax Rebate, Leave (LAP/LHAP) Balances, Financial Transaction Data for Account Current*			
3	Porting of Income Tax, Savings and Financial Transaction Data*			
Month 7 (e.g. 1/5/2024):				
1	Live run of Cash Book, JV			
2	Preparation of Treasuries in each station for Cash (Shroff) Module			
3	User Creation and Granting of Roles for Suspense, Cheque Reconciliation, RIB Reconciliation, Cash & Pay, Quarters & Electricity			
5	Training on Books (e-Recon, Trial Balance, Account Current etc.)			
6	Training on Suspense (Establishment & General both) Modules			
7	Porting of data related to Treasuries in each station for Cash (Shroff) Module			
8	Training on Cash (Station Earnings & MCR)& Pay Modules			
9	Training on Cheque Reconciliation & RIB Reconciliation			
10	Training on Quarters & Electricity Module Reconciliation			
Month 8 (e.g. 1/6/2024):				
1	Preparation of Historical Data for E-Suspense, General Suspense, Outstanding Cheques, Salary, Works, Estimates Quarters, Meters Data, Formula & Rates for calculating Electricity Charges			
2	Porting of above data			
3	Trial run of Suspense, Cash & Pay, Cheque Reconciliation, RIB Reconciliation, Quarters, Electricity, Budget			
Month 9 (e.g. 1/7/2024):				
1	Live run of Suspense, Cash & Pay, Cheque Reconciliation, RIB Reconciliation, Quarters, Electricity and Budget Modules of IPAS			

* Month 6 (Activity 2 &3) i.e. Data Porting for Income Tax will not be required if Payroll is implemented for March paid in April. Similarly, Data Porting for Financial Transactions will not be required if all other payments are implemented from 1st April.

Checklist

Preparatory

Sr. No.	Item	Remarks	Comments by Unit
1	The unit has adopted single batch payment.		
2	Nomination of Nodal Officer along with implementation team has been identified.	Format 3	

Infrastructure

Sr. No.	Description	Yes/No	Comments by Unit
1	All the users have Desktop PCs to work on IPAS		
2	The PCs have Internet Explorer (IE) 7.0 or higher installed. Internet Explorer is free and if old version of IE is running, the same can be upgraded through Internet or System Integrator.		
3	PCs have Internet Connectivity and IPAS is accessible through it. URL of IPAS is https://aims.indianrailways.gov.in/IPAS Internet Bandwidth requirement has to be calculated @200 Kbps per concurrent user.		
4	The unit where IPAS is being planned have sufficient Line printers for printing of salary Bills.		
5	The unit has Cheque Printer to print Cheques		
6	The unit has Passbook printer for printing of PF passbook		
7	The unit has Inkjet/Laser Printer as required by unit for printing of various reports		
8	The unit has sufficient stationary for salary report printing. The stationary should NOT be pre-printed as salary bills are printed on 132 column Normal stationary.		

Data Migration

Sr. No.	Item	Remarks	Comments by Unit
1	Uniqueness of PF Numbers has been verified for entire Zone.		
2	Master Code has been verified and found to be OK/variations have been apprised to CRIS	Annexure 1 & 2	
3	Mapping for selected Tables has been completed and no code is left unmatched.	Under Para - MasterCode	

		Mapping	
4	Data has been provided in IPAS structure and has been validated for its accuracy before sending it to CRIS.	Under para - DataPorting and Data Validation	

Implementation

Sr. No.	Item	Remarks	Comments by Unit
1	Data has been validated and found to be OK by CRIS		
2	End-Users are trained and core team is ready for implementation		
3	Cheque printing has been tested and report/data for sending to Bank for payment is OK.		
4	Formats of all the reports (Account Current, Ledger, Journal, Schedules, RAR) have been verified		

Chapter 5: Data Migration

Uniqueness of Employee No:- Railways are being advised to ensure uniqueness of Employee Number in their Railways before initiating implementation of IPAS . Currently PF numbers for employees under PF scheme and a system generated no for employees under NPS scheme are being used as Employee No. However, Employee number may be non-unique in entire IR in-spite of being unique in individual Railways. Railway Board has already allotted RUID to each employee. Employee Self Service Portal is currently accessible through RUID. Employees can view details of their Salary, PF, Income Tax etc. themselves through this portal. IPAS has provision to store both Aadhar and RUID for each employee.

To ensure uniqueness of Employee Numbers at IR level, each Accounting unit has been allotted a 3 digit code (Refer Accounting Units list at Annexure-1). These are to be prefixed with existing 8 digit employee number. It will make employee number of 11 digits, which will be unique at IR level.

Mandatory Employee Attributes: - The following Mandatory Fields must be set in the employee data.

i. Employee No

ii. Employee Name

iii. Date of Birth

iv. Sex

v. Saving Scheme

vi. PRAN No. (12 digit number for NPS Cases)

vii. Designation

viii. Grade Pay

ix. Pay band

x. Pay Rate (Basic + Grade Pay)

xi. Increment Date

xii. Pay Category (Gazetted/Non-Gazetted)

xiii. Department xiv. Bill unit no

xv. Station

xvi. Payment mode (Cash,NEFT,RTGS……)

xvii. Bank code (mandatory for payment other than Cash)

xviii. Account no (mandatory for payment other than Cash)

xix. PAN

xx. Date of Appointment

xxi. Service Status (Serving, retired etc…..)

xxii. Mode of Transport Allowance

xxiii. Mode of Accommodation

xxiv. If physically Handicapped……Y/N (As transport Allowance varies)

xxv. Employee Status (Apprentice, permanent etc…)

Challenges during Data Preparation

1. Uniqueness of Employee Numbers:- prefixing 3 digit allotted code with existing 8 digit employee number will ensure uniqueness of Employee Number at IR level.
2. Missing Date of Birth:- In case DOB is not available,'29-02-1976' may be used to avoid delay in data preparation. However, the same MUST be corrected by Accounting Units using "Data Correction" option in IPAS before system is made LIVE.
3. Missing Appointment Date:- In case Appointment Date/Railway Joining Date is not available, '15-08-2000' (PF scheme) or '15-08-2004' (NPS scheme) may be used to avoid delay in data preparation. However, the same MUST be corrected by Accounting Units using "Data Correction" option in IPAS before system is made LIVE.
4. Saving Scheme:- use '1', if employee is under PF contribution scheme. Use '2', if employee is under NPS scheme. Use '3' if employee is neither in PF nor NPS (such as Apprentice).
5. Handicap :- Transport Allowance is dependent upon "HANDICAPFLAG" and "HANDICAPCODE". It has been observed that in PRIME, 'E0060' code has been used for Transport Allowance (Handicapped).
   In IPAS, Code for Transport Allowance for both (General and Handicapped) are same, but based on value in "HANDICAPFLAG" and "HANDICAPCODE" system decides whether employee is handicapped and TPA is calculated double.
   For TPA to Handicapped, value in "HANDICAPFLAG" should be "Y" and "HANDICAPCODE" should be one of following:-
   1-Blind,
   2- Orthopedic with disability of lower extremist
   4- Deaf and Dump
   3- Other

   Railways should ensure to provide correct values for these attributes ("HANDICAPFLAG" and "HANDICAPCODE") in PRMAEMP table so that handicapped employees are paid correct TPA.

6. Mode of Transport Allowance:- Transport Allowances are given in IPAS as per record set in Payrate table as well as value of Transport Mode set in PRMAEMP. Possible values in "TRANSPORTMODE" attribute of PRMAEMP table are as below:-
   1- None of the below
   2- Declaration from Employee
   3- RC Pass
   4-Office Transport
   5-Office Transport Not Availing
   In case of value '1','3' and '4', employee is not given TPA. In case of value '5' and employee is in Gazetted category, he/she is given fixed Rs. 7000/- towards TPA.
7. Mode of Accommodation:- HRA is given to employee based on record set in Payrate table as well as value of Accommodation Mode set in PRMAEMP. Possible values in "ACCMOMODE" attribute of PRMAEMP table are as below:-
   1-Railway Quarter
   2-Lease
   3-HRA
   4-Quarter and HRA
   HRA is given to employee only if value is set as '3' or '4'.
8. Designation:- Only those designations are to be mapped with IPAS designation code, which are being used in Employee Data (PRMAEMP). Please refer to Standardisation of Master Codes.
9. Station:- Please refer to Standardisation of Master Codes.

10. Bank Code:- Please refer to Standardisation of Master Codes.

Standardization of Master Codes

Earning/Deduction :- The list of Earning/Deductions available in IPAS is available at Annexure. All the codes currently used in Payroll of the respective unit must be mapped with the codes of IPAS. Allocation Code against each Earning/Deduction Code must be verified. Any wrong Allocation (including Transfer Division/Rly) will lead to problems during implementation of Books module.

The Codes for Non-Railway Bodies are to be created at Zonal Railway level for all of its accounting units before submitting data to CRIS. Following policy/guidelines should be used for allotment of NRB Recovery code by each Railway:-

i) NRB code will be of 6 characters. First 2 characters will be used as

RC for Clubs/Association RI
for Institutes
RY for Societies/Cooperative Banks RK
for Postal
RH for other NRB recoveries

ii) Each Railway has been allotted a single character code as CR(1), ER(2), NR(3), NER(4), NFR(5),SR(6),SER(7),WR(8), SCR(9),ECR(A),ECoR(B),NCR(C),NWR(D), SECR(E),SWR(F),WCR(G). [Refer Annexure 1: Railway Master]. This character will be used as 3rd character in NRB code. iii) Remaining 3 characters will be used as Serial number against each Series of 'RC','RI','RK','RH'.

iv) For recoveries towards Societies/Cooperative Banks (RY series), only 2 characters will be used as serial number. Last character will be used as below:-

'C' for Monthly Contribution/CMTD/Subscription
'S' for Additional/Extra/Voluntary Recovery
'L' for Recovery towards Major Loan
'E' for recovery towards Minor/Emergent Loan

This will enable system to generate Consolidated Society Statement covering above. Railway may assign any other character to denote any other type of Loan from Society.

Railways are using different Nomenclature of Loans/Subscriptions towards Societies. The above 4 types have been standardized which are part of Society Statement generated through "Salary Reports". Any other characters can be used if there are any other types of recoveries towards Societies. However, the same will not be part of Society Statement. Rather, separate vouchers will be created for such Recoveries.

v)Same club/Institute should not be allotted multiple codes even if these are shared by multiple Accounting units. Organisation like "Railway Officers Association" is a single entity although being used by all AUs. In such case, Recovery Code will be same but its payment details may be different for each AU. vi)In case of Society, 5 digits will be common for same society. Codes will vary due to 6th digit depending upon type of recovery (subscription,Loan etc.) vii)Single Code i.e. RL000 Should be preferred for LIC. Multiple codes under LIC to be avoided as payments are now a days given through NEFT. Party name and Account Number may be common to all. A separate list with Policy Number may be given to LIC office for crediting the premium. In case, LIC office does not accept payment through single cheque/branch, then only multiple codes may be allotted as under: 'RL' as starting 2 characters

1 digit Railway code as 3rdcharcter
Remaining 3 characters as serial number starting from '001'

viii) Single code MUST be used for Festival Advance (RAF00) and Court (RJ000).

Codes for Quarter related recoveries have been allotted as RQ%, No separate code for outside quarters. If such cases exist then the accounting unit is to be entered against the recovery so that correct booking is ensured.

Codes for Arrears, Overpayments and Refunds have been defined in a pattern such as E001A & R0010 for Arrear and Recovery of Basic Pay (E0010) respectively. Few exceptions exist such as RP01A for arrear of NPS recovery (RP001), RF01A for Arrear of PF Recovery (RF001) etc.

Codes not available in IPAS should be apprised to CRIS by Zonal Headquarter so that Codes are allotted by CRIS and apprised to Railway in the format MDM-2 of Appendix. This is needed to maintain uniformity at IR level.

Department:- Unit can verify the departments provided in IPAS. Codes for each department are as:-

Accounts (01), Audit (02), General Admin (03), Commercial (04), Engineering (05), Electrical (06),Mechanical (07), Medical (08), Operating (09), Personnel (10),S&T (11), Stores (12), Security(13), RCT (14)

Designation :- 7 Alphanumeric characters have been used for Designations. Starting 2 character represent Departments (AC for Accounts, CM for Commercial etc.). Designation Codes available in multiple department have been put under GC% (General) and TT %(Technical) . Next 3 digits are Serial Number. Last 2 digits denote Working Designation. e.g. In code, AC39000, AC denotes Accounts Department; AC390 denotes FA&CAO-SAG but AC39001 denotes FA&CAO (F&G) . Last 2 digits are made '00' if Working and Standard Designations are same.

The list of Designations available in IPAS is available at Annexure II. All the codes currently used in PRIME (Distinct Desigcode in PRMAEMP Table) of the respective unit must be mapped with the codes of IPAS. Designation codes describe Minimum and Maximum Grade Pay, Employee Group , Staff Category (Doctor, Running – Mobile, Running – Stationary , General).

NPA is being provided to Doctors based on Designations. Similarly Running allowance is provided to running staff based on the category of Designation. Where-ever possible, IPAS validates permissibility of Allowances based on designations.

In case code for any designation is missing, please mail me list of all such designations in the following format:-

Department	Normal or Working Designation	Short Name of Designation	Long Name	Minimum Grade Pay	Maximum Grade Pay	Employee Group	Staff Category	Pay Band	Parent Designation (if Working designation)

Codes will be allotted by CRIS to maintain uniformity at IR level.

Bill Unit :- The standardization of Bill Units is to be done by the concerned unit. The guidelines for standardization of Bill Units are as under:-

i) Bill units are 7 digit unique numbers. Initial 4 digits of Bill unit represent Accounting Unit.

ii) Last 3 digits of Bill Units (000,998,999) are reserved. Please assign some other Bill Unit Number for such Bill units.

iii) Bill Unit list should contain attributes as per structure provided in "Table 1" of Appendix.

Station :- The standardisation of Station is to be done by the unit. Station is an attribute of Employee based on which he/she is entitled for HRA & Transport Allowance. Each Railway has to be provide such list with correct information of classification to avoid any wrong payment towards HRA/TPA. Format of Station Master is available at "Table 3" of Appendix.

Bank :- An standard list of Banks with IFSC Code is available in Annexure III. The list has been taken from RBI website. In case a Bank is not available in the list, it may be apprised in the Format provided under MDM-3 of Appendix.

In case of core banking (STEP) for SBI, IFSC for each branch is optional. As in case of core banking, payments are credited in employees' accounts based on only Account Number, Railways are free to provide either IFSC of banks against each employee in Bio-data or provide common IFSC of its Main Treasury.

In case payment Mode is ECS (as in case of RBI) and getting IFSC code for each branch is time taking, Railways may create their Bank Code of 11 digits as 2 digits Railway Code concatenated with 9 digits of MICR. 2 digit Railway Code has been allotted to each Railway as CR(01), ER(02), NR(03), NER(04), NFR(05),SR(06),SER(07),WR(08), SCR(09),ECR(30), ECoR(31), NCR(32),NWR(33), SECR(34),SWR(35),WCR(36). Refer Railway Master provided in Annexure 1.

In case a bank neither has IFSC nor MICR (may be Co-operative Bank), its code can be allotted by Railway as 2 digit Railway Code concatenated by 9 digit Serial number starting from '000000001'.

Details of banks , where Bank code is not the same as IFSC , must be ported in PRMABKC table so that it can be extracted and ported to Production environment by CRIS while porting data from other tables.

Suspense Allocation :- Standardisation of Suspense Allocation to be ensured. In IPAS, suspense allocation as defined by e-Recon has been adopted. List of suspense allocation used in IPAS/e-Recon is available in Annexure II.

Master Code Verification

Sr. No.	Master	Table	Annexure/Format	Remarks
1	Accounting Unit	PRMAAU	Annexure 2	
2	Department	PRMADEPT		
3	Section	ACMASECTION		
4	Bill Type & sub type	ACBILLTYPE & ACBILLSUBTYPE	Annexure 2	
5	Receipt Type (MCR)	ACCPMCRRT		May be deferred till implementation of Cash & pay office commences
6	Receipt Type (CRN)	ACMARCPTTYPE		May be deferred till implementation of Cash & pay office commences
7	Bank	PRMABKC	Annexure 3	Taken from RBI website

Master Code Mapping

Sr. No.	Master	Table	Remarks
1	Department	PRMADEPT	
2	Designation	PRMADESG	
3	Earning/Deduction	PRMAEED	
4	Suspense Allocation	ACSUSALC	
5	Fund Source	ACMAFUND	

Department :- Department used in the unit should be mapped in following format. Complete list of Department in IPAS is as Accounts (01), Audit (02), General Admin (03), Commercial (04), Engineering (05), Electrical (06),Mechanical (07), Medical (08), Operating (09), Personnel (10),S&T (11), Stores (12), Security(13), RCT (14).

Department Code used in PRIME	Department Code in IPAS

This will be useful while preparing data for Bill Unit (PRMAGRP), Employee (PRMAEMP) , Spending Unit (ACSPU) etc. by the unit.

Designation :- Designations used in the unit should be mapped in following format. Complete list of Departmentwise Designations in IPAS is available in Annexure-2.1 & 2.2. However, only those Designations need to be mapped which have been used in Employee (PRMAEMP) table.

Designation Code used in PRIME	Designation Code in IPAS

Earning/Deduction :- Earning/Deduction (ED) Code used in the unit should be mapped in following format. Complete list of Earnings/Deductions in IPAS is available in Annexure-2B. A document on Allowances/Recovery is available. Units are advised to verify various attributes such as Allocation, Taxable, Rule based, Monthly, Continuous, Installment based etc.

Users are advised to map only those EarningDeduction codes which are used in Payroll Transactions. This may be taken as Union of Distinct Earningdeduction from PRMAPRA, PRMAMED, PRMARED, PRMALOAN tables of PRIME.

ED Code used in PRIME	ED Code in IPAS

Suspense Allocation :- Suspense Allocation used in IPAS are as per e-Recon Application developed by Western Railway in consultation with Railway Board. However some Railways are still using old allocations. Units are advised to verify suspense allocations (available in Annexure 2 C) and prepare a mapping table in following format:-

Suspense Allocation used in AFRES	Suspense Allocation in IPAS

Fund Source :- For Works Register Data, existing Fund source code used by unit must be mapped with the Fund source used in IPAS.

Fund Source used in AFRES	Fund Source in IPAS
	DF1
	DF2
	DF3
	DF4
	CAP
	DRF
	OLWR

Data Porting

Mandatory:-

Sr. No.	Master	Table as in PRIME/AFRES	Table as in IPAS	Remarks
1	Bill Unit*	PRMAGRP	PRMAGRP	Bill Unit Master (PRMAGRP) contains all the bill units of Accounting unit.
2	Station*	PRMASTN	PRMASTN	Station Master containing information on classification for HRA/Transport Allowance.
3	NRB Recovery*	PRMAEED	PRMAEED_NRB	NRB codes are to be allotted by Zonal Railway for all its Accounting unit.
4	Employee*	PRMAEMP	PRMAAPPT & PRMAEMP	Employee Master (PRMAEMP) contains all the employee related details. For ex. Employee Name, Date of Birth etc. Appointment Master (PRMAAPPT) contains Appointment related details. The data of Serving Employees to be given. Data of Retired employees may be given optionally for future use during Revision of Retirement benefits.
5	Pay Rate*	PRMAPRA	PRMAPRA	This table contains all the rule based allowances (HRA, Transport Allowance, News/Magazine Allowance etc.) of the employees. Only Valid and current data to be given.
6	Allowance/ Recovery*	PRMAMED & PRMARED	PRMAMED	This table contains all the current and continuous monthly earning and deduction of employees. Only Valid and current data to be given.
7	Loan*	PRMALOAN	PRMALOAN	This table contains all the Loan Transactions of the employees . Only Valid and current data to be given for employees whose loan is still pending to be recovered from Salary.
8	Party Master for Courts/ Beneficiaries*		ACMAJUDPRT	Party Master for Beneficiaries due to court's order for recovery from Employee's salary.
9	Recovery against court cases*		PRMACRTPARTY	Employee wise Recoveries against Court Cases.
10	Employee-wise Allocation*	PRMAEMPALC	PRMAEMPALC	This Table contains allocation of Employees if it is different than the allocation defined for his/her bill unit. Only Valid and current data to be given.
11	Leave Balance	PRTRLVH	PRTRLVH	This Table contains Leave Balances for LAP & LHAP of employees
12	Leave Transactions*	PRTRLVD	PRTRLVD	This Table contains Leave Transactions of employees required to be ported for those which affects pay deduction such as LHAP, Absent, LWP etc. Only Valid data to be given for the month for which trial will be made to cross check salary.
13	Shop*		PRMASHOP	Shop Master for Workshops

14	Workshop Supervisor			
15	Service Shop			
16	Income Tax	PMAITCUM	PMAITCUM	Income Tax Transactions for current financial year starting from April and up-to the previous month when IPAS made live. Transport Allowance to have relevant
				amount of Transport Allowance (after reduction of permitted income tax free amount)
17	Salary	PRMACUM	PRTRNPDALC_ARCH PRTRNPH_ARCH	Salary Transactions for current financial year starting from April and up-to the previous month when IPAS made live in PRTRNPDALC_ARCH. Summary of salary details (month wise, employee wise) to be created in PRTRNPH_ARCH. This will be useful during preparation of DA Arrear and Bonus.
18	Party	AFPRTMST	ACPRTMST	This table contains all the inside and outside party of Railways. Party Code is basically of 12 characters and its code configuration depends on the type of party.
19	Spending Unit	AFSPU	ACSPU	Spending Unit of the units. SPU is of 8 digits. Starting 4 digits represent Accounting Unit; Next 2 digits are for Department and last 2 digits for serial number.
20	Contract Agreement	AFAGTMST	ACAGTMST	Valid Contract Agreements where payment is to be made to contractors against a contract agreement.
21	Purchase Order	AFPOMST	ACPOMST	Valid Purchase Orders where payment is to be made to vendors against supplier bills
22	Provident Fund	AFPFHDR & AFPFTRAN	ACPFTRAN	This contains PF ledger of the employees. It may be ported as per requirement of unit whether complete or for only current Financial year. The data needs to be reconciled. Data structure :-Employee No, Transaction Type, Amount, Transaction Date, Bill Unit). Transaction Type (PSR-Subscription, PVR-VDPF, PLR-Loan Recovery, PIR-Interest, PRL-Relaxation, PFTTemporary Withdrawal, PFF- Final Withdrawal, PFS-Settlement)
23	Financial Transactions	AFINTTRN	ACFINTRN	Financial Transactions for current financial year starting from April and up-to the previous month when IPAS made live. This is required for generating Account Current. Data is required for following columns: Book Date, Allocation, Dr/Cr, Amount, Voted/Charged, Voucher Type(CO7, MCR, Revenue JV, Capital JV)
24	Works		ACWORKSHDR & ACWORKSDTL	Works being executed by the unit
25	Estimate		ACESTMTHDR &	Department wise sub estimate for the works

			ACESTMTDTL	
26	Station-wise Treasury		ACSTNBKC	Required for Cash (Shroff) Module. Stations remit their cash earnings into specified bank (Treasury). Treasury Remittance (TR) note is sent by stations to shroff Office. The list of treasury in each such station is required before Cash (Shroff) module is implemented.

Note: Tables marked with (*) are the minimum tables (11) for data porting to start training and trial run of Payroll. Data porting for other tables may be done subsequently by Railways before initiating implementation of other modules.
Optional:-

Sr. No.	Master	Table	Remarks
1	Family Details	PRMAFAM	
2	Nomination Details	PRMANOM	
3	Qualification Details	PRMAQUAL	

Data Validations

Sr. No.	Item	Description	Remarks
1.	Employees with Duplicate Number	Duplicate Employee Number should not exist in entire Railway.	Prefixing with 3 digit code will make Employee Number Unique.
2.	Employees with null or dummy field against Mandatory fields.	All the mandatory fields should be available and should not have dummy value. Mandatory fields are mentioned in this document.	
3.	Invalid DOB	DOB should be valid	If DOB is not known, it may be taken as 29-02-1976. However the same MUST be corrected before IPAS implementation.
4.	Invalid Appointment date	Appointment Date should be valid	If Appointment date is not known, it may be taken as 15-08-2000 (for PF optee) and 15-08-2004 (for NPS). However the same MUST be corrected before IPAS implementation.
5.	NPS employees having invalid PPAN Number	NPS Employees should have valid 16 digit PPAN Number (if allotted by the concerned Railway)	

6.	NPS employees having invalid PRAN Number	NPS Employees should have valid 12 digit PRAN Number (if allotted by NSDL)	
7.	NPS Employees with PF deduction	NPS Employees should not have PF deduction	Based on SavingScheme attribute of PRMAEMP, it will work.
8.	Non NPS employee with NPS deduction	Employees under PF should not have NPS deduction	Based on SavingScheme attribute of PRMAEMP, it will work.
9.	No recovery of NPS	Employees under NPS should have NPS deduction	
10.	No recovery of PF	Employees under PF should have PF deduction.	
11.	Wrong Joining date or scheme	NPS Employees should have joined on or after 1/1/2004	
12.	Duplicate PRAN	Duplicacy in PRAN Number	
13.	Duplicate PPAN	Duplicacy in PPAN Number	
14.	Duplicate PAN	Duplicacy in PAN Number	
15.	Duplicate Account Number	Duplicacy in Account Number	
16.	Invalid Grade Pay	Invalid Grade Pay or grade pay does not belong to Payband	
17.	Gazetted bill unit but employees payband<3	Gazetted bill unit having non gazette employees	
18.	Non Gazetted bill unit but employees payband>=3	Non Gazetted bill unit having gazetted employees	
19.	Employees having null or Invalid Bill Unit	All Employee should have a valid bill unit	
20.	Invalid Designation Code	Invalid Designation Code	
21.	Invalid Payment Details	All employees should have valid Payment Mode, Bank Code (IFSC) , Account No. Bank Code/Account No. may be kept blank only in case of Cash Payment. Account Number must be verified for its correctness as left side zeros should not be ignored as it is a character string and not a number. No of digits may also be checked for specific banks (IFSC).	
22.	Invalid Payment Mode	Payment Mode should be correct and compatible to Bank Code (e.g. STEP for core banks)	
23.	Designation not sync with Grade Pay	Grade Pay of employees are as per grade pay against Designation in Designation Master. (exception MACP)	

24.	EDCODE in PRMAMED for which nvl(PRMAEED. MEDEDIT,'N')<>'Y'	All the allowances/recovery under current/continuous should have "MEDEDIT" flag="Y" in ED Master.	
25.	EDCODE in PRMAPRA for which nvl(PRMAEED. PRAEDIT,'N')<>'Y'	All the allowances/recovery under Payrate should have "PRAEDIT" flag="Y" in ED Master.	
26.	EDCODE in PRMALOAN for which nvl(PRMAEED. LOANEDIT,'N')<>'Y'	All the recoveries under LOAN should have "LOANEDIT" flag="Y" in ED Master.	
27.	Referential Integrity and Check Constraints	All the concerned Foreign keys must be enabled to avoid loss of data integrity	
28.	Correctness of Transport Allowance	Income Tax Data ported should have relevant amount of Transport Allowance	
29.	Employees without Option "Declaration" getting HRA	Employees with Lease/Quarter should not be given HRA.	

Recoveries against Non-Railway Body must have corresponding details (Payment Mode, Name to be printed on Cheque/ Bank IFSC Code, Account No) for making payments to the respective organization/societies. This is to be kept ready as per format 2(B) of Appendix so that it can be entered into IPAS before starting implementation.

Configuration

The following configurations are to be done by CRIS before implementation of IPAS in the unit:-

Sr. No.	Module	Item	Table	Remarks
1	IC	Serial Number Generation	ACDOCCON	
	IC	Master of Treasuries of IR	ACMABKC	format
2	IC	Treasuries applicable to the concerned accounting unit	ACAUBKC	format
3	Cheques	Cheque Starting Serial No	ACCHQBLK	format
4	IC	Valid Payment Modes in the concerned accounting unit	ACMAAUPM	format
5	IC	Debit Account No. and related parameters for payment to Bank	PRMAAURTGS, PRMAAUECS & PRMAAUEFT	format
6	IC	Bill type applicable in each section of concerned accounting unit	ACSECTIONBILL	format
7	Cash (CRN)	Cash Book Closing day of the month	ACCPCSHBKDAYS	format
8	Payroll	Stage of Salary Preparation for each Bill unit	PRMASYS	
9	Books	Unit Master for Books Module	ACMABKUNITS	
10	PF	PF Header Table to be generated from Transaction Tables for ported data	ACPFHDR	
11	Payroll	PRTRNPD_ARCH to be generated from PRTRNPDALC_ARCH for ported data	PRTRNPD_ARCH	

Chapter 6: User Management

User Credentials

i. Login requirements:- Each Login ID shall uniquely identify only one post. Shared or group Login-IDs are not permitted. The existing pattern for LoginID (User-Id) is

<Rly><au><Section/Department><Gazetted/Non-Gazetted><running sr. no>

e.g. er01exp1001, er02pen2001 where 'er' stands for Eastern Railway, '01' stands for Accounting unit of Headquarter (last 2 digit of 4 digit AU code), exp & pen stands for expenditure section and Pension section respectively and last 3 digits are running serial number. 4th digit from the last indicates whether the user-id is against Gazetted Post or Non-Gazetted post. Here 1 indicates for Gazetted, 2 for Non Gazetted and 0 for Not Applicable.

ii. User Profile :- There will be one to one mapping between Login Ids and Employee Number. Each Login Id is assigned a valid Employee Number. Same employee number cannot be assigned to multiple Login Ids. Login Ids without a valid employee number will not be permitted to access IPAS.

In case of retirement of user or transfer to another accounting unit, system will remove employee number against his login id and therefore, he/she will not be able to access IPAS. He/she will be allowed to access IPAS again when his/her employee number is assigned to new Login Ids. Users are responsible for all activities performed with their Login-Ids.

A user can perform following activities through "My Account" option:-

- Change Password
- View Audit Trails
- View Permissions granted to him/her
- Set Quick links
- Enable OTP Alerts
- Upload his/her Photograph
- Update Personal e-mail ID and personal mobile numbers

iii. Password:-

a. Password length should be minimum 6 characters for the user account.
b. Password should be combination of Upper and lower case character, digits and permitted special character.
c. Password should not be based on any of the following:-
   - Dictionary Words and its Reverse.
   - Combination of dictionary words.
   - Names, reference of User ID, User Name, Organization Name, Date of Birth, Telephone Number, Personal Details etc.
d. All passwords shall be promptly changed if they are suspected of being compromised, or disclosed to vendors for maintenance and support.

e. Passwords shall not be shared or divulged unless necessary (e.g., helpdesk assistance, shared PC and shared files). Any shared passwords should be changed promptly when the need no longer exists and should be changed frequently if sharing is required on a regular basis.
f. Users shall disable "Remember Password" or “Auto Form Fill”
g. Users shall avoid accessing Application from untrusted systems or cyber cafes to avoid stealing of passwords and information.
h. If an account or password is suspected to have been compromised or disclosed to untrusted party like Vendor, the user should immediately change the password.

The above are recommendatory in nature. IPAS stores the passwords in hash (encrypted) form and passwords are never logged by the system. Passwords are encrypted through SSL when transmitted over network.

iv. Authentication

a. All successful/unsuccessful Login will be captured by IPAS. Failure of 10 unsuccessful Login will send an alert to the users on his registered mobile numbers. It will lead to account locking after 20 consecutive unsuccessful logins. Re-activation of the Login will be done by Administrator of the accounting unit using their local procedure.
The criterion of number of unsuccessful attempts will be reduced after successful implementation of IPAS in the units and users are comfortable with IPAS and its security mechanism.
b. Trapping of Details :- System will capture IP, Session, Login & Logout date/time while accessing IPAS.
c. System will have two way authentication by sending a code (OTP) on user’s mobile. The validity of such code is 15 days. The OTP is being sent on mobiles who have registered their mobile numbers with IPAS. System will be open for 24*7. Use of Digital Signatures may be introduced for working on IPAS Application. This will enhance the Security of IPAS and will bind users legally for the transactions made by him/her.
d. Inactivity Timeouts :- Default time for session out has been kept as 30 minutes. If the user is inactive for more than this defined time out, his/her session will become inactive and user has to re-login.

User Accounts

Users Accounts will be managed by Administrators who can perform following activities:-

i)Creation of Users ii)Disabling an user iii)Enabling an user iv)Granting/Revoking of roles

v) Resetting of Password in case a user has forgotten password. New system generated password will be sent on the user’s registered mobile. For unregistered mobile users, it will be displayed on screen and administrator will communicate such password to the user.
vi) Re-activation of the Login in case of locked account due to consecutive 6 unsuccessful Login attempt.

in both the cases vi. & vii. , user will be asked to change the password during first login. All the activities password change/reactivation will be logged by IPAS and it can be viewed by

the concerned users under Account History. Reports to view such activities are also available to Zonal Administrator.

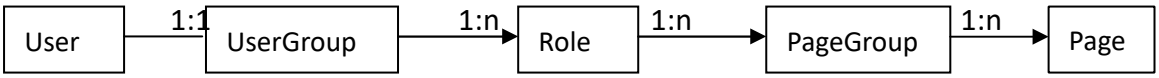
vii) Permission of Bill Units:- Administrator will change the permission of Bill Units and verify that one and only one Paybill Clerk is authorised for a bill unit for Payroll Preparation. Similarly one and only one Bill Passing official is authorised for one bill unit in case of salary bill passing. viii)Permission of Sections:- Administrator will change the permission of Sections. ix)Monitoring Audit Logs

x) Monitoring of Invalid Data

Chapter 7 : Roles and Permissions

1. Every Page of IPAS has been assigned a Page ID by CRIS.
2. Set of Pages have been clubbed to form a Page Groups. Being one time exercise, Creation of new Page Groups/modification of existing Page Groups will be done by CRIS.
3. Roles have been created by CRIS which have been mapped to one or more Page Groups.
4. User Groups (Stakeholders or Actors) have been identified and created by CRIS.
5. A "User Group" has been granted permissions for one or more Roles. Default mapping has been done by CRIS. However, the same can be changed by Zonal Railways as per their practice.
6. An individual user (Login-Id) will belong to one and only one "User group".

Relation between User (Login Id), User Group, Role, Page Groups and Pages is depicted below:-



The following User Groups have been identified along with their function roles:-

Sr. No.	Code	Description	Purpose
1	CDR	Cadre	Maintenance of Employee Data, Leave Posting etc.
2	PBL	Paybill	Preparation of Establishment Bills such as Salary, Supplementary, Bonus etc.
3	LNP	Loan (P)	Preparation of Loan Bill against Civil Grants such as Scooter/Car/House Loan
4	SLN	Society Loan	Starting and closing of Society Loans (such as NZRE in Northern Railway)
5	CUG	CUG Recovery Entry/ Porting	Recovery against CUG mobile phone Bills
6	SUB	Supplementary Bill	Preparation of Supplementary Bills
7	STLP	Settlement (P)	Preparation of Settlement Bills
8	QTR	Quarter	Maintenance of Quarter Data and recovery against its rent
9	ELE	Electricity	Recovery of Electricity Bills
10	EST	Establishment Bills	Passing of Establishment Bills
11	NPS	NPS (National Pension Scheme) Bills	Passing of NPS Bills and Uploading of NPS data on NSDL Website
12	SET	Settlement Bills	Passing of Settlement Bills such as Leave Salary/GIS
13	LNA	Loan Bill Passing	Passing of Loan Bills
14	EXP	Other Bill (Expenditure)	Passing of Expenditure Bills
15	STR	Other Bill (Stores)	Passing of Stores Bills
16	RCT	Other Bill (RCT)	Passing of RCT Bills

17	PF	PF Bills	Maintenance of PF Ledger of employees, Passing of PF Advances/Settlement Bills, Interest Calculation and closure of Accounts
18	PEN	Pension Bills	PPO Generation, Preparation and Passing of
			Pension Bills such as DCRG & Commutation.
19	CHQ	Cheque Writer	Preparation of Abstract and Printing of Cheques
20	BKS	Books	Confirmation of Journal Voucher (JV), preparation of Trial Balance, Ledger and Account Current (Approximate & Actual) along with its schedules.
21	RIB	Remittance into Bank	Responsible for RIB Reconciliation by reconciling TR received from Cash Office and Scrolls received from Banks
22	CHQR	Cheque Reconciliation	Responsible for Cheque Reconciliation by reconciling Cheque (issued by Railway) and Scrolls (received from Banks)
23	ESUS	E-Suspense	Maintenance of Establishment Suspense
24	GSUS	G-Suspense	Maintenance of General Suspense
25	SHRF	Shroff	Collection of Cash & instruments received from stations through CR Note and its Remittance into Bank.
26	CSMR	Cashier (MCR)	Issuing of Miscellaneous Cash Receipt (MCR) against received Cash/Cheque/Draft
27	CCR	Chief Cashier	Freezing of Cash Book
28	CCPY	Chief Cashier (Pay)	PMR Registration and Distribution of PMR to Cashiers for further payments as per advice of Books.
29	CSPY	Cashier (Pay)	Dispatching/Handing over Cheques, Cash payment and preparation of Paid & Unpaid vouchers
30	RBGT	Revenue Budget	Preparation of Revenue Budget
31	CBGT	Capital Budget	Preparation of Capital Budget
33	WRK	Works Budget	Maintenance of Works Register
32	EXCH	Exchequer Controller	Cash Authorisation
33	TA	Traffic Accounts (CRN Auditing)	Auditing of Cash Remittance (CR) Note
34	MGMT	Management	Viewing Concerned reports to help in making Managerial decisions
35	ADMIN	Administrator	Administration and Monitoring activities of IPAS

Detailed functional role of each User Group is given below:-

1. Cadre:- Employees of this User Group are responsible to maintain the Employee Service Records. The functional role of Cadre is as under:- i.Maintenance of employee data ii.Maintenance of Leave Balances
   iii.Maintenance of service record of employees

2. Pay Bill:- Pay Bill officials are designated employees who are responsible for preparation of payments of the employees. The bill clerk prepares the payments for the employees of only those Bill Units for which he/she is authorised. Such authorisation is granted by Administrator of the respective Accounting Unit. Payments of few departments (such as Accounts & RPF) is prepared by bill clerks of their departments and for other departments (Personnel, Mechanical, Electrical, S&T etc.), it is prepared by Bill Clerks of Personnel department. The functional role of bill clerks are as under:-
   i. Entry of change data, Salary preparation and forwarding the salary details to Accounts for passing.
   ii. Preparation of DA Arrear
   iii. Preparation of Travelling Allowance/Contingency payments and its inclusion in Regular Salary Bill iv.Preparation of other establishment bills viz. Bonus, Cash Compensation, Child Education and forwarding it to Accounts for payments through Supplementary Bill
   v.Deduction of Income Tax from Salary as per Income Tax rules and distribution of Form 16 to the employees.
   i. Inclusion of Non-Interest Bearing Advances (e.g. Festival Advance) in the salary and subsequently its recovery from monthly salary.
   j. Preparation of PF withdrawal (Temporary & Final both) and forwarding it to Accounts for Passing
   k. Calculation of Average Pay and forwarding it along with other details to Accounts Department.
   l. Calculation of Incentive in case of for workshop employees.

3. Loan Bill :- An official responsible for preparation of Interest Bearing Loans and Advances Bills such as House Building, Car, Motor cycle/Scooter, Computer etc.

4. Society Loan: A person responsible for ensuring proper recovery of Society Loans of employees in the Accounting Unit. They can start recovery, stop recovery, port recovery data of society loan.

5. CUG :- An S&T official responsible for recovery of CUG call charges beyond ceiling of each employee. The official can make entry through screen or can port the data in the system through user friendly screens. He is also responsible for maintaining CUG numbers allotment so that recovery is made from the concerned employees.

6. Supplementary:- Normally Supplementary bills are prepared by Pay Bill Officials. However, in some cases these are also prepared by other officials to reimburse the Medical Expenses, Staff Benefit Fund etc.

7. Settlement:- An official responsible for preparation of Settlement Bills (viz. GIS, Leave Salary Bill) of retiring employees.

8. Quarter:- An official of Engineering department to maintain records of Quarters of Railways. He is responsible for recovery of various monthly charges(rent, Geyser, Lawn, Fan, Cooler etc.) from the salary of the persons occupying Railway quarter.

9. Electricity:- An official of Electrical Department who is responsible for recovery of Electricity Charges (Fixed Cost & Electricity Consumption charges) based on the rates fixed by respective Electricity Boards time to time.

10. Bill Registering Official :-
    In units following system of Centralised Bill Registration, a separate official is assigned for this work. All Bills submitted by Personnel department online or deposited directly by contractors/suppliers are registered centralized in each Accounting Unit by assigning CO6 Number.

11. Bill Preparing Official:-
    In units following system of Decentralized Bill Registration, staff of AA level registers the bill by assigning CO6 Number. After Registration, Internal Check of the bill is performed at 3 levels. At level 1, it is done by AA, at 2nd level it is verified by Supervisor (SO/Sr. SO) and at 3rd level, it is passed by concerned Gazetted Officer (AFA/Sr. AFA). Similarly, CO7 of bills is also performed at 3 levels. At level 1, CO7 is prepared by AA, at 2nd level it is verified by Supervisor (SO/Sr. SO) and at 3rd level, it is confirmed and forwarded to Books Section by concerned Gazetted Officer (AFA/Sr. AFA) for preparation of Cheques.

12. Bill Verification Official: - As described above, Bill Passing officials perform Verification of Bills during Internal Check (Level 2) of the bill. They also perform verification of CO7. Each Bill Verification official is authorised for performing the aforesaid activities for the sections for which he is authorised. Authorisation of Sections is granted/revoked/changed by Administrator of the Accounts department in concerned Accounting Unit.

13. Bill Passing Official :- Bill Passing officials are responsible for Passing of Bills (Level 3). He is also responsible for confirmation of CO7 to forward the bills to Cheque Section for Printing of Cheques. Each Bill Passing Official is authorised for performing the aforesaid activities for the sections for which he is authorised. Authorisation of Sections is granted/revoked/changed by Administrator of the Accounts department in concerned Accounting Unit.

14. Cheque Writer :- Cheque writer is a designated employee of Accounts department who prepares Abstract and print cheques for entire accounting unit.

15. Books User :- AFA/Books or his nominated officials are responsible for following functional activities:-

    i.JV preparation ii.Confirmation of Journal Voucher (JV) prepared by all sections iii. Interfacing (Uploading of JV) with e-Recon iv.Preparation of various reports such as Trial Balance, Ledger, Journal etc.

    v.Account Current (Approximate and Actual) and associated schedule reports

16. PF User:- Accounts official of PF Section for Passing of Provident Fund withdrawal (Temporary & Final both) Bills, Posting of CO7 and its confirmation. He is also responsible for interest calculation and maintenance of Ledger.

17. Pension User: - Accounts official of Pension Section for verification/correction of Employee Details and Pension calculation. He allots PPO number and generates PPO for sending it to Bank. He is also responsible for passing of Settlement Bills, Posting of CO7 number for such passed bills and confirmation of CO7.

18. Cheque Reconciliation Official :- An official responsible for Cheque Reconciliation. The cheques as issued through IPAS are stored in Database. The scroll data as received from Banks is either entered or imported in the system to generate exception reports.

19. RIB Reconciliation Official:- An official responsible for RIB Reconciliation. The instruments (Cash/Cheque/Draft) as deposited in the banks through Treasury Remittance (TR) Notes are stored in Database. The scroll data as received from Banks is either entered or imported in the system to generate exception reports.

20. Cashier (MCR):- An official responsible for Issuing of Miscellaneous Cash Receipt (MCR) against received Cash/Cheque/Draft. In case of Cheques, he issues Transit Number only. MCR is issued only after realization of cheques.

21. Chief Cashier (Pay):- Chief Cashier is responsible for the payments through Cashiers under him. He receives abstract for Payments from Books Section, Assigns PMR No and Distributes PMRs among Cashiers for further payments as per advice of Books.

22. Cashier: - Cashiers of Cash & Pay office are responsible for distributing payments to the employees and outside parties. Cash payment is done directly to the employees/parties whereas Cheques are given in person or may be sent through dispatch.

23. Shroff:- Shroff is an official in Cash Office who manages the Earning received from Stations. Instruments (Cash, Cheques, Drafts), Vouchers (e.g. Military Warrants etc.) and TR (Treasury Remittance) Note along with Cash Remittance Note (CRN) is received by Shroff in bags from stations. Shroff matches the instruments received with the details given in CRN. Shroff is also responsible for remitting these instruments and cash in Specified Banks.

24. CR Note Auditor :- An official of Traffic Accounts department who is responsible for auditing of Cash Remittance Note (CRN). This is verified against Balance Sheets of the stations as received in Traffic Accounts department.

25. PHOD:-Principal Head of Departments (PHODs) in Zonal Headquarter prepares Budget Estimates for their department and send it to AFA/Budget of Zonal Headquarter for Consolidation.

26. AA (Revenue)/Budget:- AA(R)/Budget is responsible for preparation of Budget Estimates, Budget Proportion at Headquarter. Each AA is assigned one or more demands for entry of Budget Estimate/Proportionate Data.

27. SSO (Revenue) Budget:- SSO (R)/Budget is responsible for preparation of Budget Estimates and distribution of Budget Grant. AFA/Budget in units prepares the Budget Estimates for his units and sends it to Headquarter for consolidation. Estimates received from Each accounting units and each department of Headquarter are consolidated, modified and sent to Board for projecting the estimates of the Zonal Railway.

28. AA (Capital)/Budget:- AA(C)/Budget is responsible for preparation of Capital Budget Estimates at Headquarter.

29. SSO (Capital) Budget:- SSO (Capital)/Budget is responsible for preparation of Budget Estimates and distribution of Budget Grant. AFA/Budget in units prepares the Budget Estimates for his units and sends it to Headquarter for consolidation. Estimates received from Each accounting units and each department of Headquarter are consolidated, modified and sent to Board for projecting the estimates of the Zonal Railway.

30. SSO (Works):- SSO (Works)/Budget is responsible for preparation of Budget Estimates and distribution of Budget Grant for all the works under Demand 16.

31. Exchequer :- An official who controls Exchequer of the Accounting Unit. The cheques are issued by the units within the ceiling (known as Cash Authorisation) as decided by Excheque control authority every month.

32. Suspense User: - AFA/Suspense maintains Suspense of their accounting unit. One official handles one or more suspense heads. He also reconciles the suspense Transactions and Financial Transactions for each month.

33. e-Suspense User: - AFA/e-Suspense maintains Suspense (Establishment) of their accounting unit. One official handles one or more e-suspense heads. He also reconciles the e-suspense Transactions and Financial Transactions for each month.

34. Management :- Railway Management can view all the standard reports generated by the system. He can analyse the data and generate statistics available in IPAS. However, access of the data is permitted to his/her jurisdiction only. An official of management level at Zonal

Headquarter can view the data of entire Railway whereas other accounting units can access the data pertaining to their accounting unit only. Users of Railway Board will be able to see/analyse the data of all Indian Railways whenever IPAS is implemented in all the Zonal Railways.

35. Administrator :- Railway has to nominate an administrator in each of the Accounting Units including Headquarter. The loginids for such administrators have been created as admin<divisioncode> such as 'adminjp', 'adminju', 'adminbkn', 'adminaii', 'adminhqr', 'adminjuws', 'adminbknws', 'adminaiiws','adminjpcon' etc.

    Zonal Administrator accounts for entire Railway has also been created. Zonal Administrator will manage the Administrator accounts of all the units. Loginid of Zonal Administrator has been created as admin<rly> such as 'adminnwr'.

    In addition, Administrator accounts have been created for IT Centre personnel also. The functional role of Administrators have been detailed in chapter "Administration of IPAS".

Chapter 8: Administration of IPAS

Railway has to nominate administrators in each of the Accounting Units including Headquarter. The loginids for such administrators has been created as admin<divisioncode> such as ‘adminljn’, ’adminnerhq’, ’adminbsb’ etc.

One Zonal Administrator for entire Railway has been created by CRIS and the same may be used by nominated officer of the Zone. Zonal Administrator will manage the Administrator accounts of all the units. CRIS will create loginid of Zonal Administrator as admin<rly> such as ‘adminner’.

Addition to above, Administrator Logins for IT Centre Staff (Zones & units both) and Personal/Accounts department (in each Accounting unit) has also been created. The same may be activated by Zonal Administrator/Unit Administrators by updating their employee number and mobile numbers. The summary of the administrative users is as under:-

ACTIVITY	ZONAL		UNIT / DIVISION			
	Administrator	IT Centre Administrator	Administrator	IT Centre Administrator	Personnel Administrator	Accounts Administrator
Admin Level	2	3	4	5	6	7
Maximum No. of Login IDs	1	6	1	2	4	2
Login ID Sample	ADMINER	ADMINER01, ADMINER02,...	ADMINMLDT	ADMINMLDT01, ADMINMLDT02	ADMINMLDTP01, ADMINMLDTP02,...	ADMINMLDTA01, ADMINMLDTA02
Purpose	For IPAS implementation head (CIO/NWR, SR EDPM/NER, SMIT/ER	Persons working on behalf of IPAS implementation head	For IPAS implementation head in units (Sr. DFM)	Persons working on behalf of Administrator	For Payroll related Modules	For Accounts related modules
Login ID Activator	CRIS (Admin Level 1)	ADMINER (Admin Level 2)	ADMINER (Admin Level 2)	ADMINMLDT (Admin Level 4)	ADMINMLDT (Admin Level 4)	ADMINMLDT (Admin Level 4)
User Management						
Permission of Bill Units						
Change of Section						
Bill Return						
Transfer In						
Bank Master						
Admin Activation						
Employee Data Update						
Employee No. Update						
Treasury Change / Paymode						
Change in Allocation						
CO7 Unconfirm (Return from Books)						
Extraction of data through Oracle SQL						

Chapter 9: Pre-Requisite for other Modules

Cheque Reconciliation

Cheque Reconciliation process is used to compare credit and debit side of Cheques to ensure figures are in agreement and accurate. Credit side entry in the system comes from cheque issued through the Books module of IPAS.

To start implementation of cheque reconciliation modules, the data of all the outstanding cheques issued prior to implementation of Books module is required to be ported into the system. The format of the cheque details is as under :

COLUMN	PURPOSE
CHEQUENO	Cheque Number
CHEQUE DATE	Cheque Issuing Date
CHEQUEAMOUNT	Cheque Amount
TREASURY	Treasury of Issued Cheque
UNIT	Accounting Unit

The data needs to be provided in Microsoft Excel format.

RIB Reconciliation

Off days (Bank Holiday) Master to be provided, which is used for Penal interest calculation. Penal Interest rules to be provided.

Cash & Pay

The purpose of this module is to capture earning of railway from miscellaneous and station earning.

This module is divided in two parts.

MCR (Miscellaneous Cash Receipt) for Miscellaneous Earning CRN

(Cash Remittance Note) for Station Earning

Pre-requisite:

To start the implementation of these modules, the following data needs to be provided:-

i) List of Locations where shroff offices are situated and its accountal is captured with which Accounting unit

ii) Opening Balance on a particular date

iii) List of Stations (Station Code, Station Name, Section Code) from which CRN are received to the cash office

iv) Station wise Bank Details (Station Code, Bank Name, Bank IFSC) if the Cash/cheque is remitted in the bank by stations.

v) Details of Shroffs (Emp No, Name, Mobile No, Accounting Unit) working in the cash office

vi) Details of Cashiers (Emp No, Name, Mobile No, Accounting Unit, Cashier Type) working in the Pay office. Following codes should be indicated in cashier type for cashiers dealing with the type of cheques

NRB -> if cashier deals with only Non Railway Body Cheques

RB -> if cashier deals with only Railway Body Cheques

ALL-> if cashier deals with both the types of cheques

e-Suspense

The objective of E-Suspense is to maintain e-suspense ledgers for each employee. Debits are made when a loan is drawn and credits are made through deductions of Installments through salary. An employee can credit to suspense allocation through MCR also.

The opening balance for a particular month will be generated by the system and the same can be verified by the staff dealing with the suspense allocation.

Debits and Credits will continue to be posted in e-suspense ledger automatically. It can be run as a trial/parallel run till 1 month after live run of Payroll and Loans/Advances Modules before it is made live.

If Interest calculation is to be performed by the system, then all the transactions are required to be posted/ported. The format of the transaction is as under:

Employee Number*	
Accounting Unit*	(AU through which amount was recovered or loan was paid)
Allocation*	
ED Code	(Earning/Deduction Code e.g. RA001)
Financial Year	(e.g. 2012-2013)
Transaction Date*	(Abstract Date)
Transaction Mode	(CO7, MCR or JV)
Debit/Credit*	(Debit or Credit)
Amount*	
Reference Number	(specific CO7 Number/MCR No./JV No)
Reference Date	(specific CO7 Date/MCR Date./JV Date)

* Denotes mandatory

G-Suspense

To start the implementation of this module, List of General Suspense Allocation needs to be provided. The posting under each suspense allocation will be made by the concerned staff online.

Budget

Budget Grant should be ready to start implementation of Budget Module.

CHAPTER 10
CONCLUSION

At the end, I got to know about the functioning of Indian Railways Accounts and Finances.IPAS was implemented to provide real time access to financial transaction data in addition to bringing financial and fiscal discipline.

The integrity, completeness and consistency of data in IPAS plays a pivotal role in generating several Management Information System (MIS) reports for decision making.

1. Sr. Divisional Financial Manager/ Asansol

2. Assistant Divisional Financial Manager/ Asansol

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BCA

PROJECT SYNOPSIS :

Introduction:

A student report card management system is a software tool designed to streamline the process of generating, storing, and managing academic report cards. It automates tasks such as inputting grades, calculating averages, and generating printable report cards, making the process more efficient for schools and educational institutions. This system typically includes features like grade entry, report generation, student record management, and sometimes even analytics to track student performance over time. Overall, it aims to simplify administrative tasks related to student assessment and reporting.

NEED OF THE PROJECT STUDENT REPORT CARD MANAGEMENT SYSTEM :

The need for a student report card management system arises from the inefficiencies of manual report card generation and management processes. These systems streamline tasks such as grade entry, calculation, and report generation, reducing human error and saving time for teachers and administrators. Additionally, they provide a centralized platform for storing and accessing student records, facilitating better organization and data management. Ultimately, the project addresses the need for efficiency, accuracy, and improved administration in educational institutions.

How the project should works :

The student report card management system works by digitizing the process of creating, storing, and managing academic report cards. Here's a brief overview of how it functions:

1. ***Data Input**:* Teachers input student grades and other relevant academic information into the system through an intuitive interface.

2. ***Calculation***: The system automatically calculates averages, generates grades, and computes other necessary metrics based on the input data.

3. ***Report Generation**:* Once all data is entered, the system generates report cards for each student, typically in a printable format. These report cards can include grades, attendance records, comments, and other relevant information.

4. ***Storage and Access**:* The generated report cards are stored securely within the system, allowing authorized users such as administrators, teachers, and parents to access them as needed.

5. ***Analytics (Optional)**:* Some systems offer analytics features, allowing users to analyse student performance trends, identify areas for improvement, and track progress over time.

Services this project can provide :

In a student report card management system, the following services are typically provided:

***1. Grade Entry**:* *Teachers can input student grades and other academic data.*

2. **Calculation**: *Automated calculation of averages, grades, and other metrics based on the entered data.*

3. **Report Generation**: *Generation of printable report cards for each student.*

4. **Student Record Management**: *Storage and organization of student academic records.*

5. **Access Control**: *Authorization mechanisms to control who can view and edit student data.*

7. **Communication**: *Integration with communication channels for sending report cards to parents or guardians.*

Nature of the project:

The nature of the project student report card management system can be app-based, web- based. or utilize other platform depending on the specific requirements and preferences of the educational institute.

Software used to development :

JAVA for backend.

HTML for frontend.

DEVELOPERS OS:

WINDOWS 10,11

USERS OS:

WINDOWS 10

STUDENT REPORT CARD MANAGEMENT SYSTEM:

INTRODUCTION:

The student report card management app is an innovative solution designed to streamline the process of managing academic records in educational institutions. With the increasing complexity of educational systems and the growing emphasis on data-driven decision-making, there's a pressing need for efficient tools to manage student performance data effectively. This app aims to address these challenges by providing a user-friendly platform for teachers, administrators, students, and parents to access and manage academic information securely.

By leveraging modern technologies such as web and mobile applications, cloud computing, and database management systems, the student report card management app offers a comprehensive set of features to meet the diverse needs of educational stakeholders. From grade entry and calculation to report generation and analytics, the app provides a seamless experience for managing student academic records.

*1. **User Authentication and Authorization**:* Secure login mechanisms ensure that only authorized users can access sensitive student information.

*2. **Student Information Management**: Easily add, update, and delete student profiles, including basic information such as name, class, and contact details.*

*3. **Grade Entry and Calculation**: Teachers can input grades for various subjects, with the app automatically calculating averages and generating overall grades.*

4. **Report Generation**: *Generate printable report cards for each student, customizable to include grades, attendance records, and teacher comments.*

5. **Communication**: *Integration with communication channels enables seamless communication between teachers, students, and parents, with notifications for new report cards or updates.*

OBJECTIVES:

The objective of the student report card management project is to create a comprehensive and efficient system for managing academic records in educational institutions. The primary goals of this project include:

1. **Streamlining Administrative Tasks:** Simplify and automate the process of generating, storing, and managing student report cards. By digitizing these tasks, the project aims to reduce administrative workload and increase efficiency.

2. **Enhancing Accuracy and Consistency**: Minimize errors and inconsistencies in grading and reporting by automating calculations and standardizing report card formats. This ensures that academic information is accurate and reliable.

3. **Improving Accessibility and Communication**: Provide easy access to student academic records for teachers, administrators, students, and parents. Facilitate communication between stakeholders by enabling timely notifications and updates regarding academic progress.

4. **Enabling Data-Driven Decision-Making:** Empower educators and administrators with insights into student performance trends and patterns. By

analysing academic data, the project aims to identify areas for improvement and tailor educational interventions to meet student needs effectively.

5. **Ensuring Data Security and Privacy:** Implement robust security measures to safeguard sensitive student information and comply with data protection regulations. Protecting the confidentiality and integrity of academic records is a paramount objective of the project.

6. **Promoting Transparency and Accountability:** Foster transparency in the assessment and reporting process by providing stakeholders with clear visibility into grading criteria and academic outcomes. Enhance accountability by tracking changes and ensuring audit trails for all actions performed within the system.

Overall, the objective of the student report card management project is to modernize and optimize the management of academic records, ultimately contributing to improved educational outcomes and a more efficient learning environment.

SCOPE:

The scope of the student report card management project includes developing a user-friendly system for automating grade management, report generation, user authentication, student information management, communication integration, analytics, data security, scalability, usability, and documentation/training.

BENEFITS OF THIS PROJECT:

The benefits of the student report card management project include:

1. ***Efficiency**:** Streamlining administrative tasks, reducing manual effort, and saving time in generating and managing report cards.

2. **Accuracy**:

Minimizing errors and inconsistencies in grading and reporting through automated calculations and standardized processes.

3. **Accessibility**:

Providing easy access to student academic records for teachers, administrators, students, and parents, enhancing transparency and communication.

5. **Security**:

Safeguarding sensitive student information and ensuring compliance with data protection regulations, enhancing data security and privacy.

6. **Transparency**:

Promoting transparency in the assessment and reporting process, fostering accountability and trust among stakeholders.

7. **Scalability**:

Designing the system to accommodate future growth and changes in requirements, ensuring scalability and flexibility.

8. **Usability**:

Prioritizing user-friendly interfaces and intuitive navigation, enhancing usability for all stakeholders.

9. **Productivity**:

Increasing productivity by automating repetitive tasks and enabling efficient collaboration among educators and administrators.

10. **Improved Educational Outcomes**:

Ultimately contributing to improved educational outcomes by providing educators with the tools and insights needed to support student success.

CATEGORY OF THE PROJECT:

The Student Report Card Management System project falls under the category of educational technology or educational software. It's a system designed to efficiently manage and organize student academic data, including grades, attendance, and other related information. This type of project aims to streamline administrative tasks for educators and provide insights into student performance for parents and school administrators.

The Student Report Card Management System is typically designed as a multi-user system. Designing the Student Report Card Management System as a web-based application offers several advantages:

1. **Accessibility**: Web-based applications can be accessed from any device with an internet connection, making it convenient for teachers, students, and parents to access the system from anywhere, anytime.

2. **Scalability**: Web-based applications can easily scale to accommodate a growing number of users and data. As the number of students and faculty members increases, the system can expand without significant changes to the infrastructure.

3. **Cross-platform Compatibility**: Since web applications run in a web browser, they are compatible with various operating systems and devices, including desktop computers, laptops, tablets, and smartphones.

4. **Centralized Data Management**: Web-based applications allow for centralized data storage and management, ensuring that all users have access to the most up-to-date information.

5. **Easy Updates and Maintenance**: Updates and maintenance can be performed centrally, without requiring users to download or install anything locally. This ensures that all users are using the latest version of the application.

6. **Collaboration**: Web-based applications facilitate collaboration among users by allowing them to share information and communicate within the system.

Overall designing the Student Report Card Management System as a web-based application provides flexibility, accessibility, and ease of use for all stakeholders involved in the education process.

BACKGROUND:

Here's an overview of the theoretical background and architectural considerations for a Student Report Card Management System project:

Theoretical Background:

1. **Educational Administration**: Understanding the administrative processes within educational institutions, including grading policies, attendance tracking, and student record management.

2. **Data Management**: Principles of database design and management, including data normalization, indexing, and relational database management systems (RDBMS).

3. **Information Systems Theory**: Concepts related to the collection, storage, processing, and dissemination of information within an organization.

4. **User Experience (UX) Design**: Designing interfaces and interactions that are intuitive, user-friendly, and accessible for teachers, students, parents, and administrators.

5. **Security and Privacy**: Ensuring the security and privacy of sensitive student data through authentication mechanisms, encryption, access controls, and compliance with relevant regulations (e.g., FERPA).

6. **Software Engineering**: Principles of software development methodologies, such as agile or iterative development, to manage the project lifecycle effectively.

Architecture of the Software:

1. **Client-Server Architecture**: The system likely follows a client-server architecture, where clients (web browsers or mobile apps) interact with a central server to access and manipulate data.

2. **Three-Tier Architecture**: Dividing the application into three layers: presentation (user interface), application logic (business rules and processing), and data storage (database management). This separation of concerns enhances scalability and maintainability.

3. **Web-Based Technology Stack**: Utilizing technologies such as HTML, CSS, JavaScript for the frontend, and server-side scripting languages (e.g., PHP, Python, Node.js) for the backend. Frameworks like React.js or AngularJS may be used for frontend development, while frameworks like Django or Laravel could be employed for backend development.

4. **Database Management System (DBMS)**: Selecting an appropriate DBMS (e.g., MySQL, PostgreSQL, MongoDB) to store and manage student data securely. The choice depends on factors such as scalability, data structure, and ACID compliance.

5. **RESTful API**: Implementing a RESTful API to enable communication between the frontend and backend components. This allows for seamless integration with different client applications and platforms.

6. **Scalability and Performance**: Designing the system to handle a large number of concurrent users and data transactions efficiently. This may involve techniques such as load balancing, caching, and database optimization.

7. **Security Measures**: Incorporating security best practices, including encryption for data transmission, secure authentication mechanisms (e.g., OAuth, JWT), input validation, and protection against common web vulnerabilities (e.g., XSS, CSRF).

By incorporating these theoretical concepts and architectural considerations, the Student Report Card Management System can be developed as a robust, scalable, and secure solution to meet the needs of educational institutions, teachers, students, and parents.

Problem Statement:*

Here's a clear definition of the problem that the Student Report Card Management System aims to address

In traditional educational institutions, managing student academic records, including grades, attendance, and other related information, can be a complex and time-consuming task. This manual process often leads to inefficiencies, errors, and delays in accessing important information for teachers, students, parents, and administrators. There *is a need for a more streamlined and* efficient solution to manage student academic data effectively.

Key Challenges:*

1. **Data Disorganization**: Student academic data is often scattered across various documents and systems, making it difficult to access and update in a timely manner.

2. **Inconsistent Reporting**: Manual grading processes can result in inconsistencies in how grades are recorded and reported, leading to confusion and inaccuracies.

3. **Limited Accessibility**: Paper-based or localized systems restrict access to student information, making it challenging for stakeholders to access data when needed, especially outside of school premises.

4. **Communication Gap**: Lack of a centralized platform for communication and collaboration between teachers, students, parents, and administrators hinders effective communication regarding student progress and performance.

5. **Security Risks**: Paper-based systems pose security risks, as sensitive student data can be lost, stolen, or accessed by unauthorized individuals. Additionally, digital systems may lack adequate security measures to protect against data breaches and cyber threats.

The Student Report Card Management System aims to address these challenges by providing a centralized, secure, and user-friendly platform for managing student academic records. The system will streamline the process of recording, organizing, and accessing student data, while also facilitating communication and collaboration among stakeholders. Key objectives include:

- Centralizing student academic data in a secure digital platform.

- Automating grading processes to ensure accuracy and consistency.

- Improving accessibility to student information for teachers, students, parents, and administrators.

- Enhancing communication and collaboration through features such as messaging and notifications.

- Implementing robust security measures to protect sensitive student data from unauthorized access and breaches.

By developing and implementing the Student Report Card Management System, educational institutions can overcome the limitations of traditional paper-based

or localized systems, leading to improved efficiency, transparency, and communication in managing student academic records.

SYSTEM REQUIREMENT SPECIFICATION:

Here's a System Requirements Specification (SRS) outline for the Student Report Card Management System:

1. Introduction

1.1 Purpose:

The purpose of this document is to define the requirements for the development of the Student Report Card Management System, an online platform to manage student academic records efficiently.

1.2 Scope:

The system will include features for managing student grades, attendance, personal information, and communication between teachers, students, parents, and administrators.

1.3 Definitions, Acronyms, and Abbreviations:

- SRS: System Requirements Specification

- RDBMS: Relational Database Management System

- API: Application Programming Interface

2. System Overview

2.1 System Description:

The Student Report Card Management System is a web-based application that allows users to manage student academic records securely and efficiently.

2.2 System Architecture:

The system will follow a three-tier architecture, with a frontend interface, backend application logic, and a relational database management system for data storage.

3. Functional Requirements

3.1 User Management:

*- **Registration**:* Users can register with the system as teachers, students, parents, or administrators.

*- **Authentication**:* Users can log in securely using their credentials.

3.2 Student Management:

*- **Add/Edit/Delete Students**:* Administrators can add, edit, and delete student profiles, including personal information and contact details.

*- **View Student Profiles**:* Users can view student profiles to access academic records and other relevant information.

3.3 Grade Management:

*- **Enter Grades**:* Teachers can enter and update student grades for various subjects and assessments.

- **Grade Calculation**: The system will calculate overall grades based on weighted scores and grading criteria specified by teachers.

3.4 Attendance Management:

- **Record Attendance**: Teachers can record student attendance for classes and other activities.

- **View Attendance Reports*: Users can view attendance reports for individual students and classes.

3.5 Communication:

- **Messaging*: Users can send and receive messages within the system to communicate with teachers, students, and parents.

- **Notifications**: Users receive notifications for important events such as grade updates, attendance records, and messages.

4. Non-Functional Requirements:

4.1 Performance:

- **Response Time**: The system should respond to user actions within 2 seconds.

- **Scalability**: The system should accommodate a minimum of 1000 concurrent users.

4.2 Security:

- **Authentication**: User authentication should be secure, utilizing encryption and strong password hashing techniques.

- **Data Encryption**: Sensitive data, such as grades and personal information, should be encrypted to prevent unauthorized access.

- **Access Control**: Role-based access control should be implemented to restrict access to sensitive features and data.

4.3 Usability:

- **User Interface**: The user interface should be intuitive and easy to navigate for users of all technical levels.

- **Accessibility**: The system should be accessible to users with disabilities, adhering to WCAG guidelines.

5. System Constraints

5.1 Technology Constraints:

- **Web-Based**: The system must be accessible via web browsers on desktop and mobile devices.

- **Frameworks**: The system will be developed using HTML, CSS, JavaScript for the frontend, and a backend framework such as Django or Laravel.

5.2 Compliance:

- **Regulatory Compliance**: The system must comply with relevant regulations such as FERPA for handling student data.

SYSTEM PLANNING:

GANTT CHART:

A Gantt chart is a visual representation of a project schedule that shows the start and finish dates of various elements of the project. Here's how we can create a Gantt chart for the Student Report Card Management System project:

Activity	Start Date	Duration (days)	End Date
Initiate Project	2024-04-15	5	2024-04-19
Gather Requirements	2024-04-20	10	2024-04-30
Design System	2024-05-01	15	2024-05-15
Develop Frontend	2024-05-16	20	2024-06-04
Develop Backend	2024-05-23	20	2024-06-11
Set up Database	2024-06-05	10	2024-06-15
Testing	2024-06-12	15	2024-06-26
Deployment	2024-06-27	5	2024-07-01
Maintenance & Support	2024-07-02	5	2024_07-07

Here's a detailed project plan represented by a Gantt chart:

1. ***Initiate Project***: Define project scope, objectives, and stakeholders.
2. ***Gather Requirements***: Collect and document system requirements from stakeholders.
3. ***Design System***: Create system architecture, wireframes, and database schema.
4. ***Develop Frontend***: Implement frontend interfaces using HTML, CSS, and JavaScript.
5. ***Develop Backend:*** Develop backend application logic using a chosen framework.

6. ***Set up Database***: Create and configure the database, implement data models.
7. ***Testing:*** Conduct unit testing, integration testing, and user acceptance testing.
8. ***Deployment***: Prepare deployment environment and deploy the system to production.
9. ***Maintenance & Support***: Provide ongoing maintenance and support for the system.

METHODLOGY:

For the implementation of the Student Report Card Management System project, the Agile methodology can be adopted. Agile is well-suited for software development projects that require flexibility, collaboration, and incremental delivery. Here's how Agile can be applied to the system implementation:

Agile Methodology for System Implementation:

*1. **Sprint Planning**:*

Prioritize tasks based on their importance and dependencies.
Select a subset of tasks to be completed during each sprint, typically last
Break down the project into smaller, manageable tasks or user stories.
in 1-4 weeks.

*2. **Daily Stand-up Meetings**:*

Conduct daily stand-up meetings to discuss progress, challenges, and plans for the day. Each team member provides updates on what they accomplished yesterday, what they plan to do today, and any blockers they are facing.

*3. **Iterative Development**:*

Implement features in short iterations or sprints, with a focus on delivering working software at the end of each iteration.

- Gather feedback from stakeholders at the end of each sprint to inform subsequent iterations.

4. **Continuous Integration and Testing**:

Integrate code changes frequently to ensure that new features are compatible with the existing codebase Conduct automated and manual testing throughout the development process to identify and fix bugs early.

5. **Collaboration and Communication**:

Foster collaboration among team members, stakeholders, and end-users throughout the project.Maintain open communication channels to address issues, gather feedback, and make decisions collaboratively.

6. **Adaptability and Flexibility**:

Embrace changes to requirements and priorities as they arise, responding quickly to feedback and evolving needs. Continuously improve processes and practices based on lessons learned from each sprint.

7. **Product Increment**:

At the end of each sprint, deliver a potentially shippable product increment that adds value to the system. Review and prioritize the backlog based on feedback and changing priorities to determine the scope of the next sprint.

Benefits of Agile Methodology:

- **Flexibility**: Agile allows for changes to be accommodated throughout the project, enabling the system to adapt to evolving requirements and feedback.
- **Transparency**: Regular meetings and progress updates provide transparency into the project's status and allow stakeholders to track progress.
- **Customer Satisfaction**: Continuous delivery of working software and frequent feedback cycles ensure that the system meets the needs and expectations of stakeholders.
- **Risk Mitigation**: By delivering functionality incrementally, risks associated with large-scale deployment are reduced, and issues can be identified and addressed early in the development process.

By adopting Agile methodology for system implementation, the Student Report Card Management System project can achieve efficient development, effective collaboration, and successful delivery of a high-quality product that meets the needs of users and stakeholders.

HARDWARE AND SOFTWARE REQUIRMENTS:

using Java for the development of the Student Report Card Management System project, here are the details of the hardware and software you'll typically need:

- ***Hardware:***

1. **Development Machine**:

- A modern computer with sufficient processing power, RAM, and storage capacity to support Java development tasks efficiently.
- Specifications may vary based on individual preferences, but typically a multi-core processor, 8GB or more of RAM, and SSD storage are recommended.

2. **Server** (for deployment):

- A server for hosting the web application in a production environment.
- Specifications depend on factors such as expected traffic, concurrent users, and scalability requirements.
- Cloud-based solutions such as AWS EC2, Google Cloud Compute Engine, or Azure Virtual Machines can be used.

3. **Database Server**:

- A separate server or database instance to host the database management system (DBMS).
- The choice of database server depends on the selected DBMS (e.g., MySQL, PostgreSQL).

- ***SOFTWARE:***

1. **Integrated Development Environment (IDE)**: - Use an IDE for Java development that provides features like code editing, debugging, and project management.

- Popular choices include IntelliJ IDEA, Eclipse, and NetBeans.

2. **Java Development Kit (JDK)**:

- Install the JDK, which includes the Java compiler (javac), runtime environment (JRE), and other tools necessary for Java development.
- Ensure that you have the appropriate JDK version for your project (e.g., JDK 11, JDK 15).

3. **Java Frameworks**:

- Choose Java frameworks or libraries to build the backend of your application.
- Frameworks like Spring Boot, Jakarta EE (formerly Java EE), or Apache Struts can be used for building web applications.

4. **Database Management System (DBMS)**:

- Choose a DBMS for storing and managing student data.
- Java provides database connectivity through JDBC (Java Database Connectivity), allowing you to interact with databases such as MySQL, PostgreSQL, Oracle, or SQLite.

5. **Web Server**:

- Use a web server software for hosting the Java web application.
- Apache Tomcat is a popular choice for deploying Java web applications, but other options like Jetty or WildFly (formerly JBoss) can also be considered.

6. **Testing Tools**:

- Utilize testing frameworks and libraries for automated testing of Java components.
- JUnit is a widely used framework for unit testing Java code, while tools like Selenium can be used for automated testing of web applications.

7***. **Build Tools**:***

- Use build tools to automate the compilation, packaging, and deployment of Java applications.Apache Maven and Gradle are popular build automation tools for Java projects.

- ***Development Environment Setup:***

Set up your development environment by installing the necessary software components on your development machine. Configure your IDE to work with

Java and your chosen frameworks. Use version control (e.g., Git) to manage code changes and collaborate with team members.

- Continuously test and debug your Java application during development to ensure functionality and performance.

By leveraging Java and the appropriate hardware and software components, you can effectively develop the Student Report Card Management System, meeting the project's requirements and objectives.

JUSTIFICATION OF SOFTWARE:

justification for the choice of software for the front end, back end, and report designer components of the Student Report Card Management System project:

- ***Front End:***

*****Justification**:***

1. **Ease of Development**: React.js is a popular JavaScript library for building user interfaces, known for its simplicity and reusability of components. Its component-based architecture allows for efficient development and maintenance of complex UIs.

2. **Performance**: React.js utilizes a virtual DOM and efficient rendering algorithms, resulting in fast and responsive user interfaces. This is crucial for an application where users expect real-time updates and interactions.

3. **Community Support**: React.js has a large and active community of developers, providing a wealth of resources, tutorials, and third-party libraries to accelerate development and address common challenges.

4. **Scalability*: React.js is well-suited for scalable applications, enabling developers to build modular and scalable UI components that can be easily extended and reused as the project grows.

- ***Back End:***

Choice (Java)

*****Justification**:***

1. **Java Ecosystem**: Java is a widely-used programming language with a mature ecosystem and robust libraries for enterprise application development. Spring Boot, as a Java framework, offers extensive features for building scalable and secure web applications.

2***. **Ease of Development**:*** Spring Boot simplifies the development of Java-based web applications by providing auto-configuration, dependency injection, and out-of-the-box support for common tasks such as database access, security, and RESTful APIs.

3***. **Security**:*** Spring Boot offers robust security features, including authentication, authorization, and encryption, which are essential for protecting sensitive student data in the application.

4.**Integration**: Spring Boot seamlessly integrates with other technologies commonly used in Java development, such as Hibernate for ORM (Object-Relational Mapping) and Spring Security for authentication and authorization.

Report Designer:

Justification:

1. **Feature-Rich**: Jasper Reports is a powerful open-source reporting tool with comprehensive features for designing, generating, and exporting reports in various formats (e.g., PDF, Excel, HTML).

2. **Ease of Use**: Jasper Reports provides a user-friendly graphical interface for designing reports, allowing developers to create complex report layouts with drag-and-drop functionality and WYSIWYG editing.

3. **Integration**: Jasper Reports can be easily integrated into Java applications, including Spring Boot, using its Java API. This allows for seamless generation and embedding of reports within the Student Report Card Management System.

4. **Community Support**: Jasper Reports has a large community of users and contributors, providing extensive documentation, tutorials, and forums for support and troubleshooting.

- ***Overall Justification***:

The chosen software tools for the front end, back end, and report designer components of the Student Report Card Management System project were selected based on their suitability for the project requirements, ease of development, scalability, security, and community support. By leveraging React.js for the front end, Spring Boot for the back end, and Jasper Reports for report generation, the project can benefit from robust, scalable, and feature-rich solutions that meet the needs of users.

HARDWARE AND SOFTWARE REQUIRMENTS OF USER SIDE:

To run the Student Report Card Management System project at the user end, both hardware and software requirements must be met. Here's an overview of the hardware and software needed:

➢ ***Hardware Requirements:***

1. **Computer**:

- A desktop, laptop, or tablet device with a modern web browser installed.

2. **Internet Connection**:

A stable internet connection is required to access the web-based application.

➢ ***Software Requirements:***

1. **Web Browser**:

- The application should be compatible with modern web browsers such as:

- Google Chrome

- Mozilla Firefox

- Safari

- Microsoft Edge

- Opera

2. **Operating System**:

The application should be platform-independent and accessible from any operating system, including:

- ***Windows***
- ***macOS***
- ***Linux***

3. **Java Runtime Environment (JRE)** (if applicable):

If the project utilizes Java for the front end or back end, the user may need to have the appropriate version of the JRE installed.

4. **PDF Viewer**:

To view and print generated reports, users may need a PDF viewer application installed on their device. Most modern web browsers have built-in PDF viewers, but standalone PDF viewer software can also be used.

➢ ***Optional Requirements:***

1. **Mobile App**:

If the project includes a mobile application component, users may need to download and install the corresponding mobile app from the relevant app store (e.g., Google Play Store for Android, Apple App Store for iOS).

2. **Authentication Credentials**:

- Users may need to create an account and log in to access certain features or data within the application. In this case, they will need valid authentication credentials (username and password).

By ensuring that users have the necessary hardware and software requirements, the Student Report Card Management System project can be accessed and utilized effectively, providing a seamless user experience for teachers, students, parents, and administrators.

SECURITY ISSUES:

Let's delve to deeper into each of these specific areas:

1. **Operating System (OS) Level Security**:

- Ensure that the operating system hosting the student report card management system is properly hardened and regularly updated with security patches.

- Implement strong access controls at the OS level to restrict unauthorized access to system files and directories.

- Utilize firewalls and intrusion detection/prevention systems to monitor and control network traffic to and from the system.

2. ***Database Security**:***

Apply the principle of least privilege when configuring database access permissions, granting users only the minimum privileges necessary to perform their tasks.

Encrypt sensitive data stored in the database to prevent unauthorized access in case of a breach.

Implement database auditing to track and monitor access to sensitive data and database activities.

3. **Access Permissions**:

Enforce strict access controls within the application to ensure that users can only access data and perform actions that they are authorized to.

- Implement role-based access control (RBAC) to manage user permissions effectively, assigning roles based on job responsibilities and privileges.

- Regularly review and update access permissions to revoke unnecessary privileges and mitigate the risk of privilege escalation attacks.

4. **Form/Web Page Security**:

- Apply input validation and sanitization techniques to all web forms and pages to prevent common vulnerabilities such as XSS, SQL injection, and CSRF attacks.

- Implement measures such as CAPTCHA or reCAPTCHA to protect against automated form submissions and spam.

- Regularly test the security of web pages and forms using vulnerability scanners and penetration testing tools to identify and remediate potential security issues.

5. **Authorization**:

Implement granular authorization mechanisms to control access to different parts of the application based on user roles and permissions.

Enforce access controls at both the application level and the server level to prevent unauthorized access to sensitive resources and functionality.

Utilize secure session management techniques to maintain user authentication and authorization state securely throughout the user session.

6. **Security of User ID and Password**:

- Store user passwords securely using strong cryptographic hashing algorithms (e.g., b crypt, Argon2) with salt to protect against password cracking attacks.

- Enforce password policies such as minimum length, complexity requirements, and regular password expiration to enhance password security.

Implement secure password recovery mechanisms, such as email-based password reset with verification codes, to prevent unauthorized password resets.

By addressing these security considerations at each level of the student report card management system, you can establish a robust security posture and mitigate the risk of security breaches and unauthorized access. Regular security assessments and audits should also be conducted to identify and remediate any new security vulnerabilities that may arise over time.

SCOPE SYSTEM MAINTENANCE & EVOLUTION:

The scope of system maintenance and evolution for a student report card management system project encompasses various activities aimed at ensuring the system's ongoing functionality, security, and alignment with evolving user needs. Here's a detailed breakdown of the scope:

1. **Bug Fixes and Issue Resolution**:

- Regularly monitor the system for bugs, errors, and anomalies reported by users or detected through system monitoring tools.

- Prioritize and address reported issues promptly to maintain system reliability and user satisfaction.

2. **Software Updates and Upgrades**:

Stay abreast of updates and new releases for the system's underlying software components, including operating systems, databases, web servers, and programming frameworks.

Plan and execute software updates and upgrades in a controlled manner to leverage new features, performance improvements, and security patches.

3. **Performance Optimization**:

Continuously assess and optimize the system's performance to ensure responsive user experience and efficient resource utilization.Identify and address performance bottlenecks through code optimizations, database tuning, caching strategies, and infrastructure scaling as needed.

4. **Security Enhancements**:

Implement proactive security measures to protect the system against potential threats and vulnerabilities.

Conduct regular security audits, vulnerability assessments, and penetration testing to identify and remediate security weaknesses.

Enhance access controls, encryption mechanisms, and security protocols to safeguard sensitive data and prevent unauthorized access.

5. **Feature Enhancements and Functional Updates**:

Prioritize and implement feature enhancements based on user needs, business requirements, and strategic objectives. Leverage agile development methodologies to iteratively introduce new features and updates in response to changing demands.

6. **Data Management and Governance**:

Implement data management policies and procedures to ensure the integrity, availability, and confidentiality of student records and academic data.

7. **User Training and Support**:

Provide comprehensive user training materials, documentation, and support resources to empower users to effectively utilize the system's features and functionalities.

8**Continuous Monitoring and Feedback**:

Establish mechanisms for continuous monitoring of system performance, user engagement, and feedback channels to identify areas for improvement.

COST AND BENEFIT ANALYSIS:

Performing a cost and benefit analysis of a student report card management system project involving development implementation, and maintenance anticipated benefits and returns on investment (ROI).

➢ ***Costs**:**

*a. **Development Costs**:*

Include expenses related to software development, such as: Salaries and wages of developers, designers, and project managers. Software licenses and development tools. Outsourced development services, if applicable.

*b. **Infrastructure Costs**:*

Account for expenses associated with hardware, software, and network infrastructure: Servers, computers, and networking equipment. database licenses and hosting fees.

c. ***Implementation Costs***:

Consider expenses related to system deployment and integration:

Training and onboarding of users and administrators. Data migration and integration with existing systems.

d. ***Maintenance and Support Costs***

Include ongoing expenses for system maintenance, updates, and support Software maintenance fees. IT support and helpdesk service Security updates and patches.

*e. **Operational Costs**:*

Factor in ongoing operational expenses, such as:

Electricity and utilities.

System backups and disaster recovery.

Regulatory compliance costs.

➢ 2. **Benefits**:

a. **Efficiency Gains**:

Evaluate the potential time and cost savings achieved through automation and streamlining of administrative tasks related to report card management.

b. **Improved Accuracy**:

Consider the reduction in errors and inaccuracies in report generation and data management, leading to improved data quality and reliability.

c. **Enhanced Visibility and Access**:

Assess the benefits of improved access to student data for teachers, administrators, parents, and students themselves, enabling better decision-making and collaboration.

d. **Time Savings**:

Estimate the time saved by teachers and administrators in preparing, distributing, and managing report cards, allowing them to focus more on teaching and student support.

3. **ROI Calculation**:

$$ROI = (NET\ BENEFIT / TOTAL\ COST) \times 100\%$$

Where, Net Benefits = Total Benefits - Total Costs

4. **Qualitative Analysis**:

In addition to quantitative metrics, consider qualitative factors such as:

- Improved student outcomes and academic performance.

- Increased teacher satisfaction and morale.

- Enhanced reputation and competitiveness of the educational institution.

- Future scalability and adaptability of the system to evolving needs and technologies.

*5. **Sensitivity Analysis**:*

Conduct sensitivity analysis to assess the impact of variations in key assumptions and variables (e.g., adoption rate, cost of resources) on the project's financial viability and ROI.

SYSTEM DESIGN:

DFD (DATA FLOW DIAGRAM):

DFD stands for Data Flow Diagram. It's a graphical representation of the flow of data through a system, illustrating how data is input into the system, processed, and output from the system. DFDs are commonly used in software engineering and systems analysis to visualize and understand the structure and behaviour of a system.

There are several symbols used in DFDs to represent different elements and processes within the system:

External Entity:

External entities represent sources or destinations of data outside the system. They are typically depicted as rectangles. Examples of external entities include users, other systems, or data sources.

Process:

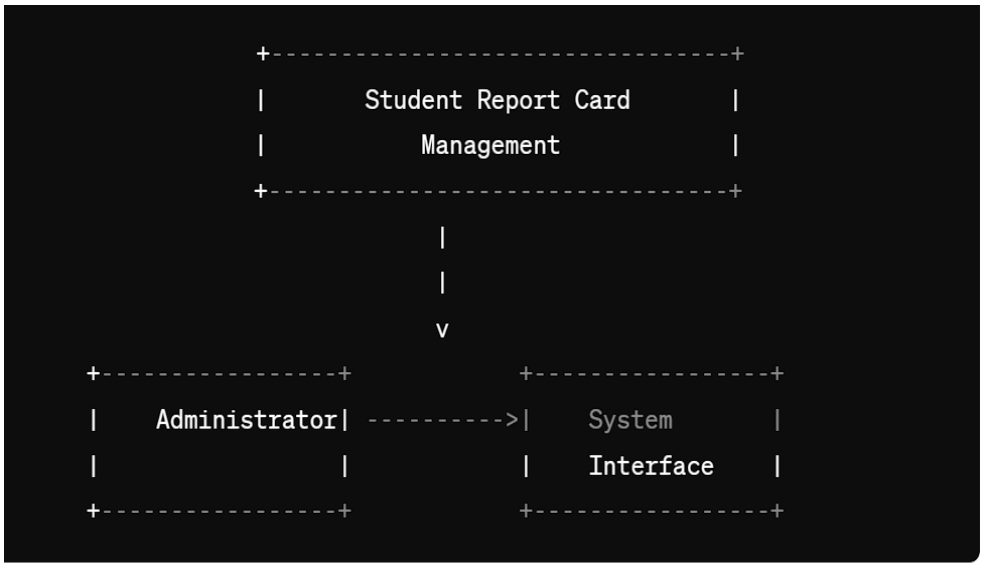
Processes represent the transformations or actions that occur within the system. They are typically depicted as circles or rectangles with rounded corners. Processes take input data, perform some processing, and produce output data.

Data Flow:

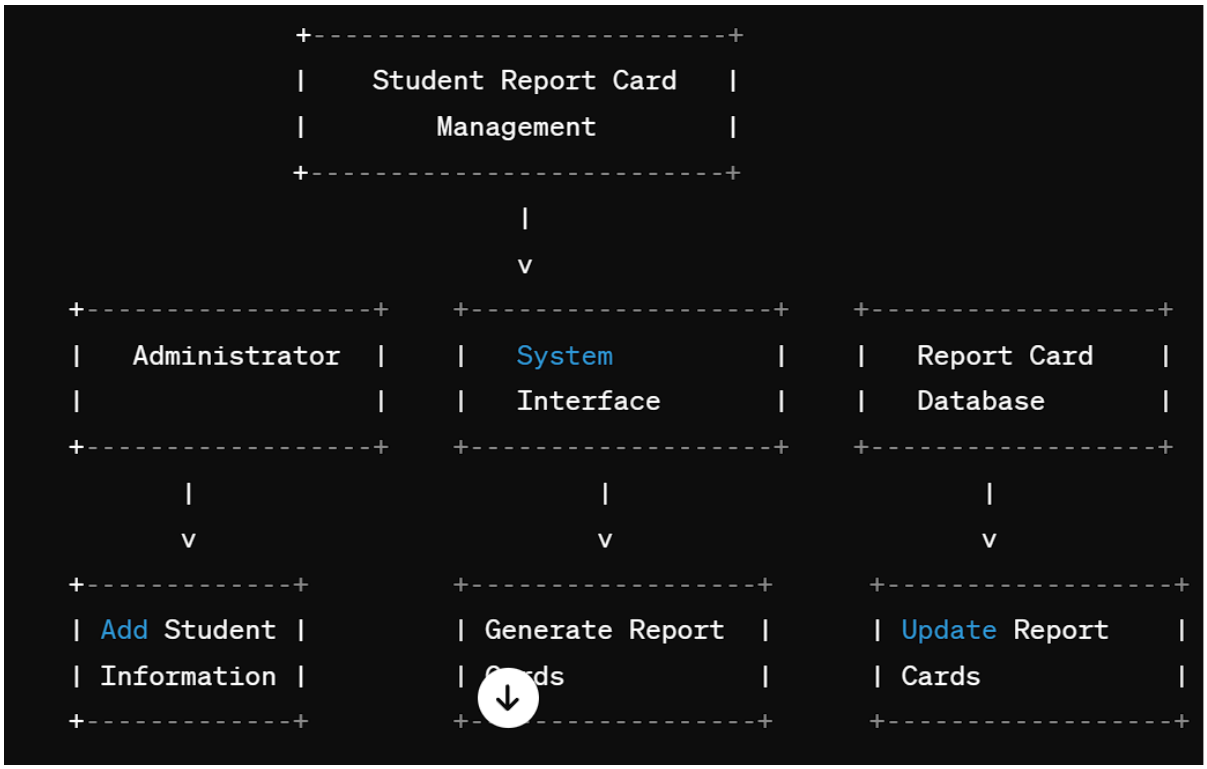
Data flows represent the movement of data between various elements of the system. They are depicted as arrows, indicating the direction of data flow. Data flows show how data is passed between processes, external entities, and data stores.

Data Store: Data stores represent repositories of data within the system. They can be files, databases, or any other storage mechanism.Data stores are depicted as two parallel horizontal lines.

DFD level 0 (context level diagram):



DFD LEVEL 1:



ER- DIAGRAM:

An Entity-Relationship Diagram (ERD) is a visual representation of the data model that describes how different entities are related to each other within a system. It's commonly used in database design to illustrate the structure of a database and the relationships between entities.

Let's break down the key components of an ERD:

1. ***Entity:***

   An entity is a real-world object or concept that has attributes and can be uniquely identified. In the context of a database, an entity typically corresponds to a table. For example, in a student report card management system, entities could include Student, Subject, ReportCard, etc.

2. ***Attributes:***

   Attributes are properties or characteristics of an entity that describe it. Each entity has one or more attributes that represent its data. For instance, a Student entity may have attributes like Student ID, Name, Class, etc. Attributes are represented as columns in a database table.

3. ***Relationship***:

   A relationship defines how entities are related to each other. It describes how data from one entity is linked to data in another entity. Relationships can be one-to-one, one-to-many, or many-to-many. In an ERD, relationships are represented by lines connecting entities, with labels indicating the nature of the relationship.

ENTITY RELATIONSHIP DIAGRAM:

This diagram illustrates the entities (Student, ReportCard, Subject, and Grade) and their relationships in the student report card management system. Each entity has its attributes, and the relationships between them are represented by lines connecting them.

an Entity-Relationship Diagram (ERD) for the student report card management system based on the provided requirements.

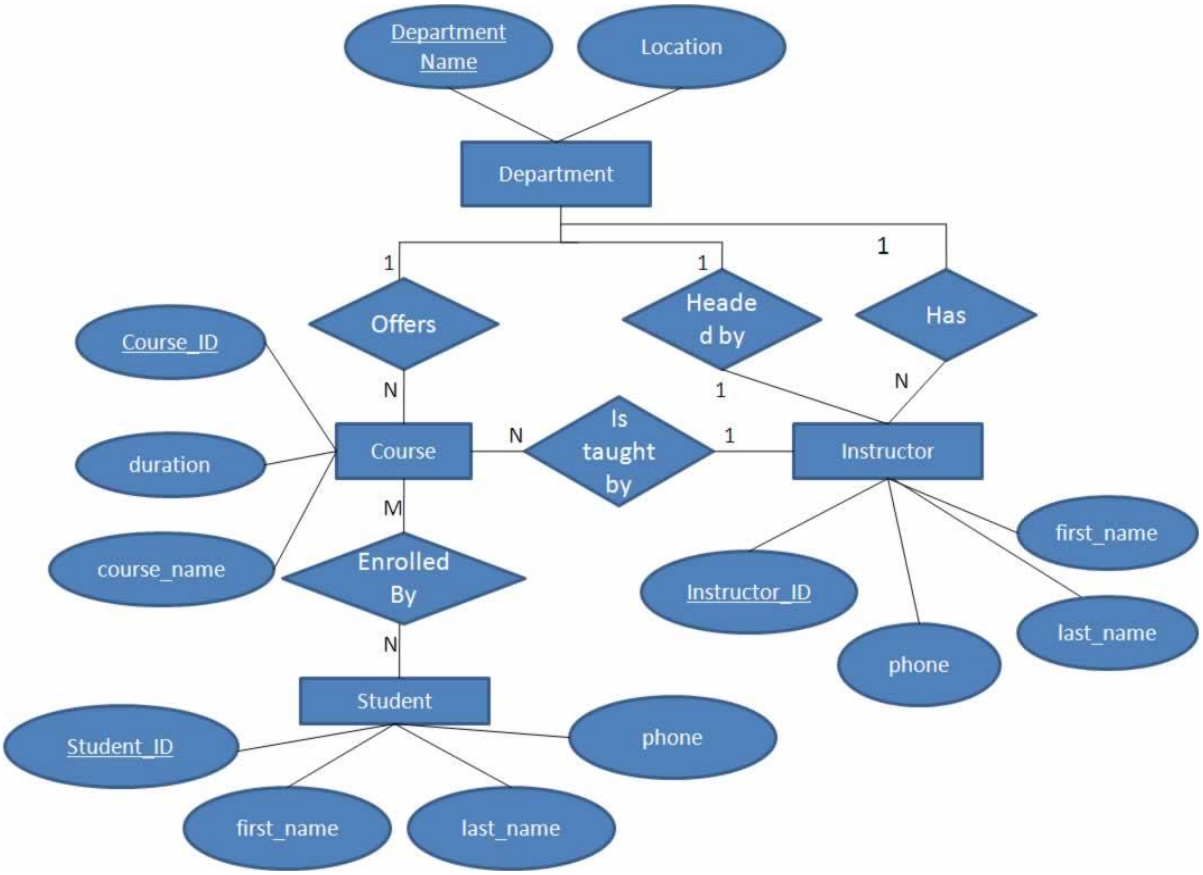
Entities:

1. *Student*
    - Attributes: StudentID (Primary Key), Name, Class
2. *Subject*
    - Attributes: SubjectID (Primary Key), Name
3. *ReportCard*
    - Attributes: ReportCardID (Primary Key), StudentID (Foreign Key), Semester
4. *Grade*
    - Attributes: GradeID (Primary Key), ReportCardID (Foreign Key), SubjectID (Foreign Key), Grade

Relationships:

1. Each Student can have multiple ReportCards.
    - One-to-Many relationship between Student and ReportCard.
2. Each ReportCard belongs to one Student.
    - Many-to-One relationship between ReportCard and Student.
3. Each ReportCard contains grades for multiple Subjects.
    - One-to-Many relationship between ReportCard and Grade.
4. Each Grade belongs to one ReportCard.
    - Many-to-One relationship between Grade and ReportCard.
5. Each Grade is associated with one Subject.

- Many-to-One relationship between Grade and Subject.



TABLES DESIGN:

```
CREATE TABLE Student (
    StudentID INT PRIMARY KEY,
    Name VARCHAR(100),
    Class VARCHAR(50)
);

CREATE TABLE Subject (
    SubjectID INT PRIMARY KEY,
    Name VARCHAR(100)
```

```
);

CREATE TABLE ReportCard (
    ReportCardID INT PRIMARY KEY,
    StudentID INT,
    Semester VARCHAR(20),
    FOREIGN KEY (StudentID) REFERENCES Student(StudentID)
);

CREATE TABLE Grade (
    GradeID INT PRIMARY KEY,
    ReportCardID INT,
    SubjectID INT,
    Grade VARCHAR(5),
    FOREIGN KEY (ReportCardID) REFERENCES ReportCard(ReportCardID),
    FOREIGN KEY (SubjectID) REFERENCES Subject(SubjectID)
);
```

OUTPUT:

Student ID	Name	Subject 1	Subject 2	Subject 3	Subject 4	Total	Percentage	Grade
001	John Doe	85	90	78	92	345	86.25	A
002	Jane Smith	92	88	95	87	362	90.5	A
003	Alice Lee	78	85	80	82	325	81.25	B
...	...	...	...	...	...	...	...	...

SOFTWARE ENGINEERING PROCESS:

The development of a Student Report Card Management System would typically involve several stages of the software engineering process. Here's a breakdown of the key stages and their involvement in the project:

1***. **Requirement Analysis:****

Understanding the needs and requirements of the system from stakeholders (teachers, administrators, students, etc.).Identifying functional and non-functional requirements such as user authentication, data security, and report generation.

2. **System Design:*

Designing the overall system architecture, including database design, user interface design, and system modules. Creating Entity-Relationship Diagrams (ERDs) to model the database schema. Defining the structure of the user interface and interactions.

3. ***Implementation:****

Writing code to implement the system based on the design specifications. Developing modules for functionalities such as user authentication, data input, calculation of grades, and report generation. Integrating different components of the system and ensuring they work together seamlessly.

4. **Testing:*

Performing unit testing to ensure individual modules function correctly. Conducting integration testing to verify the interaction between different modules. Carrying out system testing to validate that the system meets the specified requirements. Performing user acceptance testing (UAT) to gather feedback from end-users and make necessary adjustments.

5. **Deployment:*

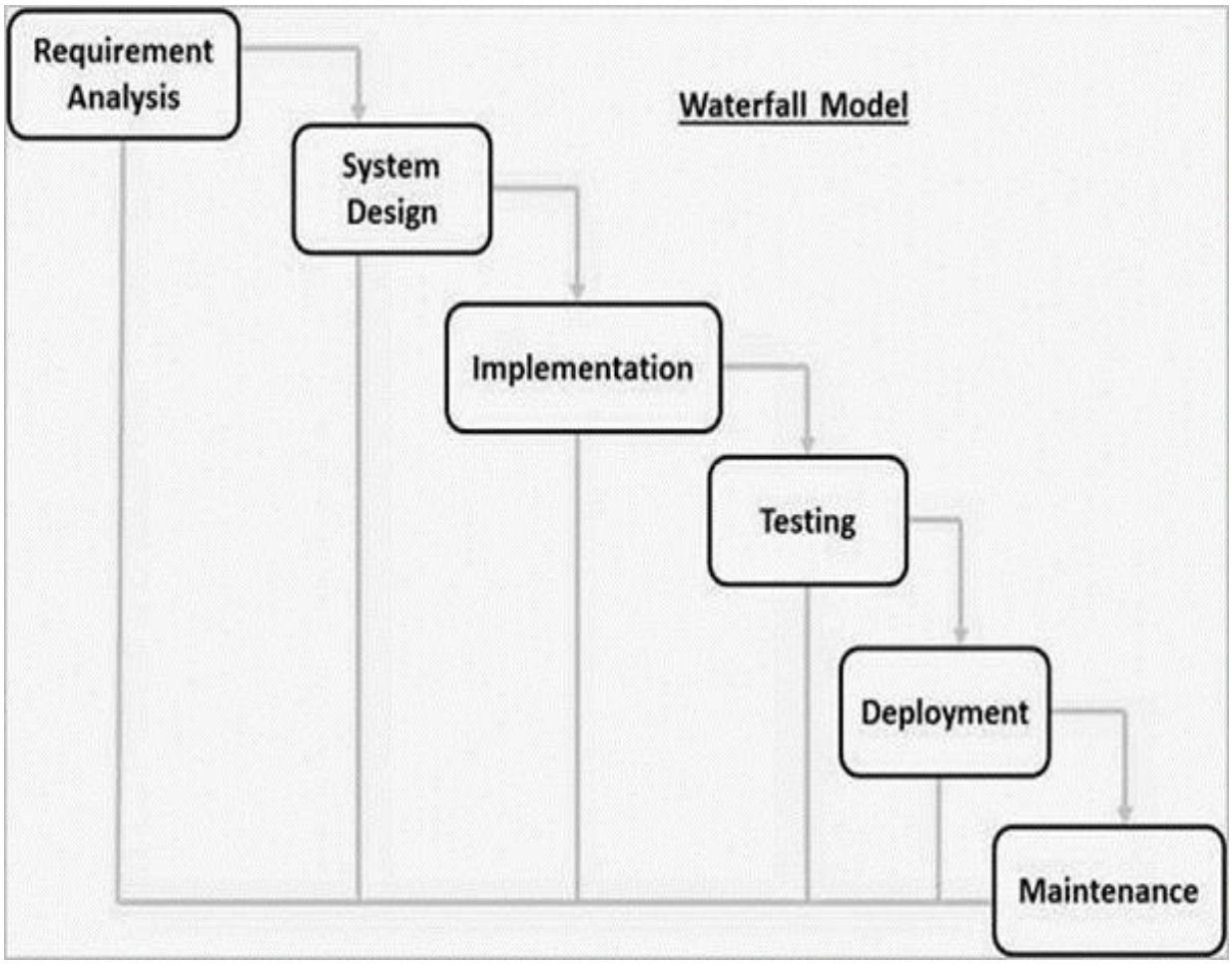
Deploying the system to the production environment, which may involve setting up servers, databases, and other infrastructure.

Ensuring that the system is accessible to users and meets performance requirements. Providing necessary training to users on how to use the system effectively.

6. **Maintenance and Support:*

Providing ongoing support for the system, including bug fixes, updates, and enhancements. Monitoring system performance and addressing any issues that arise. Incorporating feedback from users to improve the system over time.

Throughout these stages, it's crucial to follow software engineering best practices such as version control, documentation, and collaboration among team members to ensure the successful development and deployment of the Student Report Card Management System.



CODING:

1. **HTML Form (index.html)**:

```
<!DOCTYPE html>
<html>
<head>
    <title>Simple Form</title>
<I><B><h3>REGISTRATION FORM FOR THE SESSION OF:2023-
2024</h3></B></I>
<title>REGISTRATION FORM</title>
</head>
<body bgcolor="lightskyblue">
    <form
method="post"action="mailto:susomsanyal1972@gmail.com">
        FIRST NAME:</first><br>
  <input type="text"name="First name"><br>
  LAST NAME:</last><br>
  <input type="text"name="last name"><br>
FATHER NAME:<br>
<input type="text"name="father name="><br>
ADDRESS:<br>
<textarea name="adress"cols="80"row="5"></textarea><br>
GENDER:<br>
    <input type="radio" name="Gender"value="Male">Male<br>
    <input type="radio"
name="Gender"value="female">female<br>
    <input type="radio" name="Gender"value="other">other<br>
    DATE OF BIRTH:<br>
 <input type="text"name="date of birth"><br>
    AADDHAR NUMBER:<br>
    <input type="text"name="Aaddhar number"><br>
    PHONE NUMBER:<br>
 <input type="text"name="country code"value=+91><br>
 STUDYING in:<br>
 <select>
```

```
 <option value="course">course</option>
 <option value="BCA">BCA</option>
 <option value="BBA">BBA</option>
  <Option value="B.SC">B.SC</option>
<option value="BENGALI">BENGALI</option>
 <option value="OTHER">OTHER</option>
 <option value="MCA">MCA</option>
 <option value="B.TECH">B.TECH</option>
 <option value="M.TECH">M.TECH</option>
 </select><br>
 COLLEGE NAME:<BR>
<select>
<option value="college">college</option>
 <option value="BB COLLEGE">BB COLLEGE</option>
<option value="BC COLLEGE">BC COLLEGE</option>
<option value="TDB COLLEGE">TDB COLLEGE</option>
<option value="JADAVPUR">JADAVPUR</option>
<option value="ASANSOL ENGINEERING COLLEGE">ASANSOL
ENGINEERING COLLEGE</option>
</select><br>
 PASSWORD:<BR>
<input type="password" id="pass"name="pass"><br>
RE-TYPE PASSWORD:<br>
<input type="password" id="repass"name="repass"><br>
<input type="button"value="submit"><br>
<input type="button"value="reset"><br>
</form>
</body>
</html>
</head>
<body>
    <h2>Simple Form</h2>
    <form action="FormHandlerServlet" method="post">
        <label for="name">Name:</label>
        <input type="text" id="name" name="name"
required><br><br>
```

```
        <label for="email">Email:</label>
        <input type="email" id="email" name="email"
required><br><br>

        <label for="message">Message:</label><br>
        <textarea id="message" name="message" rows="4"
cols="50" required></textarea><br><br>

        <input type="submit" value="Submit">
    </form>
</body>
</html>
```

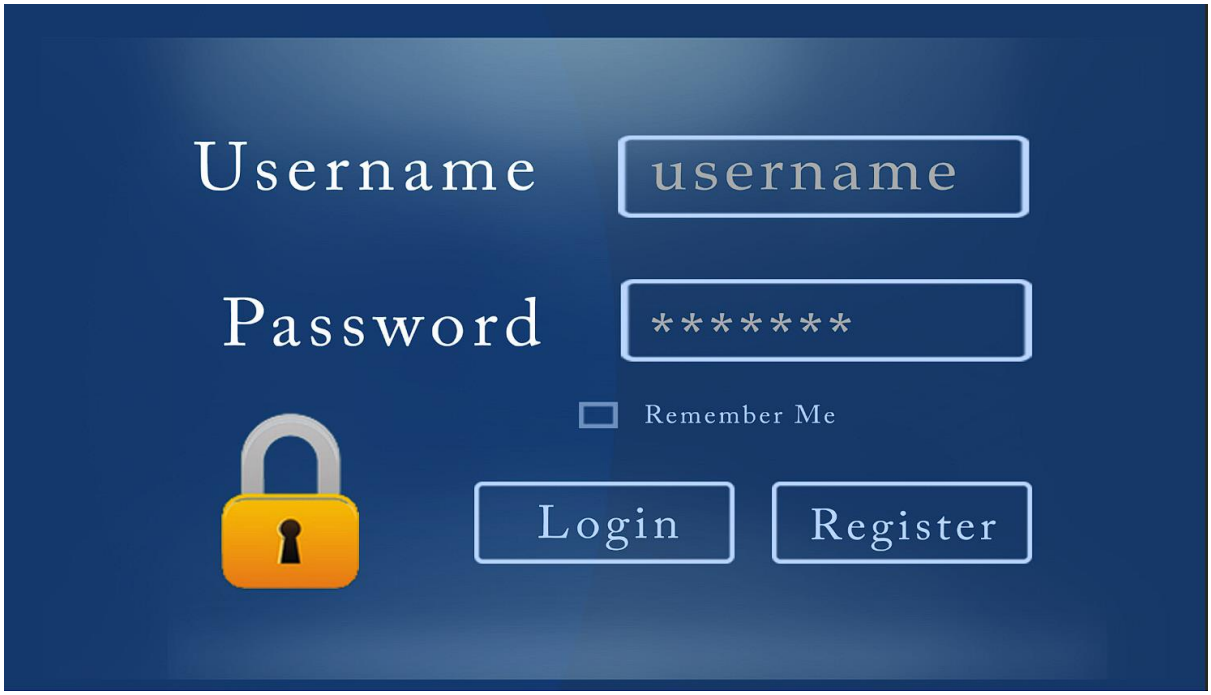
2. *Java Servlet (FormHandlerServlet.java):*

```
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;

public class ReportCardServlet extends HttpServlet {
    public void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
        response.setContentType("text/html");
        PrintWriter out = response.getWriter();

        // Retrieve grades from form submission
        int mathGrade = Integer.parseInt(request.getParameter("math"));
        int scienceGrade =
Integer.parseInt(request.getParameter("science"));
        int englishGrade =
Integer.parseInt(request.getParameter("english"));

        // Calculate average grade
        double averageGrade = (mathGrade + scienceGrade + englishGrade)
/ 3.0;

        // Display report card
        out.println("<!DOCTYPE html>");
```

```
        out.println("<html><head><title>Report
Card</title></head><body>");
        out.println("<h2>Report Card</h2>");
        out.println("<p>Math Grade: " + mathGrade + "</p>");
        out.println("<p>Science Grade: " + scienceGrade + "</p>");
        out.println("<p>English Grade: " + englishGrade + "</p>");
        out.println("<p>Average Grade: " + averageGrade + "</p>");
        out.println("</body></html>");

        out.close();
    }
}
```

SCREENSHOTS:

- ***LOG IN PAGE OF THE STUDENT:***



➢ *REGISTRATION PAGE (FOR WHO HAVE NOT REGISTERED):*

REGISTRATION FORM FOR THE SESSION OF:2023-2024

FIRST NAME:

LAST NAME:

FATHER NAME:

ADDRESS:

GENDER:

- Male
- female
- other

DATE OF BIRTH:

AADDHAR NUMBER:

PHONE NUMBER:
+91

STUDYING in:
course

COLLEGE NAME:
college

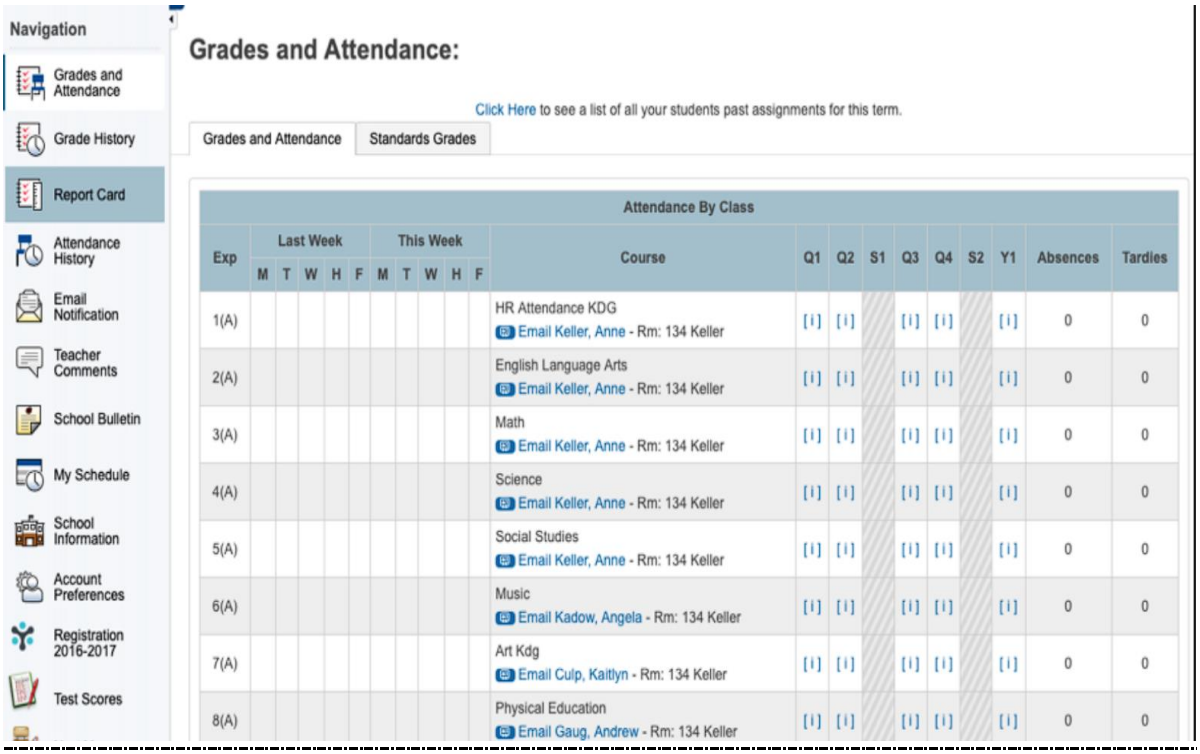
PASSWORD:

RE-TYPE PASSWORD:

submit
reset

➢ ***HOME PAGE:***

➢ ***GRADES OF STUDENT:***



SOFTWARE TESTING METHODOLOGY:

In a student report card management system project, testing is crucial to ensure the system functions correctly, securely, and efficiently. Here's a methodology you could use for testing:

1. **Requirement Analysis**:

Understand the project requirements thoroughly. This includes functional requirements (what the system should do) and non-functional requirements (performance, security, usability, etc.).

2. **Test Planning**:

Develop a test plan outlining the testing approach, scope, objectives, resources, and timelines. Identify the types of testing to be conducted, such as functional testing, performance testing, security testing, etc.

3. ***Test Case Design**:***

Create test cases based on the requirements. Test cases should cover both positive and negative scenarios, boundary conditions, and user interactions. Each test case should have clear steps, expected results, and criteria for pass/fail.

➢ ***Functional Testing***:

- ***Unit Testing**:***

Test individual components/modules of the system to ensure they function correctly in isolation.

- **Integration Testing**:

Test the integration of different modules to ensure they work together as expected.

- **System Testing:**

Test the entire system to ensure it meets the functional requirements.

➢ ***NON FUNCTIONAL TESTING:***

- ***Performance Testing**:**

Evaluate the system's performance under different load conditions to ensure it can handle multiple users and concurrent operations.

- **Security Testing**:

Identify and address security vulnerabilities such as data breaches, unauthorized access, etc.

- ***Usability Testing**:**

Assess the user interface for ease of use, intuitiveness, and accessibility.

6. **Regression Testing:** After making any changes or enhancements to the system, rerun the test cases to ensure that existing functionalities are not affected.

7. **User Acceptance Testing (UAT)**: Involve end-users (administrators, teachers, students) to validate whether the system meets their requirements and expectations.

8. **Bug Tracking and Reporting**: Document any defects or issues encountered during testing, including steps to reproduce them and their severity.

9. **Test Automation**: Consider automating repetitive test cases to streamline the testing process and improve efficiency.

10. **Documentation**: Maintain comprehensive documentation of the testing process, including test plans, test cases, test results, and any identified issues or enhancements.

11. **Feedback and Iteration**: Gather feedback from stakeholders and incorporate any necessary changes or improvements into the system.

- ***TEST REPORT OF THIS PROJECT:***

Creating a test report for a student report card management system project involves documenting the testing process, results, and any issues encountered.

Here's a template you can follow:

Test Report: Student Report Card Management System Project a unit testing report might look, f ocusing on scenarios such as wrong date format and character input instead of numbers:

*******Unit Testing Report: Student Report Card Management System*****

Date: [Date of Testing]

Testers: [List of Testers]

Test Environment:

- Operating System: Windows 10
- Development Environment: Visual Studio Code
- Programming Language: Python
- Framework: Django

Summary:

This unit testing report focuses on testing various functionalities of the Student Report Card Management System at the unit level. The testing primarily includes scenarios related to date format validation and input validation for numerical fields.

Test Cases Executed:

- **Total Test Cases:** [Total Number of Test Cases]

- **Pass:** [Number of Test Cases Passed]

- **Fail:** [Number of Test Cases Failed]

- **Pending:** [Number of Test Cases Pending]

Test Cases:

1. **Date Format Validation:**

   - **Test Case ID:** UT001

   - **Test Description:** Verify that the system correctly validates the date format entered by the user.

   - **Preconditions:** The system is accessible.

   - **Test Steps:**

     1. Enter a date in an incorrect format (e.g., "April 15, 2024").

     2. Attempt to save the date.

   - **Expected Result:** The system should display an error message indicating that the date format is incorrect.

   - **Actual Result:** [Pass/Fail]

2. **Input Validation - Numerical Fields:**

   - **Test Case ID:** UT002

   - **Test Description:** Verify that the system properly handles character input in numerical fields.

   - **Preconditions:** The system is accessible.

   - **Test Steps:**

     1. Enter a character (e.g., "a") in a numerical field (e.g., "Grade").

     2. Attempt to save the form.

- **Expected Result:** The system should display an error message indicating that only numerical input is allowed.

- **Actual Result:** [Pass/Fail]

Multi-User Testing:

- **Test Description:** The system was tested in a multi-user environment to ensure that it can handle concurrent operations by multiple users without data corruption or inconsistency.

- **Test Results:** [Summary of Multi-User Testing Results]

***Conclusion:**:

The unit testing process identified issues related to date format validation and input validation for numerical fields. These issues need to be addressed to ensure the system's reliability and data integrity. Overall, the system performed satisfactorily in a multi-user environment, with no significant issues observed.

PERFORMANCE AND EFFICIENCY:

Performance and Efficiency Issues:

1. ***Slow Response Times:***
   Operations like login and report generation are sluggish.
2. ***Resource Overconsumption:***
   The system uses excessive CPU, memory, or network resources.
3. ***Database Bottlenecks:***
4. Slow database queries affect overall system performance.
5. ***Inefficient Algorithms:***
6. Some operations are inefficient, impacting system speed.

.

*6.**UI Responsiveness:***

The user interface is unresponsive at times.

Addressing these issues requires:

Performance Testing

- Monitoring and Profiling
- Code Optimization
- Database Optimization
- Caching Mechanisms
- Load Balancing
- Scalability Planning
- Continuous Improvement

➢ *CONCLUSION:*

The student report card management system project has successfully delivered a robust and user-friendly platform for managing academic records. While achieving its objectives, there's room for ongoing improvement in performance, efficiency, and user experience. Overall, the project represents a significant step towards modernizing academic administration and facilitating a more efficient learning environment.

➢ *FUTURE SCOPE :*

1. **Integration with Learning Management Systems (LMS)**:* Explore integration with existing Learning Management Systems to streamline data exchange and provide a seamless experience for students and instructors.

2. **Mobile Application Development:

Develop a mobile application version of the system to enhance accessibility and allow users to access key features on the go.

4. ***Advanced Analytics and Insights:****

Implement advanced analytics capabilities to analyze student performance trends, identify areas for improvement, and provide personalized recommendations for students and instructors.

5. ***Enhanced Communication Features:****

6. Introduce features such as in-app messaging, notifications, and alerts to improve communication between students, parents, teachers, and administrators.

6. **Accessibility Improvements:*

Ensure compliance with accessibility standards and guidelines to make the system usable by all users, including those with disabilities.

10. ***Expansion to Other Educational Institutions:****

Extend the system's capabilities to cater to other educational institutions such as colleges, universities, and vocational schools, adapting features to suit their specific requirements.

By embracing these future opportunities, the student report card management system can evolve into a comprehensive platform that not only manages academic records but also enhances the overall learning experience and contributes to student success and institutional effectiveness.

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- ***www.tutorialspoint.com***
- ***WWW.Stackoverflow.com***

YOUTUBE :

- ***Code with harry***
- ***Edureka***
- ***cs dojo***

CERTIFICATE FROM PROJECT GUIDE:

This is is to certify that this project entitled student report card management system"submitted in partial fulfillment of the degree of BCA, Kazi Nazrul University, done by Mr. ***Suranjan Sanyal***, Roll No. ***1032105125010019*** is an is an authentic work carried out by him at ***Bidhan chandra college*** under my guidance. The matter embodied in this project work has not been submitted earlier for award of any degree or diploma to the best of my knowledge and belief and project report is developed according to the"BCA PROJECT & PROJECT REPORT STANDARD 2023, KAZI NAZRUL UNIVERSITY".

Signature of the student ***Signature of the Guide***

CERTIFICATE FROM PROJECT GUIDE:

This is to certify that this project entitled student report card management system"submitted in partial fulfillment of the degree of BCA, Kazi Nazrul University, done by Mrs. ***pratima patwa*** Roll No. ***1032105125010013*** is an is an authentic work carried out by her at ***Bidhan chandra college*** under my guidance. The matter embodied in this project work has not been submitted earlier for award of any degree or diploma to the best of my knowledge and belief and project report is developed according to the"BCA PROJECT & PROJECT REPORT STANDARD 2023, KAZI NAZRUL UNIVERSITY".

Signature of the student ***Signature of the Guide***

CERTIFICATE:

The foregoing project report entitled "**Student report card management system**" is hereby approved as a creditable project and has been presented in a satisfactory manner to warrant its acceptance as prerequisite to the degree for which it was submitted.

It is understood that by this approval, the undersigned do not necessarily endorse any conclusion drawn or opinion expressed therein, but approve the project for the purpose for which it is submitted.

Head of the Institution

SELF CERTIFICATE:

This is to certify that the dissertation/project report entitled "***Student report card management system***" is done by me is an authentic work carried out for the partial fulfilment of the requirements for the award of the degree of BCA under the guidance of MR. ***Rajdip Chatterjee***. I also certify that that I am aware of the "BCA PROJECT & PROJECT REPORT STANDARD 2024, KAZI NAZRUL UNIVERSITY" issued by Kazi Nazrul University and this project report is based on that standard. The matter embodied in this project work has not been submitted earlier for award of any degree or diploma to the best of my knowledge and belief.

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This is to certify that the dissertation/project report entitled "***Student report card management system***" is done by me is an authentic work carried out for the partial fulfilment of the requirements for the award of the degree of BCA under the guidance of MR. ***Rajdip Chatterjee***. I also certify that that I am aware of the "BCA PROJECT & PROJECT REPORT STANDARD 2024, KAZI NAZRUL UNIVERSITY" issued by Kazi Nazrul University and this project report is based on that standard. The matter embodied in this project work has not been submitted earlier for award of any degree or diploma to the best of my knowledge and belief.

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➢ ***ACKNOWLEDGEMENT :***

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We would like to express our gratitude towards our parents for their cooperation and encouragement which help us in the completion of the project.

- ***ENDORSEMENT CERTIFICATE FROM THE INTERNAL PROJECT GUIDE***:

I, The ***Rajdip Chatterjee, Bidhan Chandra College***, being the internal guide of the project ***"Student report card management system***", have understood the project problem and endorsing this project for final approval from the University, as the problem seems (on the prima-facie) to be good enough for the partial fulfilment of the BCA final year project (Course Code: BCAC605). I shall monitor the project development constantly and shall guide the students to develop the project as well as the project report according the BCA project & Project Report Standard 2023 with best of my efforts. Following is the list of the Students engaged in the current project.

Name and Registration No of the students:

1)

Suranjan Sanyal

Reg No: 103211250004

2)

Pratima Patwa

Reg No: 103211250006

Signature of the Guide

- ***DECLARATION:***

We do hereby declare that we are aware of ***BCA PROJECT & PROJECT REPORT STANDARD 2023, KAZI NAZRUL UNIVERSITY*** and we shall develop the project and prepare the project report according to the guideline with best of our efforts.

Name & Registration No. of the students **Signature of the Students**

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   Reg No : 103211250004

2) Name: pratima Patwa

   Reg No: 103211250006

KAZI NAZRUL UNIVERSITY

A Project submitted in partial fulfilment of

The requirement for the Degree of

Bachelor of Computer Applications

STUDENT REPORT CARD MANAGEMENT SYSTEM

Course code:- BCAC605

Year of Examination:- 2023-24

Submitted by

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Of

BIDHAN CHANDRA COLLEGE (ASANSOL)

INDEX:

ECONOMICS

BIDHAN CHANDRA COLLEGE
ASANSOL

TOPIC : IMPACT OF COVID 19 ON INDIAN ECONOMY

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SESSION	:	2021 : 2024
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UNIVERSITY REGISTRATION NO	:	103211220143
COURSE NAME	:	PROJECT OF SOCIO ECONOMIC ASPECTS
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BIDHAN CHANDRA COLLEGE

SUBJECT :- ENVIRONMENTAL STUDIES

PROJECT TOPIC :- ENVIRONMENTAL POLLUTION AND MANAGEMENT

NAME :- ANISHA GHOSH

REGISTRATION NO. :- 10323122053

DEPARTMENT NAME :- GEOGRAPHY

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It is my privilege to express my gratitude to my department

A special vote of thanks goes to all my friends, for their effective cooperation invaluable help and mental support.

Above all I am very much thankful to my parents for the support and affection.

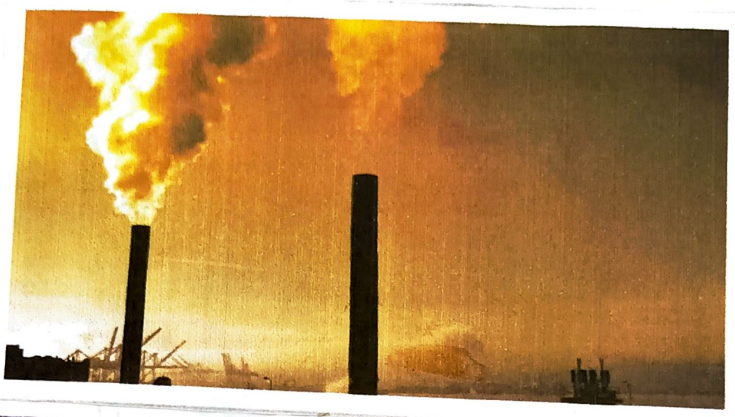
ENVIRONMENTAL POLLUTION AND MANAGEMENT

Pollution:- Environmental pollution refers to the unfavorable alteration of our Sourroundings, caused by human activities, that results in changes in energy patterns, radiation levels, and the chemical and physical constitution of organisms. It is a gobal problem with severe organisms, long term consequences, leading to the loss of vegetion, biodiversity, and the presence of hermful chemicals in the atmosphere and food. Pollution can take various very hemful forms, such as air, water, sail, noise, radioactive, and thermal pollution, but air pollution is the most significant threat to the environment and all living organisms. Environmental popullation is one the greatest challenges that the world is facing today. It began since industrial revolution, increasing day by day and causis effects and salutions. Looking into these will help you identify the causes and what steps you can take to mitigate these effects. Broadly, environmental popllution consists of sex basic types of pallution. Environmental pollution is causing a lot of distress not only to humans but also animals, driving many animal species to endangerment and even extinction.

Types of Environmental Pallution:- These are some majon categories of environmental pallution- (1) Air, (2) Water, (3) Sail, (4) Noise.

AIR POLLUTION

Introduction: Air pollution is contamination of the indoor or outdoor environment by any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere. House hold combustion devices, motor vehicales industrial facilities and forest fires are common sources of air pollution. Pollutants of major public health concern include particulate matter, carbon monoxide, ozone, nitrogen dioxide and sulfur dioxide. Outdoor and indoor air pollution cause respiratory and other diseases and are important sources and morbidity and mortality. WHO Data show that almost all of the global population breathe air that exceeds WHO guideline limits, and contains high levels of pollutants, with low and middle-income countries suffering from the highest exposures. Air quality is closely linked to the earth's climate and ecosystems globally. Many of the drivers of air pollution are also sources of greenhouse gas emmissions. Polices to reduce air pollution, therfore, offer a win win strategy for both climate and health, lowering the burden of disease attributable to air pollution, as well as contributing to the near and long-term mitigation of climate change. The combustion of fossil (coal, oil, and natural gas) is the principle source of air pollution in all urban areas, along with the burning of biomass such as firewood, agricultural wastes and animal wastes in rual airears and some cities. Most of the combusition of fossil fuels take place in industries, homes, for transportation of the generation of electricty. However, in the nast-ear-



Air pollution Through toxic gases
emitted from industrial plants

jority of Asian cities, transportation is the largest source of air pollution.

Cause:- The main causes of air pollution are—

(a) Burning of fossil fuels:- Fossil fuel emits hearmful gases such as sulfur dioxide and carbon monoxide into the air. One of the biggest causes of air pollution is sulfur dioxide, which is emitted through the combustion of fossil fuels such as coal, petroleum for energy in power points, plants and others industry combustibles.

(2) Automobiles:- The emmission of hearmful gases is caused by the excessive uses of otomobiles.

(3) Agricultural Activities:- various processes take place during agricultural activities such as the emission of ammonia, overuse of insecticides, pestidies, and fertilizeris. Ammonia is a typical byproduct of agriculture and one of the most dangerous gases in the atmosphere. Insecticides, pestidies, and fertilizers have all become increasingly common in agricultural paratices. They release hazardous chemicals and can pollute waters, farmers also set fire to the fields and old crops to clear them up for the new cycle of sowing. According to reports, burning to clean up fields pallutes the air by emitting toxic pollutants.

(4) Factories and Industries:- Emission of hearmful gases and chemicals into the air by the increasing industrical activities. Manufacturing companies emit a significant amount of carbon monoxide, hydrocarbons, organic compunds and chemicals into the air, lowering air quality. Manufacturing industries may be found in every corner of the globe, and no region has escaped their influence. petroleum refineries also emit hydro

Air pollution through toxic gases emitted by vehicles

carbons and a variety of other pollutants which damage the air and soil.

(5) Mining Activities:- Increasing emission of harmful substances through mining activities. Mining is the extraction of minerals from under the earth's surface utilizing heavy machinery. Dust and chemicals are released into the air throughout the process, resulting in significant air pollution. This is one of the factors contributing to the deteriorating health of workers and inhabitants in the area.

(6) Domestic Resources:- Effects of domestic sources such as the use of chemical paints and overuse of air conditioners. Household cleaning products and painting supplies products and painting hazardous chemicals into the air, polluting the environment. Another source of Air population.

(7) Vehicle pollution:- Vehicle pollution is undeniably the most significant source of air pollution, particularly source of air pollution in urban areas. When an automobile consumes gasoline, catamoinants are released into the air that are as dangerous as smoking ten cigarettes per day. carbon monoxide, hydrocarbons, nitrogen oxide, and particulate matter are all released by your vehicles. When car pollution levels are high in the atmosphere, it causes a hole in the ozone layer, resulting in smog and a variety of health problems.

Effects:- The consequences of air pollution are dire, like-

(1) Heart and Respiratory Issues:- The consequences of air pollution are serious. They have been linked to a variety of respiratory and cardiovascular diseases, including asthma, chronic bronchitis, emphysema, heart attacks, strokes, as well

as cancer. Several million people are thought to have died as a result of air pollution, either directly or indirectly.

(2) Global Warming:- Another direct result of global warming is the current changes that the planet is experiencing. Increased global warming, tempatures, rising sea levels due to melting ice form colder places and icebarges, relocation, and habbitats loss have already foreshadowed an oncoming crisis if preservation and normalisation measures are not done quickly.

(3) Impact on wildlife:- Animals, like humans, are subjected to the harmful effects of air pollution. Toxic substances in the air can compel wildlife species to relocated and modify their environment. Toxic contaminants settle on the water's surface, posing a threat to sea life.

(4) Ozone layer Depletion:- Ozone is found in the stratosphere of the earth and protects humans from hearmful ultraviolet (UV) rays. The presence of chorofluorocarbons in the atmosphere is degrading the ozone layer on earth. As the ozone layer this, damaging rays are emitted back to Earth, potentically causing skin and eye problems. UV rays have the power to harm crops as well.

(5) Problem's with children's health:- Even before you take your first breath, air pollution is harmful to your heath. premature disorder, autism, asthma, and spectrom disorder in early childhood are all caused by exposure to high amounts of air pollution during pregenay. It also has the potential to harm a child's early brain development and cause pneumonia, which kills almost a million children under the

age of five. In regions where air pollution are present. children are more likely to develop short-term respiratory infections and pulmonary illness.

(6) Smog:- Smog is the deadly combination of Smog and Fog. It is the greyish fog that is caused when the pollutants in the air, such as carbon particles, condense, and mix with the fog. Somag is extremely hearmful to humans and the entire environment. It can lead to diseases such as cold, flu, irritation of the eye. asthma and in the long term even low lung caneer.

(7) Acid Rain:- Acid rain is caused when a chemical reaction occurs between air pollutants and water and oxygen very high in the atmosphere. Pollutants such as sulphur dioxide and nitrogen oxide are water soluble and mix with the water in the atmosphere and precipitate of this acid rain. The acidic nature of this rain causes severe damage to the plants, animals and the soil.

(8) Climate change:- Many of the response strategies of addressing global climate change are also effective for reducing the traditional air pollutants such as particulates and sulphur dioxide. The adoption of strategies, primarily involving improvements in the effeiency of energy use, and greater use of energy sources other than coal, atomatically result in indoned the lowering the emissions of carbon dioxide the largest contributor to climate change.

Control Measures :- It is not easy to control air pollution, but it will require Some simple steps like—

(1) Avoid Using vehicles:- Prefer Using public transport as it will reduce the emission of CO into air. the availability of car pools can help in the reduction of vehicles which in turn reduces pollution. Prefer walking or cycling to nearby places and many Such.

(2) energy Conservation:- Use energy-efficient electrical devices at the workshop and home place. you can keep your light s switched off when not in use. The eletrical appeiances should be checked on a regular notice period so that it won't affect the conservation.

(3) Use of renewable Resources:- It will help to reduce the pollution level. Istead of using fossil fuels, we can use natural resources to produce energy like Solar energy, wind energy etc. By decreasing and eliminating the usage of fire and fire related items. Because industrial emissions are one of the leading causes of air pollution, the pollutants can be reduced by controling or treating them at the sources. If a given raw material's reations produce a pollutant, for example, the raw materials can be replaced with less harmful materials.

(4) Recycling and Reuse of products:- Some of the products which are thrown away after use can be recycled and reused for a to cleaner environment. It takes less energy to recycle than manufacturing the same products and thereby reducing the Chemical emissions.

(5) Avoid Burning of plastics:- Burning of plastics and other Similar materials release poisonous gases in the atmosphere which

worsens the condition of the air. Make use of the waste management plans by the goverment to dispose of plastic materials.

(6) Avoid air conditionars and use fans:- The heat relased by the air conditioner into the atmosphere form greater than the heat it absorbs form the room. This greater heat relased into the air because global warming. The freon goes which is used as a refrigerant causes the depletion of ozone layers which prevents the harmful ultraviolet rays form reaching the hearth.

(7) Use filters in chimneys:- The smoke released from chimneys contains air pollutants that worsen the quality of air. Hence, using filters in chimneys can prevent air pollutants form reaching the earth's atmosphere to a greater extent.

(8) Avoid crackers and fireworks:- The burning of earthers and and fireworks causes air pollution. During festivals, the use of large amounts of fireworks and crakers worsen the quality of air and can cause poor visibility.

(9) planting more trees:- The plants can purify the air by taking in carbon dioxide and releasing oxgen during the time of photosynthesis. This reduces the greenhouse effect and thereby decrases air pollution again. Planting more tress also helps to avoid global warming.

(10) Uses of green fuel:- Green fuel refers to biogradable fuel derived from natural gas that can be used to replace petroleum and deesel.

(11) Installation of Scrubbers:- Installing Scrubbers in the engines of cars will squester the oxides of sulfur and nitrogen. Thus they will not be relased into the environment

WATER POLLUTION

Introduction:- water pollution occurs when harmful substance— often chemicals or microorganisms — contaminate a stream, river, lake, ocean, aquifer or other body of water, degrading aquifer water quality and rendering it toxic to humans or the environment. The widespread problem of water pollution is jeopardizing our health. Unsafe water kills more people each year than war and all over other forms of violence combined. Meanwhile, our drinkable water sources are finite! Less than 1 percent of the earth's freashwater is actually accessible to us. without action, the challenges will only increase by 2050, when global demand for freashwater is expected to be one-third greater than it is now. when water polluted, it adversely affects all lifeforms that directly or indirectly depend on this sources. The effects of water contamination can be felt for years to come. water pollution is the contamination of water bodies usually caused due to human activities. Water pollution is any change in the physical, chemical or biological properties of water that will have a detrimental consequence of any living organism.

causes of water pollution:- water is one of the most important elements on earth when it comes to sustaining life. Unfortunately, it is also extremely susceptible to pollution. This is largely because water is a universal solvent that can dissolve many substances. There are causes of water pollution. Below, we will focus on seven of the major ways the water

the water can become polluted.

(1) Industrial waste:- Industries and industrial sites across the world are major contributors to water pollution. Many industrial sites produce waste in the form of toxic chemicals and pollutants, and though regulated, some still don't have proper waste management systems in place. In these rare cases, industrial waste is dumped into nearby freshwater systems. When industrial waste is not treated properly, it can very easily pollute the freshwater systems that it comes into contact with. Industrial waste from agricultural sites, mines and manufacturing plants can make its way into rivers, streams and other bodies of water that lead directly to the sea. The toxic chemicals in the waste produced by these industries not only have the potential to make water unsafe for human consumption, they can also cause the temperature them in freashwater systems to change, making them dangerous for many water dwelling organisms.

(2) Marine Dumping:- The process of marine dumping is exactly what it sounds like, dumping garbage into the waters of the ocean. It might seem crazy, but household garbage is still collected and dumped into oceans by may countries across the world. Most these items can take anywhere from two to 200 years to decompose completely.

(3) Sewage and wastewater:- Harmful chemals, bacteria and pathogens can be found in sewage and wastewater even when it's been treated. Sewage and waste water form each household is relased into the sea with fresh water. The pathogens and bacteria found in that wastewater breed di-

Garbage dumped in ponds causes water pollution

(4) Oil Leaks and spills:- The age-old phrase "like water and oil" is used when describing two things that do not mix easily or at all. Just as the saying states, water and oil do not mix, and oil does not dissolve in water. Large oil spills and oil spills and oil leaks, while often accidental are a major cause of water pollution. Leaks and spills often are caused by oil drilling operations in the ocean or ships that transport oil. Wildlife.

(5) Agriculture:- In order to protect their crops from bacteria and insects, farmers often use chemicals and pesticides. When these substances seep into the groundwater, they can harm animals, plants and humans. Additionally, when it rains, the chemicals mix with rainwater, which filter into the Ocean causing further water pollution.

(6) Global warming:- Rising temperature due to global warming are a major concern in terms of water pollution. Global warming causes water temperatures to rise, which can kill water dwelling animals. When large die-offs occur, it further pollutes the water supply, exacerbating the issue.

(7) Radioactive waste:- Radioactive waste form facilities that create nuclear energy can be extremely hazardous to the environment and just be disposed of properly. This is because uranium, the element used in the creation of nuclear energy, is a highly toxic chemical. Unfortunately accidents still occur at these facilities, and toxic waste is released into the environment. The coal and gas indus-

tries are, in many ways, no better. This is one of the major impetuses behind the development of alternative, clean sources of energy, including solar and wind.

Effects of water pollution:- Deteriorating water quality is damaging the environment, health conditions and the global economy. There are some of the other consequences:—

(1) Destruction of biodiversity:- water pollution depletes aquatic ecosystems and triggers unbridled proliferation of phytoplankton in lakes.

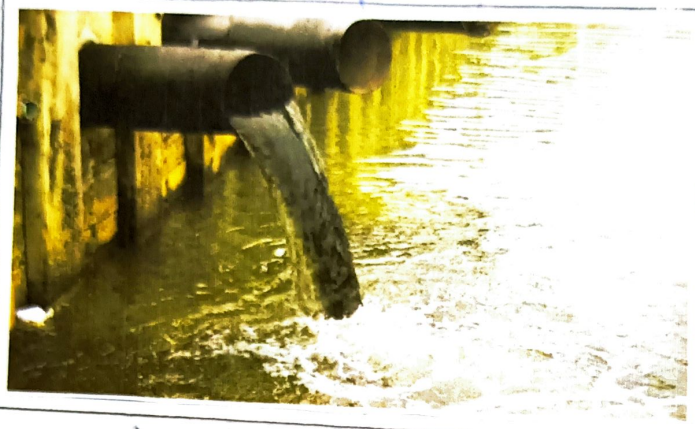
(2) Contamination of the food chain:- Fishing in polluted waters and the use of waste water for livestock farming and agriculture can introduce toxins into foods and which are harmful to our health when eaten.

(3) Lack of potable water:- The UN says that billions of people around the world have no access to clean water to drink or sanitation particularly in rural areas.

(4) Disease:- The WHO estimates that about 2 billion people have no option but to drink water contaminated by excrement, exposing them to diseases such as cholera hepatitis and dysentery.

(5) Infant mortality:- According to the UN, diarrhoeal disease linked to lack of hygiene cause of the death of about 1,000 children a day worldwide.

(6) Use environmentally friendly products:- By using soluble products that do not go on to become pollutants, we can reduce the amount of water pollution caused by a household.



polluted water discharged from industrial factories mixed in ponds

(7) Better treatment of Sawage:- So treating waste products before disposing of it in a waterbody helps reduce water pollution on a large scale. Agriculture or their industries can recuse this wastewater by reducing its toxic contents.

(8) Eutrophication:- Agricultural products such as fertilizer of ammonia and phosphate, which can boost crop yields. However, these nutrients can find their way into streams, lake and other water channels through run-off, thus unbalancing the decilcate aquatic ecosystems. This sparks process called eutrophication., whereby certain organisms can proliferate and consume more than their fair share of oxygen and sunlight depriving others of these important resources in the process.

(9) Economic impacts:- the effects of water pollution are not just related to human and environmental health, either. contaminated water supplies must go through a rigorious treatment process before they can become portable or suitable of igation, washing or swimming on. This entails a financial price tag that is prohibitive on human progress. Meanwhile, anmather economic impact engendered by water pollution is the loss of revenue experienced by the tourism industry in certain parts of the world.

(10) Effects on Human Beings:- life is a cycle, and humarity's irresponsible behaviour often comes back to haunt it. Adding contaminants to water bodies has affected the human family in several ways.

Control measures of water pollution:- water contamination can be controlled in many ways and methods by taking proper actions and introducing new technologies.

(1) **water Treatments methods:-** we must avoid dumping waste into water bodies. water treatment plants should be used for sewage water and effluent removal plants for effluent removal. Industrial waste wastes should be properly treated before relasing into water bodies.

(2) **Minimize the use of chemical fertilizers and pesticides:-** chemical fertilizers and pesticides must be banned and instead organic or ecofriendly fertilizers should be used. The better option is to switch to organic farming methods and use animals - based manure. These will keep the harmful chemicals away from water bodies.

(3) **Utilization of less water:-** we must save water as much as possible as only about 1% of the earth's total water is available for the use of most aquatic and terrestrial organisms. It can be easily achieved by installing water-saving equipment like sinks, toilets, and showers. In our daily lives, we can help save water by taking short baths and not keeping the tap running during brushing etc.

(4) **Avoid polluting open - Air water sources:-** Littering of water bodies and their surroundings, oil spills, chemical disposal, dumping of fertilizers, pesticides, etc. should be avoided. So, it is required to stop littering wastes near the water sources or around them to avoid seeping the wastes into the water sources.

(5) chemical methods:- chemical process such as precipitation reverse osmosis and coagulation and ion exchange method will help to reduce the level of water pollution. Use chlorine for disinfection, add lime to adjust pH, and use bleaching powder and alum for arsenic removal.

(6) Public Education and community involvement:- Educating the public about the sources and effects of water pollution and promoting community involvement in water conservation efforts can lead to significant improvements in local water quality. Initiatives like community cleanup days and educational campaigns raise awareness and encourage proactive protection of water recources, crucial for public education on water pollution and fostering community water conservation.

(7) Enhancing water legislation and policies:- Robust legal frameworks and consistent eforcement of water pollution laws are essential for sustainable water management. Crovernments can enhance water pollution laws are essential by seeting stringeant water quality standards and ensuring compliance through regular monitoring and penalties for violations. This firm legal foundation supports the enforcement of water quality standards.

(8) Industrial wastewater Treatment:- Industries are major contributors to water pollution. Implementing advanced industrial wastewater treatment solutions such as reverse osmosis, ultrafiltration, and biological treatment can significantly reduce pollutions in wastewater before discharge into natural water bodies.

SOIL POLLUTION

Introduction:- Soil pollution is defined as the presence of toxic chemicals in the soils, in very high concentrations to pose a risk to human health and the ecosystem. Or in simple words alteration in the natural soil due to human activites is termed soil pollution. All the soils contain compounds that are harmful to human beings the other living organisms. However, the concentration of such substances in unpolluted soil is so low that they do not pose any threat to the surroundings but when the concentration of such toxic substances becomes high enough to cause damage to living organisms, the soil is said to be contaminated. Soil contamination can occur because of human activites or because of natural processes. However, mostly it is due to many human activities. Generally polluted water also pollute soil. Soil waste is a mixture of plastics, cloth, glass, metal and organic matter, sewage, sewage slude, building debris, generated from households, commerical, and industries establishments add to soil pollution. Fly ash, iron and steel slag, medical and industrial wastes disposed on land are important sources of soil pollution. In addition, fertilizers and pesticides from agricultural use which reach soil as run off and land filling by municiple waste are growing cause of soil pollution. Acid rain and dry deposition of pollutants on land surface also contribute to soil pollution.

Causes of soil pollution:- There are some main cause of soil erosion, like—

(1) Industrial pollution:- The discharge of industrial waste into soils can result in soil erosion or soil pollution. In india, as mining and manufacturing activities are increasing proper rapidly, soil degreadation is also increaseing. The extration of minerals from the earth is responsible for affecting soil fertility. Whether is it iron ore or coal, the by products are contaminated, and they are disposed of an a manner that is not considered safe. As a result, the industrial waste stays on the soil surface for a long duration and makes it unsuitable for further use.

(2) Agricultural Activities:- The use of insecticides and pesticides for a long period can cause soil pollution. Pepetitive use can cause insects and poests to become resitant to it. Instead of killing pestes and sinsects, it degrades the soil quality. They are full of chemicals that are not Produced in nature and cannot be broken down by them. As a result, they seep into the ground after they mix with water and slowly reduce the fertility of the soil. Plants absorb many of these presticides, and after decomposition cause soil pollution.

(3) waste disposal:- Disposal of plastics and other soil waste is a serious issue that causes soil pollution, disposal of electrical items such as batteries because and adverse effect on the soil due to the presence of harmful chemicals. Human waste such as fiscene, Urine, faeces, diapers etc is dumped directly in the land. It causse both soil and water pollution.

(4) Acid rain:- It is caused when pollutants present in the air mix with the rain and fall back on the ground. The polluted

Soil pollution through disposal of waste

water could dissolve away some of the essential nutrients found in soil and change the structure of the soil thus thinning and making it unsuitable for agriculture.

(5) Oil spills:- Oil leakes can happen during the storage or transport of chemicals, the chemicals present in the fuel deteriorates the quality of soil and make them unsuitable for further cultivation, chemicals can also enter into the ground water through the soil, and hence it will make water undrinkable.

(6) Radioactive pollutants:- Radioactive substances resulting from explosions of nuclear testing laboratories, radioactive fallout and industries rise to nuclear from explosions of dust and radioactive wastes penetrate the soil and accumulate giving rise to nuclear dust and soil pollution. E.g. nuclear reactors produce waste containing ruthenium-106, Iodine-131, Barium-140, Cesium-144 and Lanthanum-140 along with primary nuclides Sr-90 with a half life 28 years and cs-137 with a half life 30 years. All the radio nuclides deposited on the soil emit gamma raditions.

Effects of Soil pollution:- Impacts of soil pollution are not confined to soil. Some of the effects are as follows—

(1) Human Health:- Since we are dependent on the land for our food, pollution from the soil is transfersed to us in this manner. Bio accumulation of toxins occur in our bodies, causig choronic paisoning and leading to various diseases. Reproductive health and birth and developmental defects, neurologic effects, malnutrition, and mutations in the cells of the

the body leading to cancers all these are on the increase today.

(2) Growth of plants:- The ecological balance of any system gets affected dere to the widespread contaimination of the soil. Most plants are unable to adapt when the chemistry of the soil changes so radically in a short period of time. Fungi and bacteria found in the soil that bind it together begin to decline, with crates an additional probelem of soil erosion.

(3) Decrased Soil Fertility:- The toxic chemicals present in the soil can decrase in the soil can soil fertility and therefore decrase in the soil yield. The contamined soil is then used to fruits and regetable which lacks quality nutrients and may contain some poisonous subtance to cause serious health problems in people consuming them.

(4) Effect on ecosystem and Biodiversity:- Soil pallution can held or lead to the lacs of biodiversity in the ecosystem. The life of bird, insect, mammal and repitle species that life live in the soil can get affected by pollution. The soil is an important habitat.

(5) Impact on Agricultural Productivity:- Agriculture heavily relies on healthy soil for crop growth and productivity. Soil pollution negatively affects agricultural lands, reducing crop yields and quality. When soil is polluted, plants may struggle to obtain essential nutrients and water, leading to stunted growth and poor productivity. contaminants in the soil can also affect the physiological processes of plants, making them more susceptible results in crop losses and reduced food production. Therefore, Soil pallution poses a significant threat to global

Soil pallution by plastic Bags

food security. especially in regions where agriculture is a primary source of livelihood such as india.

(6) contamination of underground water :- Soil contamination affects the underground water table, allowing toxins to seep into water sources. prolonged use of contaminated water from wells and tube wells can lead to health issues such as arsenic poisoning and food contamination.

(7) changes in Soil Structure:- The death of many soil organisms in the soil can cause changes in soil structure. Organic farming methods are being promoted, which abone the use of chemical laden pesticides and fertilisers. plants that can remove pollutants from the soil are being encouraged to be used. The road ahead, however, is quite long, and preventing soil pollution will take many years. Industries have been given regulations for the disposal of hazardous waste, with the goal of reducing the amount of polluted land.

Control Measures of Soil pollution:- soil pollution is a complex issue that must be addressed. It is important that we all understand the importance of soil to our survival. It is a complicated participation of from individuals to the government. A few methods for reduceing soil pollution, like—

(1) Reduced use of chemical fertilizers:- chemical fertilizers are more damageing than helpful. while the right quantity can help the soil become more fotile, too much might in potentially poison it. chemical fertilizers in excess could harm the soil in a variety of ways. It has the abilitity to

affect the soil's pH values.

(2) Reforestation:- Deforestation or the cuting down of trees are the main cause of erosion of the sail due to which leads the loss of fertility of the sail occurs which leads to soil pollution. Reforestation is an effective method of preventing is sail pollution. Another can be cut down of the usage of pap- or or use recycle paper. This will lead fewer tress to be cut down and therfore reduced deforestion.

(3) Proper waste menagement:- Effective disposal of indus- trial and residential waste is vital to reduce land conta- mination. proper disposal of hazardous waste is crucial to prevent sail pollution.

(4) Avoiding the use of Hamful chemicals:- we should reduce the number of fertilizers for our crops as excess fertilizers make the sail acidic and can polute sail and groundwater. So it is crucial to avaid using them useless absolutely ness- sary. If they must be used, they should be used according to the manufacturer's instructions.

(5) Reduced use of chemical fertilizers and recycle, reuse pro- ducts:- These steps not only reduce waste generation but also ensure that sail pollution is reduced. At present, plastic forms a significant portion of the generated wastes which are generally buried in landfills, waste materials de- compose slowly and release materials into the sail. These toxic substances are very harmful to the health of the soil and are a major source of sail pollution. Be using and recycleing thinks, it could be ensured that lesser wastes

are demped in these landfills and this, in turn would reduce soil pollution.

(6) composting:- Another way to reduce land pollution is through composting. According to the united states environmental protection Agency food scraps and yard waste together currently makeup more than 30% of what we throw away and could be composted instead. Minimizing and repurposing waste helps preserve the environment.

NOISE POLLUTION

Introduction :- The word 'noise' is deived from the lation word Na- ausea' which means sickness in which one feels the need to vo- mit. Noise is the unpleasent and undesirable sound which leads to discomfort in human beings. The intensity of sound is mea- sured in decibels (dB). The faintest sound that the human ear can hear is Db. Due to increasing noise around the civilizations noise pollution has become a matter of conern. Some of its major causes are vehicles, aircraft, industrial machines, lou- dspeakers, crackers etc. when used at high volume, some other appliances also contribute to noise pollution, like tele- vision, transistor, radio etc. Not all sound is considered noise pollution. The world health organization (WHO) defines noise above 65 decibles (dB) as noise pollution. To be precise, noise becomes harmful when it exceeds 75 decibels (dB) and is painful above 120 dB. The presence of noise pollution has a daily impact on millions of people. Hearing loss caused by noise is the most common health problem caused by noise exposure. Furthermore, loud noise can also lead to health pro blems such as hypertension, heart disease, sleep disturbances and stress. All age groups are susceptible to these health problems, especially children. It has been shown that chil- dren living near loud airports and busy streets suffer from stress and other problems, such as memory problems, att- ention difficulties and difficulities with reading. Animals are also adversely affected by noise pollution.

Causes of Noise pollution:- There are many causes of noise pollution. There are many causes of noise pollution like loud music, horns, talking on the phone for a longer time period generators, vacuum cleaners, pressure cookers, contruction work, airplanes and trains etc. There are following causes of Noise pollution :—

(1) Industrial causes:- Industries, mills and factories Produce high intensity sound and noise these Soundes are the major causes of industrial noise pollution. Industrial noise pollution can be caused by textile mills, engineering companies and printing drills, rotating belts and saws and are a nuisance to the public. Industries or manufactureing facilities new residential areas can cause itence sound levels that can cause or damage hearing ability. People who are working in industries wear earplugs mandatorily and earplugs provide a shield against the entry of loud noise.

(2) Agricultural machinery:- It includes the noise of thrashers, power saw, tractors, harvesters, power thrillers, and tube wells. when they are in operation they to produce high intensity noise. people use who use tractors, harvester, and machines wear noise-proof gadgets to avoid any type of desease. In india punjab has recorded noise levels in the range of 90dB to 98dB while performing agricultural machinery operations.

(3) Household utilities:— Household noise pollution commonly happens while doing household work. it includes the sound of presure cookers, washing machines, mixer grin-

Noise pallution from playing the mic too loud

ders, air conditioners, dryers, desert coolers, vaccum cleaners and Sewing machines, mixer grinders, air cooler etc. House hold noise pollution can also be caused by electrical devices like televisions, telephones, radios, transistors, loudspeakers, musical instruments, etc. Household behaviours or activities like the crying of babies, loud quarrels, house renovations and banging of doors can also cause household noise pollution.

(4) Transportation:- transportation Noise pollution can be caused by traffic, trains, and aircraft. Scooters, Motorcycles, trucks, buses, cars and its rapidly increasing number. As traffic is increasing and it can produce noise through repeated hooting. constant high sound is caused by airplanes, helicopeters, jets and metros. people who live in metropalitan areas or near airports can hear the constant sounds that can deafen the elderly.

(5) Social Events:- The includes concerts, parties, worship places, discos etc. Loud sounds from social events are mainly known as a 'nuisance' that can affect the sleeping cycle of the person.

(6) Environmental causes:- storms are one of the environmental causes that can pose noise popllution. storms can create high noise pollution and can be very derasting like cyclones, hurricanes, and tornadeos. Environmental causes also include lighting and theunderstorms that can create high-sound noises that may effect the ability of hearing.

(7) Defense Machinery:- It includes military tanks, shooting pratices, milltary airplane training, explosions and

rocket launching that affect the environment badly. A sonic booms and jet engine noises are highly pitched that impact badly on ears and can cause defening.

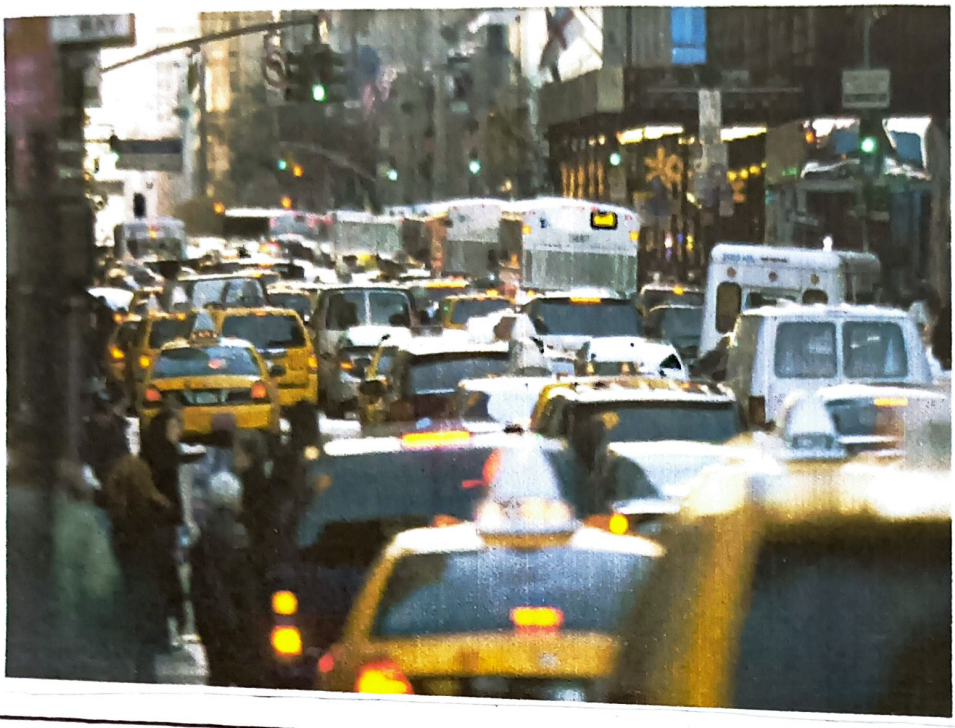
(8) Household or contraction activities:- The construction of buildings, stations, roads, dams, flyovers and mining produces high noise, the sound produced can even hinder the hearing capacities of an individual exposed to the sound.

cause and effects of noise pollution:- There are some dangerous effects of noise pollution. like—

(1) Hearing problems:- Any unwanted sound that our ears have not been built to filter can cause problems within the body. our ears can take in a certain range of sounds without getting damaged. Man made such as horn, machiery, airplanes and even vehicles greeting to loud for our range. Constant exposure to loud levels of noise can easily result in the damage of our ear drums and loss of hearing. It also reduced our sensitivity to sounds that our ears pick up unconsicously to regulate our body's rhythem.

(2) Health issues:- Excessive noise pollution in working you sleeping areas such as office, constructionsites, bars and even in our homes can influence pychalogical health. Studies disturbance of sleep, show that the con-occurrence of aggressive behaviour, constant stress, fatigue and hypertension can be linked to con-exeesive noise levels. These it turn can cause more severe and chronic health issues later in life.

(3) Sleeping Disconders:- Loud noise can certainly hamper your sleeping pattern and and may lead to irritation and un-



Noise pollution due to vehicular movement

comfortable situations. without a good night sleep, it may lead to problems related to fatigue and your performance may go down in office as well as at home. It is therefore recommended to taken sound sleep to give your body proper rest.

(4) Cardiovascular Issues:- Blood pressure levels, cardiovascular disease and stress related heart problems are on the rise. studies suggest that high intensity noise causes high blood pressure and increases heart beat rate as it disrupts the normal blood flow. Bringing them to a manage able level depends on our understanding noise pollution and how we tackle it.

(5) Trouble communicating:- High decibel noise can put trouble and may not allow two peple to communicate freely. This may lead to misunderstanding and you may get difficult understanding the other person. Constant sharp noise can give you severe headache and disturb your emotional balance.

(6) Effect on wild life:- wild life faces far more problems than humans because noise pollution since they are more dependent on sound. Animals develop a better sense of hearing than us since their survival depends on it. The ill effects of excessive noise begian at home. pets react more aggressively in households where there is constant noise. They become disoriented more easily and face many behavioral problems.

Control measures of Noise pollution:- (1) For people working in noisy installation, ear-protection aids like ear plugs, earmuffs, noise helmets, headphones etc. must be provided to reduce occupational exposure.

(2) Acoustic Zoning:- Increased distance between source and

and reciver by zoning noisy industrial areas, bus terminals and railway stations, aerodromes etc. away from the residential areas would go a longway in minimising noise pollution. There should be silence zones near the residential areas, educational institutions and above all, near hospitals.

(2) <u>personal Hearing protection Devices:-</u> personal Hearing protection Devices have been designed specifically to protect our ears from specific noise hazards. These devices come in many different forms and are used by workers all types of industries. when possible, employers should implement engineering controls for noise to reduce exposure to excessive noise levels. However, if such controls for cannot be implemented for safety reasons or economic reasons, employers must train employees about the proper use of personal hearing protection devices and require them to wear them when exposed to hazardous noise levels that can cause hearing loss.

(3) <u>Acoustical ceiling Tiles:-</u> Acoustical Ceiling Tiles used to control noise pollution in the workplace consist of acoustical céling ceiling tiels made with thick and high density with Acoustic foam. These acoustic ceiling tiles with holes can felter the noises coming from the outside, meet requirements of fire-resitant grade, and help to reduce echo sound effectively.

(4) <u>Maintenance of automobile:-</u> Regular servicing and tuning of vehicals will reduce the noise level. Fixing of silencers to automobiles, two wheelers etc. will reduced the noise levels.

(5) Maintenance of Machines:- proper lubrication and maintenance of machines, vehicles etc. will reduce noise levels. For example, it is a common experience that, many parts of a vehicals will become loose while on a rugged path of Journey. If these loose parts are not properly fitted, they will generate noise and cause annoyance to the driver. Similarly is the case of machines. proper handling and regular maintance is essitional not only for noise control but also to improve the life of machine.

(6) Selection of machinery:- optimum selection of machinery tools or equipment reduces excess noise levels. For example selection of chairs, or sletion of certain machinery which generate less noise due to its superior technology etc. is also an important factor in noise minimisation strategy.

(7) Prohibition of usage of loud speaker:- By not premitting the usage of loudspeakers in the habitat zones expect for important meetings. Now a days, the urban Administration of the metro cities in India, is becoming stringent on usage of loudspeakers.

(8) control over vibrations:- The vibrations of materials may be controlled using proper foundations, rubber padding etc. to reduce the noise levles caused by vibrations.

CONCLUSION

Environmental pollution is any discharge of materials or energy into water, land, or air that causes or chronic detriment to the Earth's ecological balance or that lowers the the quality of life. Pollutants may cause primary damage, with direct identifiable impact on the environment, or secondary damage in the form of minor perturbations in the delicate balance of the biological food web that are detectable only over long time periods. until relatively recently in humanity's history, where pollution has existed, it has been primarily a local problem. The industrialization of Society, the introduction of society, the introduction of motorized vehicles, and the explosion of the human population however, have caused an exponential growth in the production of goods and services. Many factors are present for why environmental pollution has become such a large issue in the world. There are many activities that can be done by both the common citizen to the governments of the world, which could severally improve the world's environmental problem. Environment is the surrounding of an organism. This Environment in which an organism lives is made up of various components like air, water, land, etc. These components are found in fixed proportions to create a Harmonious Balance in the environment for the organism in the environment for live in. So, the environmental problem that is worsening with each other needs to be harmful effects on humans as well

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(4) ww.wikipedia.com
(5) google images
(6) www.yahoo.cam.

Political Science

BIDHAN CHANDRA COLLEGE

KAZI NAZRUL UNIVERSITY

DEPARTMENT OF POLITICAL SCIENCE

SUPERVISOR : DR. AMRITA BANERJEE

CC14 : PROJECT (BAHPLSC602)

TOPIC : THE DARK SIDE OF LEADERSHIP

STUDENT DETAILS

Name: **ZEBA BAKHTIAR**

Semester: **VI (HONOURS)**

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University roll no.: **10321061210340 63**

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Page No.
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Zeba Bakhtiar
VI-th Semester

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Chapter-1
INTRODUCTION

This project is designed to introduce the readers to the darker side of leadership. The world is aware to the limelight and eminence of the concept of leadership. But not many can visualize the other side of the coin. So, let's begin a journey together and take a ride through this spectacular concept where you will be introduced to the cloudy side of captaincy.

The research has been divided into 5 chapters where initially the reader would be introduced to the shadowier side. The second chapter will open new doors and windows of the topic. The third chapter will supply the reader with investigation on the impacts of dark leadership. In the fourth chapter the reader will have a detailed inspection and scanning about a range of dark leaders that the history ever experienced and underwent. It would also give analysis of some dark leadership events. The task would be to aware the readers about the brutal, cruel and vicious

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PAPER CC-14

PROJECT

UNDER THE SUPERVISION OF

DR.AMRITA BANERJEE

TOPIC:

A CONTEMPORARY ANALYSIS OF THE RUSSIA - UKRAINE WAR

SUBMITTED BY:

NAWAZISH HUSSAIN

SEMESTER-VI

College Roll No. :10

Registration No. : 103211210010

University Roll No. :1032106121034032

Course Code. : BAHPLSC602

DEPARTMENT OF POLITICAL SCIENCE

BIDHAN CHANDRA COLLEGE

(Under Kazi Nazrul University)

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I would also like to acknowledge [Respected teacher, Family and Friends]

Nawazish Hussain

VI Semester

Table of content

01. Geopolitical/History context and Background

Kyivan Rus (9th-13th centuries): This early state is considered the foundation for both Ukrainian and Russian national identity.
Centuries of division: The territory was later divided and ruled by various empires, including the Russian Empire, Austria-Hungary, and Poland.

Soviet Era (1922-1991):

* Ukraine became a founding republic of the Soviet Union.
* The USSR saw industrialization and population shifts within Ukraine.
* Crimea, previously part of Russia, was transferred to Ukraine in 1954.

Post-Soviet Tensions (1991-present):

* Ukraine gained independence with the fall of the USSR.
* Despite cultural and linguistic links, Ukraine increasingly asserted its own national identity.
* Russia views Ukraine's potential integration with the West (NATO, EU) as a threat.
* The 2014 annexation of Crimea by Russia and the ongoing war in Eastern Ukraine are major flashpoints.

Geopolitical Significance:

* Ukraine's location makes it strategically important, bordering Russia and several European countries.
* It has fertile land and resources, and was once the Soviet Union's "breadbasket."

Understanding the Conflict:

* The current war stems from a clash of interests:
* Russia's desire to maintain influence over its former sphere of control.
* Ukraine's aspirations for self-determination and integration with the West.
* The complex history and cultural ties further complicate the situation.

Physics

ELECTRICAL INSTALLATION(WIRING)

Abhrapratim samanta
Reg. No.- 103221220089

- Some of the basic elements of electrical installations are:

✓ conductors provodnici
✓ insulators izolatori
✓ cables kablovi
✓ switches prekidači
✓ sockets priključnice
✓ light fittings sijalična grla
✓ lamps svjetiljke
✓ fuses osigurači
✓ distribution boards (box) razvodne table
✓ electrical panels (electric meters) elektricna brojila
✓ plugs utikači
✓ circuit brakers sklopke
✓ Residual Current Circuit Breaker automatski prekidac rezidualne struje

- **Electrical wiring** is an electrical installation of cabling and associated devices such as switches, distribution boards, sockets, and light fittings in a structure.

- Allowable wire and cable types and sizes are specified according to the circuit operating voltage and electric current capability, with further restrictions on the environmental conditions, such as ambient temperature range, moisture levels, and exposure to sunlight and chemicals.

- Materials for wiring interior electrical systems in buildings vary depending on:

➢Intended use and amount of power demand on the circuit

➢Type of occupancy and size of the building

➢National and local regulations

➢Environment in which the wiring must operate.

❖Homes typically have several kinds of home wiring, including electrical wiring for lighting and power distribution, permanently installed and portable appliances, telephone, heating or ventilation system control and computer networks.

❖AC power plugs and sockets connect electric equipment to the alternating current (AC) power supply in buildings and at other sites. Electrical plugs and sockets differ from one another in voltage and current rating, shape, size, and connector type

❖ Plugs, wallsockets need to be installed throughout the house in locations where power will be required

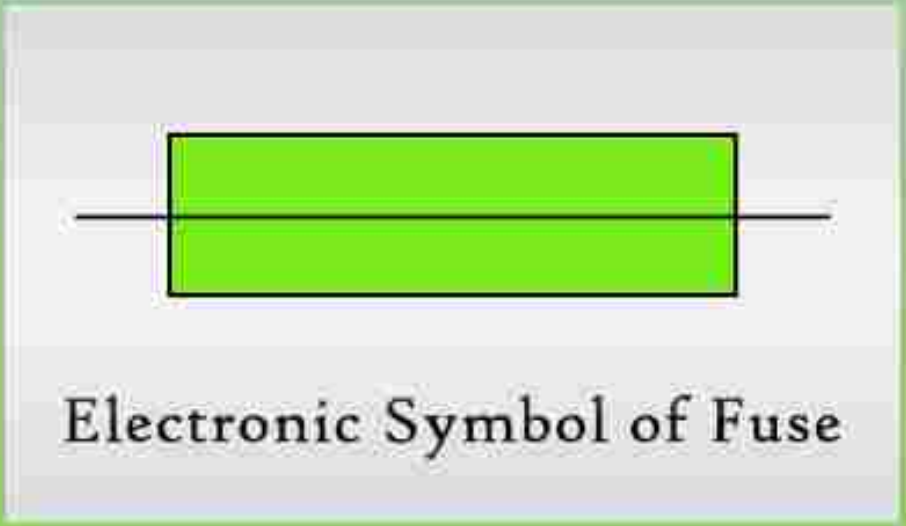
Electric meters

- First in the list of common electrical parts you see everyday is the Electric meter. It is used by the national electricity grid to measure the units of electrical energy used in your household circuits. Yeah, that's how they find the amount you need to pay for your electricity bill per month.

Electric Meters

Fuses

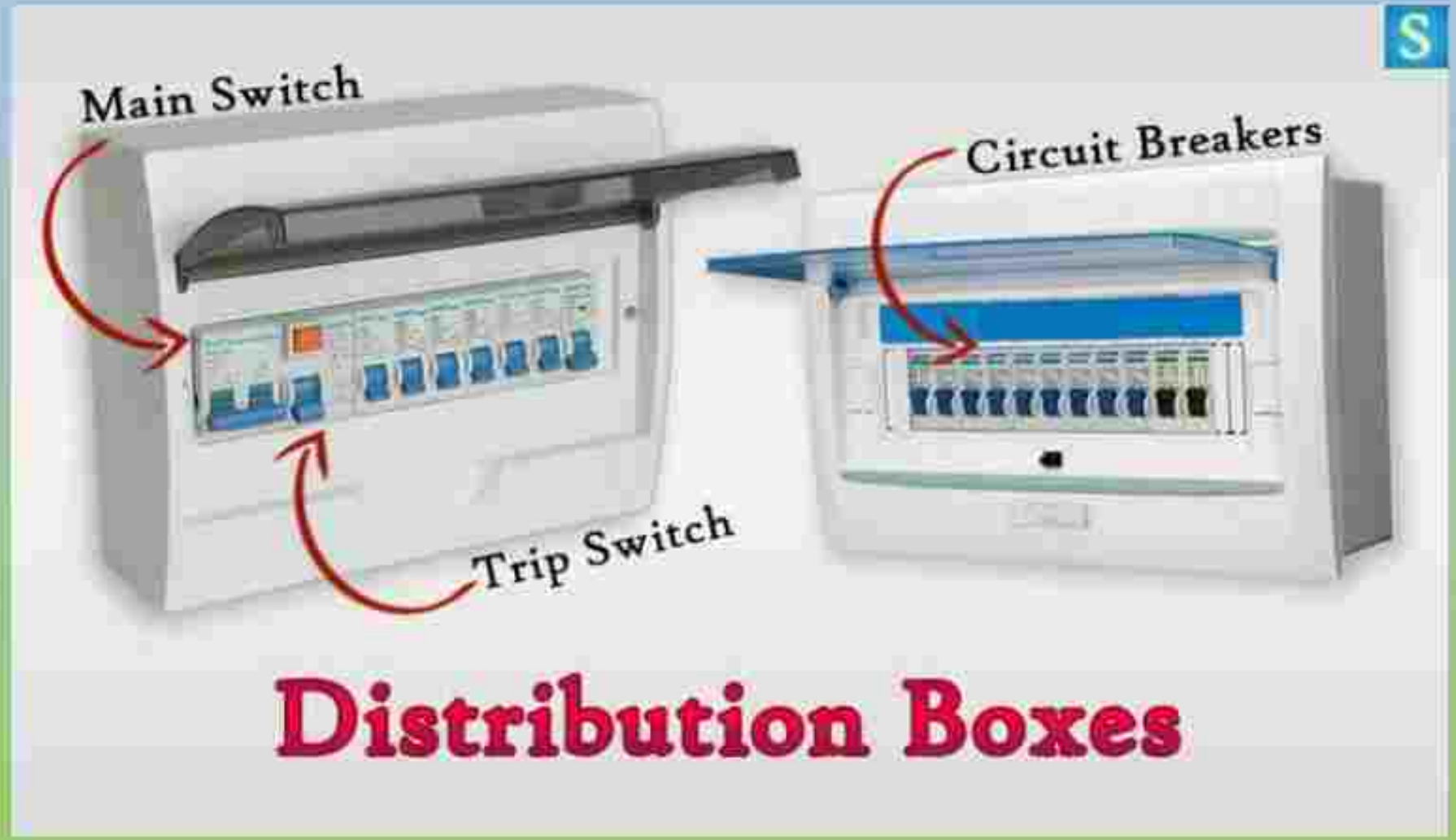
- A fuse is an electrical part which you can't see as it's always inside a plug or an electrical device such as TV.
- Basically fuses are used to protect electrical appliances, parts and electronic components from potential damage due to a high current – Ampere – flowing in the circuit.



- **A miniature circuit breaker** - it looks like a switch consisting various ampere values.
- Circuit breakers function similar to fuses. In the event of an exceeding current flow than the rated ampere value, the switch opens and stops the current, instead of melting anything or dying forever.
- The circuit can be connected again by closing the switch.

Distribution box

- Distribution box is another easy to notice electrical part in your home. It consists **3 more electrical parts**, namely,
  - ❖ Main Switch
  - ❖ Trip Switch
  - ❖ Circuit Breakers
- As the name implies, Distribution Box simply distributes the electric supply to sections of the house.
- These sections contain:
  - ➢ light circuits [Light Switches + Light Bulbs],
  - ➢ fan circuits [Fan Regulator + Fan]
  - ➢ plug socket circuits.



Distribution Boxes

Main Switch

- Every house or commercial building has a distribution box which is where the Main Switch is located.
- It's the first electrical part receiving the electricity from the electric meter inside your house. Therefore the Main Switch is the responsible part to take down the electricity throughout the house as required.
- Often useful while upgrading house wiring and when thundering & lightning to disconnect the supply.
- There are 2 wires inside the cable coming from the electric meter namely **Live Wire** and **Neutral Wire**. These 2 wires are then connected to the Main Switch. While the main switch is OFF the electric supply is stopped by disconnecting the two wires.

Main Switches

Main Switch (Single Phase)

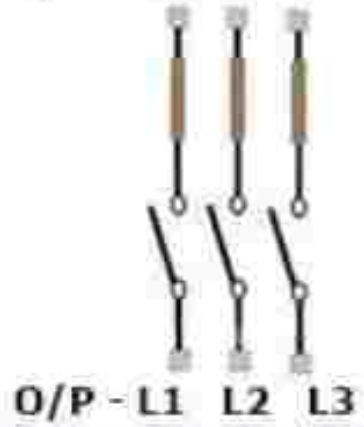
Mains I/P

Mains O/P

L-Live

N-Neutral

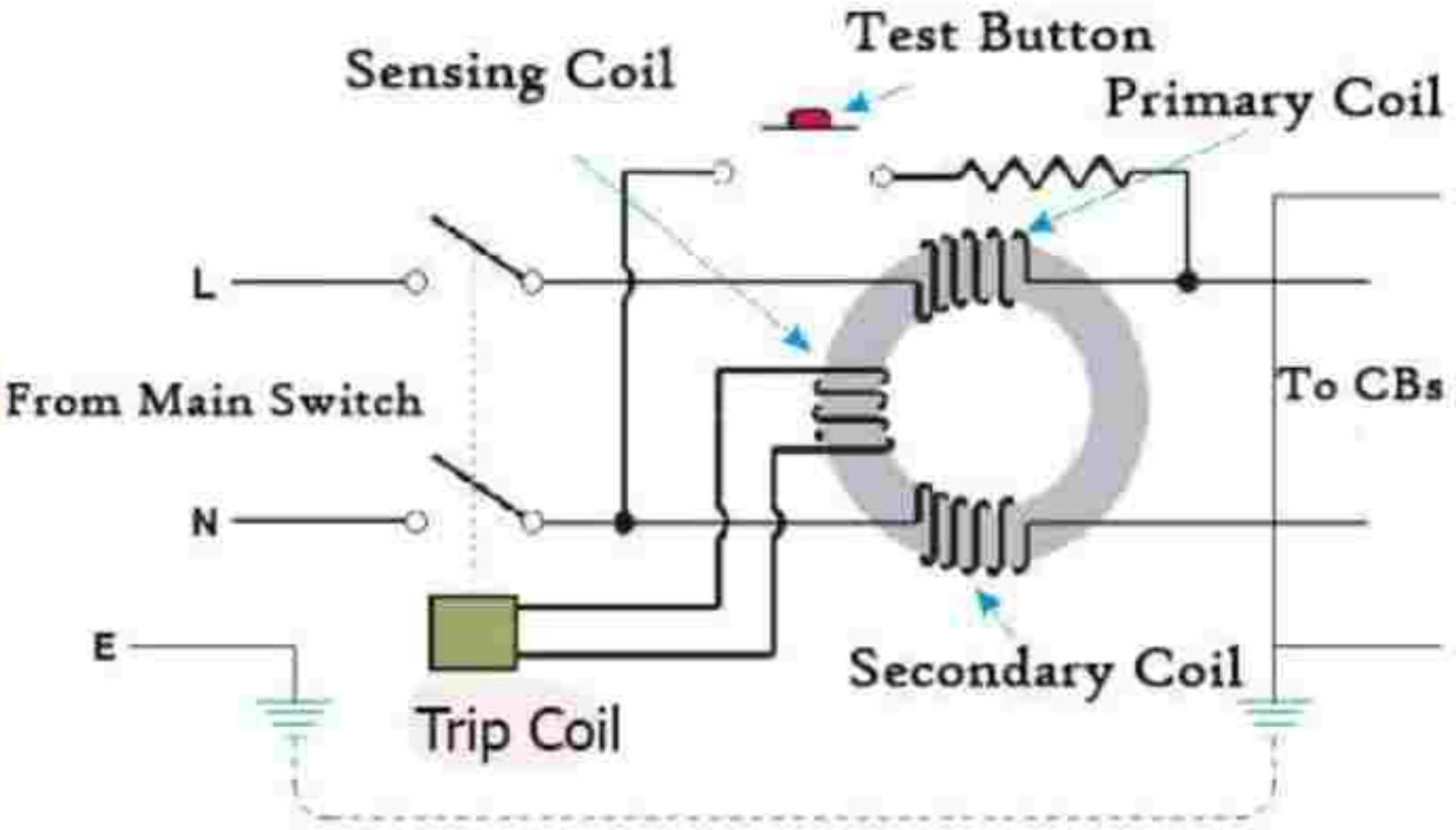
Mains Switch (Three Phase)



Trip Switch

- Electric current coming from the Main Switch connects to the Trip Switch via Live & Neutral Wires.

- If there is a fault in any of the circuits in the house this switch opens (Trip) automatically and disconnects the power supply.
- Residual Current Circuit Breakers work by comparing the current entering the appliance via the live wire with the current leaving the appliance through the neutral wire.
- RCCB consists of:
  - Primary coil
  - Secondary coil
  - Trip coil


Sensing Coil
Test Button
Primary Coil
L
From Main Switch
N
E
To CBs
Trip Coil
Secondary Coil

Wall Switches

- Switches are used in light circuits and plug socket circuits to connect or disconnect the circuit according to the will of the individual.

- There are different types of wall switches such as Push Button, Press Button... Then there are single, double, triple, quadruple as well as quintuple wall switches.

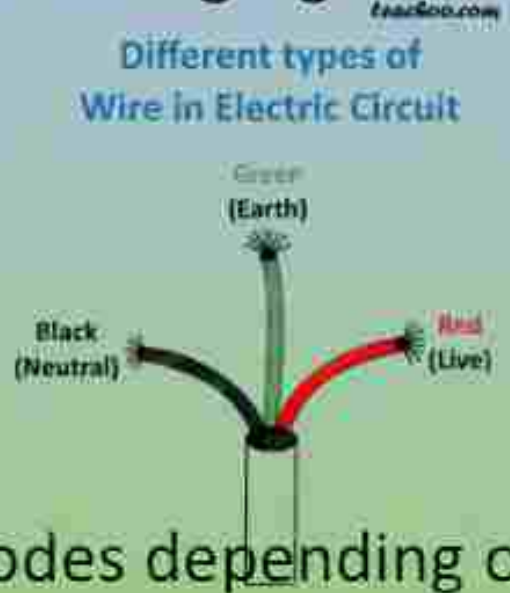
Couple of Wall Switches

Plug sockets

- Plug sockets are used to get electric supply for appliances like computers, electrical heaters, televisions, refrigerators and whatever electrical device you've been using.
- There are different types of Plug Sockets based on pin type such as two-pin plugs and three-pin plugs where the 3rd pin is for Earth Wire.

Electrical Wires & Cables

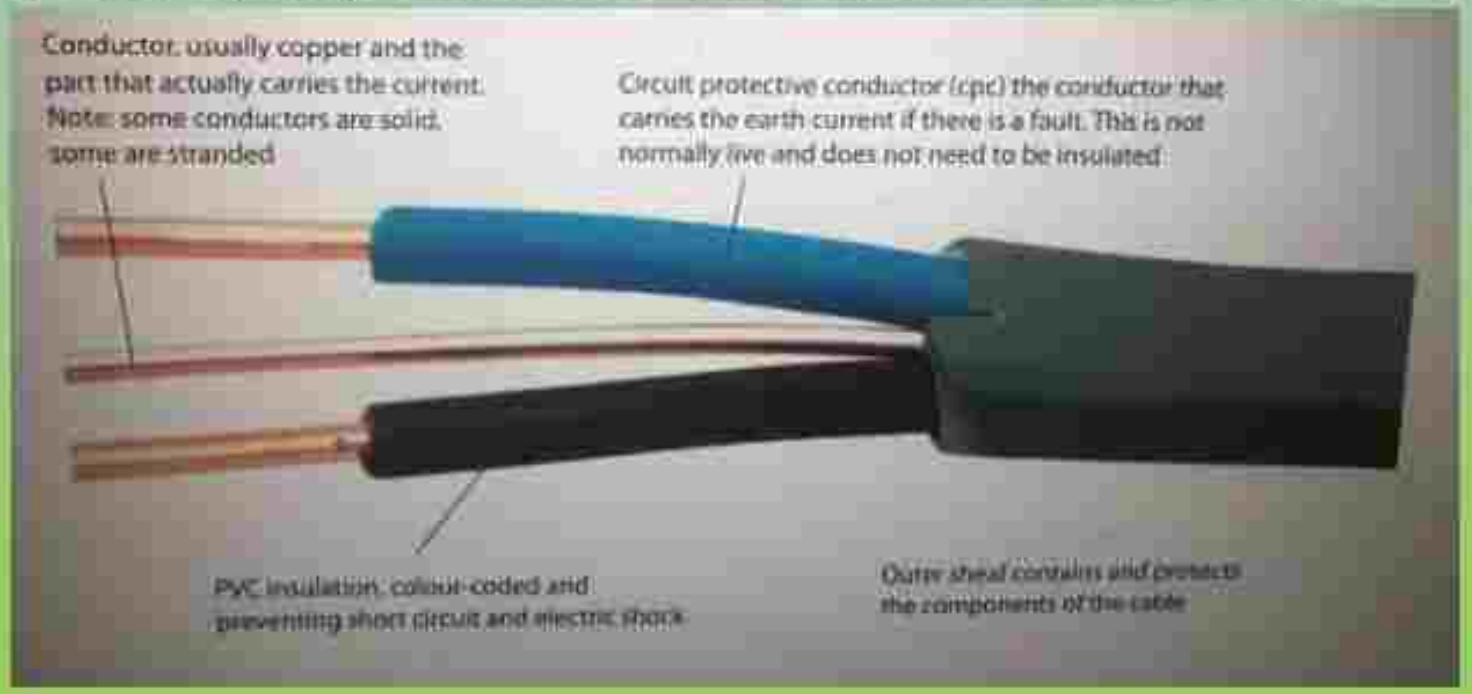
- Electrical wires are used to transport electric current, from electric meter to distribution box to power outlets (Plug sockets), all things get the supply through various electrical wires.
- There are 3 types of electrical wires
  - Live Wire
  - Neutral Wire
  - Earth Wire



- Each of the above wires contain different color codes depending on the country
- Wires with blue color are used for neutral connections, so those are the Neutral Wires. Then the wires with Brown,black or grey colors are used for live connections, so they are the Live Wires. If you see a Green or Yellow-Green wire, remember they are used for earth connections, which means those are the Earth Wires.

CABLES

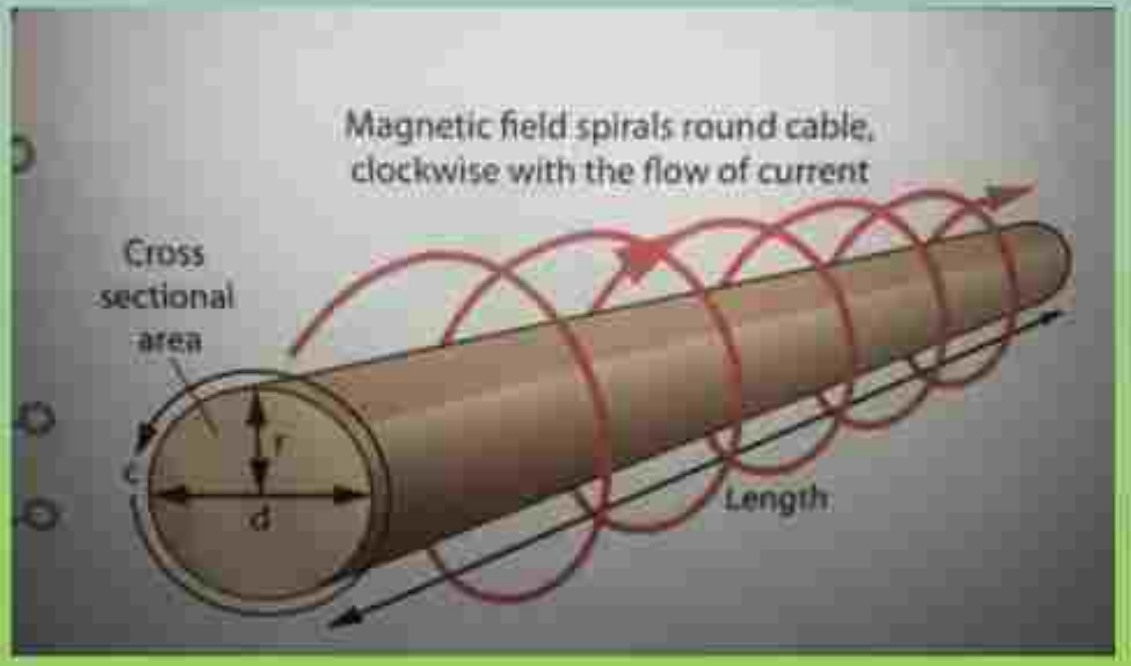
- Cables are the nervous system of all electrical installations, the method by which the electrical supply is carried. There are numerous types of cable, each designed for a particular job and environment. The amount of current a cable can carry depends on the cross-sectional area of its conductor. The larger the cross-sectional area, the more current it can take. It is, therefore, important to select the correct size for the job.



- Cables have two components to them. One is the conductor itself. This is usually made of copper. The other part is insulation, usually made from PVC, which forms a sheath around the conductor. The insulation is required to:
- prevent the conductors touching together; this could short the circuit and preventing it from working
- prevent users of the circuit from coming into contact with the conductors and receiving an electric shock.

- Modern non-metallic sheathed cables, consist of two to four wires covered with thermoplastic insulation, plus a bare wire for grounding (bonding), surrounded by a flexible plastic jacket.

- All materials have resistance to electrical current. Some materials have a resistance so high it is virtually impossible for any current to pass through them. These are called insulators and include plastic, glass and wood. Other materials have a very low resistance and allow current to pass through them easily. These are called conductors. This is a general rule.



- There are a number of factors that can reduce the amount of current a cable can carry. Among these are:
- **ambient temperature** – the temperature of the surrounding air
- **presence of other conductors** – cables produce heat when carrying current and when cables are bunched together their combined heat reduces current capacity
- **confined space** – if a cable is buried in a wall or run through conduit, its current-generated heat cannot escape
- **the length of run** – the longer the cable run the less current it can carry because, like water pressure in a pipe, the voltage is reduced the further you go from the power source

Conductors

- The choice generally is between copper and aluminium. Copper has better conductivity for a given cross-sectional area and is preferable, but its cost has risen over the years. Aluminium conductors are now sometimes preferred for the medium and larger range of cables.

Conductor	Advantages	Disadvantages
Copper	• Easier to joint and terminate • Smaller cross-sectional area for given current rating	• More costly • heavier
Aluminium	• Cheaper • Lighter • Not recommended for use in hazardous areas	• Bulkier for given current rating

Electrical Earthing

- The process of transferring the immediate discharge of the electrical energy directly to the earth by the help of the low resistance wire is known as **THE ELECTRICAL EARTHING**.
- The electrical earthing is done by connecting the non-current carrying part of the equipment or neutral of supply system to the ground.
- Mostly, the galvanised iron is used for the earthing. The earthing provides the simple path to the leakage current. The shortcircuit current of the equipment passes to the earth which has zero potential. Thus, protects the system and equipment from damage.

Types of Electrical Earthing

- The electrical equipment mainly consists of two non-current carrying parts. These parts are neutral of the system or frame of the electrical equipment. From the earthing of these two non-current carrying parts of the electrical system earthing can be classified into two types.

  - **Neutral Earthing**
  - **Equipment Earthing.**

Neutral Earthing

- In neutral earthing, the neutral of the system is directly connected to earth by the help of the GI wire.
- The neutral earthing is also called the system earthing. Such type of earthing is mostly provided to the system which has star winding.
- For example, the neutral earthing is provided in the generator, transformer, motor etc.

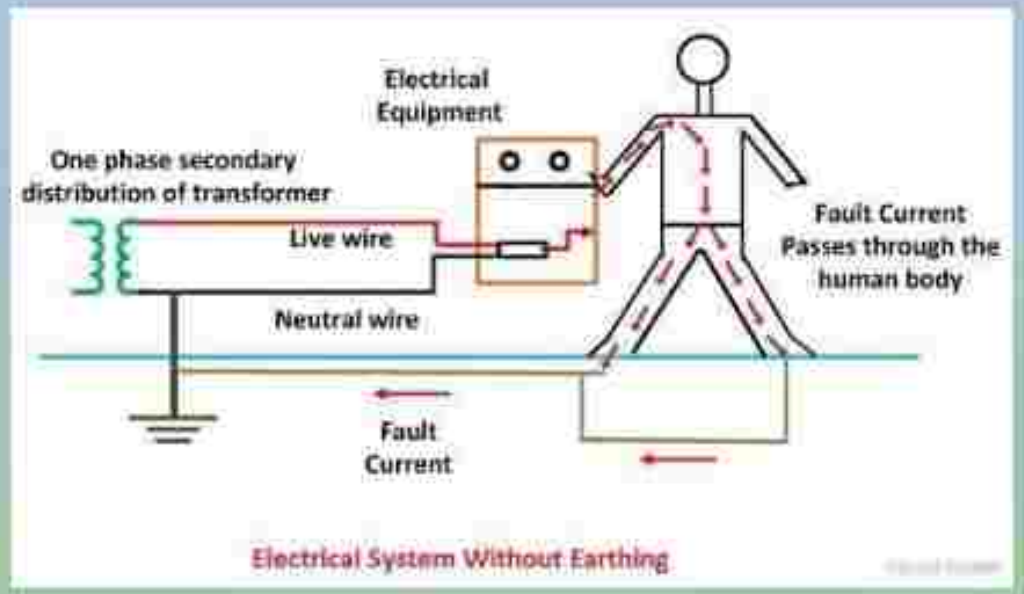
Equipment Earthing

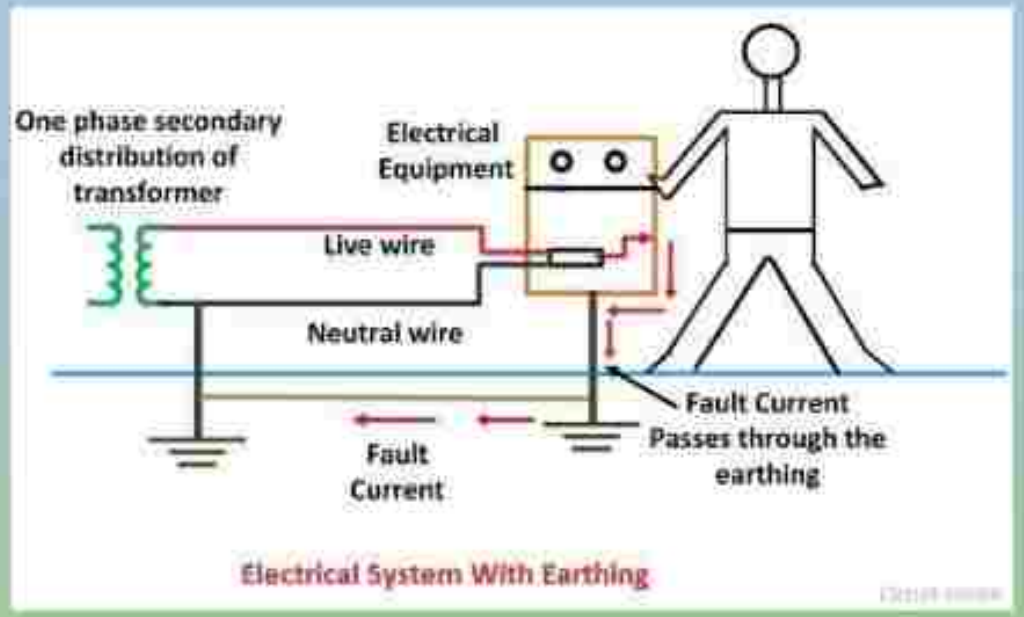
- Such type of earthing is provided to the electrical equipment. The non-current carrying part of the equipment like their metallic frame is connected to the earth by the help of the conducting wire.
- If any fault occurs in the apparatus, the short-circuit current to pass the earth by the help of wire. Thus, protect the system from damage.

Importance of Earthing

- The earthing is essential because of the following reasons

  - The earthing protects the personnel from the shortcircuit current.
  - The earthing provides the easiest path to the flow of shortcircuit current even after the failure of the insulation.
  - The earthing protects the apparatus and personnel from the high voltage surges and lightning discharge.
  - Earthing can be done by electrically connecting the respective parts in the installation to some system of electrical conductors or electrodes placed near the soil or below the ground level. The earthing mat or electrode under the ground level have flat iron riser through which all the non-current-carrying metallic parts of the equipment are connected.





- When the fault occurs the fault current from the equipment flows through the earthing system to the earth and thereby protect the equipment from the fault current. At the time of the fault, the earth mat conductors rise to the voltage which is equal to the resistance of the earth mat multiplied by a ground fault.

- The contacting assembly is called earthing. The metallic conductors connecting the parts of the installation with the earthing are called electrical connection. The earthing and the earthing connection together called the earthing system.

Digital Multimeter

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What is Digital Multimeter

It is a common and important laboratory instrument .It contains three different meters in one.

- It is use to measure AC or DC voltages
- It is used to measure AC/DC current and resistance with digital display.
- It gives digital output, which is very accurate. As the name suggest, multimeter are those measuring instruments which can be used to calculate multiple circuit characteristics.

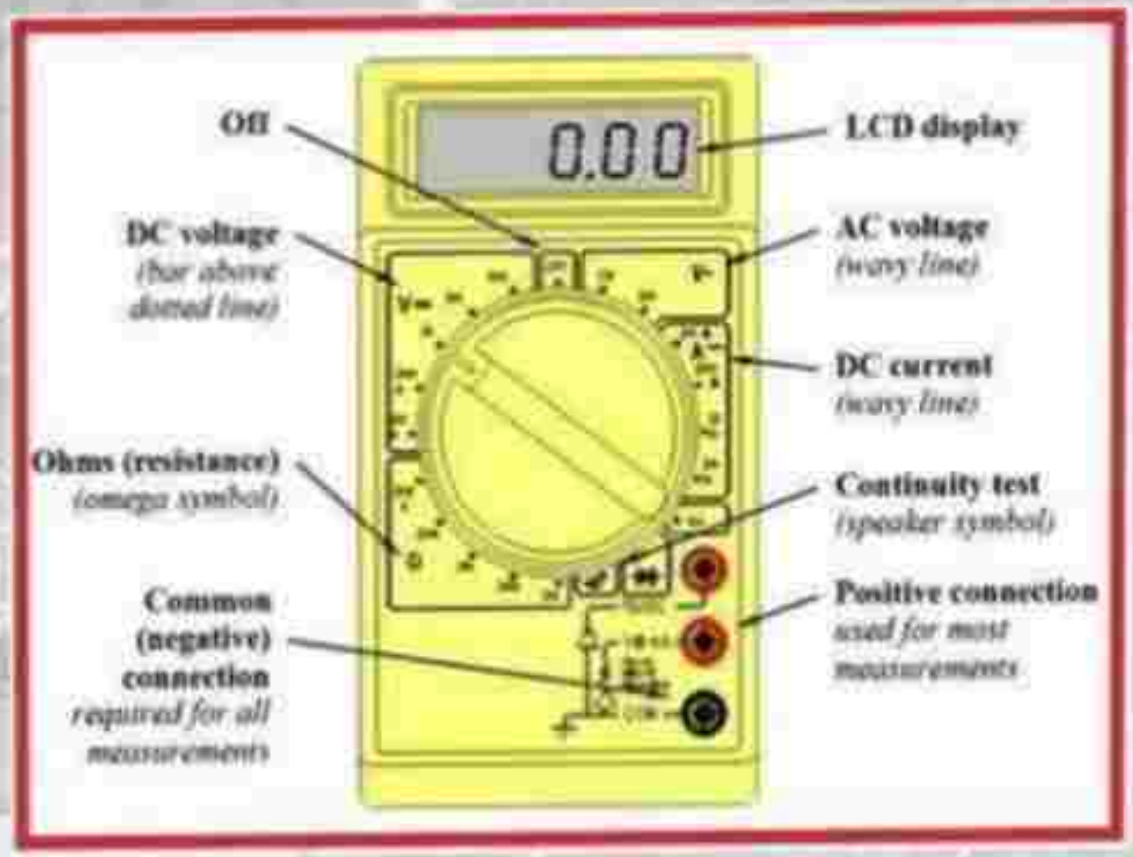
Parts of A Digital Multimeter

A Multimeter has there parts

a) Display b) selection knob c)Ports

Label Diagram and Common DMM Symbol

LABEL DIAGRAM



COMMON DMM SYMBOLS

~	AC Voltage	⏚	Ground
⎓	DC Voltage	⊣⊢	Capacitor
Hz	Hertz	µF	MicroFarad
+	Positive	µ	Micro
−	Negative	m	Milli
Ω	Ohms	M	Mega
⊣|⊢	Diode	K	Kilo
•)))	Audible Continuity	OL	Overload

Parts of A Digital Multimeter

- **PORTS**
- Two probes are plugged into two of the ports on the front of the units.
- **COM** stands for common and is almost always connected to the ground of a circuit.
- 10A is the special port used when measuring greater currents (greater than 200mA) CE
- MAVO is the port that the red probe is conventionally plugged into. This port allows te measurement of current (upto 200 mA), voltage and resistance.

- The PCB contains an assortment of various components including various types of resistors, capacitors, diodes and IC's. Also it host the battery, crystal oscillator, PTC, LCD and the buzzer which test the continuity of device under test.

DISPLAY

• A LCD is embedded on the PCB and is interfaced through pinouts on the PCB itself.

• A transparent plastic casing is over the LCD protecting it from the scratches. Also shock absorption is provided by the rubber pads closely attached at the top and bottom of the LCD.

• The display usually has four digits and the ability to display a negative sign.A few multimeter have illuminated displays for better viewing in low light situations.

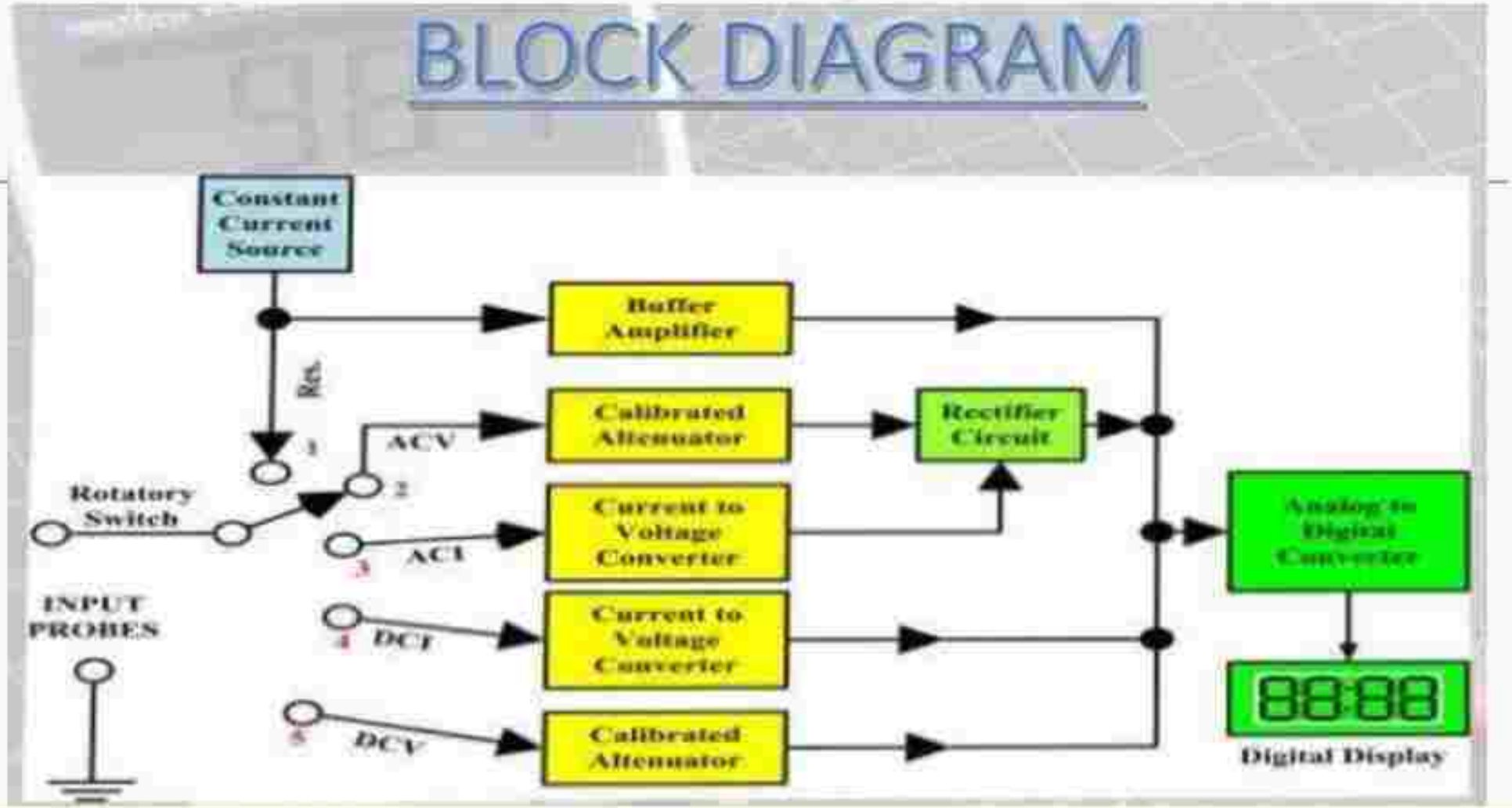
WORKING OF THE KNOB

• The PCB is bound to the top casing og the multimeter with the help of screws.A LCD and a rotary knob switch are sandwiched between the top casing and the other side of the PCB. Allso, the contacts for switching the multimeter ON and OFF can be seen.

• Some multimeter employs the rotary switch to handle the switching ON & OFF options while some requires a slider switch.

• The selection knob allows the user to set the multimeter to read different things such as milliamps (mA) of current, voltage and resistance

Block Diagram



Function switch Measuring Voltage

FUNCTION SWITCH MEASURING VOLTAGE

- The V⎓ (*) setting is for measuring DC voltages.
  Eg. battery voltage.
- The V~ (') setting is for measuring AC voltages.
  Eg. house voltage
- The 20 (') setting is to measure DC voltages in the volts (V) range.

MEASURING VOLTAGE

- Set the dial to the a value greater than the voltage being measured.
- For our labs, we will be working with the 20 V range.

Function switch Measuring Resistance & Current

FUNCTION SWITCH MEASURING RESISTANCE & CURRENT

- The Ω setting (*)is used to Measure electrical resistance in Ohms.

The A setting (*) is used to measure DC current in amps.

MEASURING RESISTANCE

Set the dial to a value greater than the resistor value being measured.

The 1 in the display means the resistance is higher than the current dial setting

For a 5000 ohm resistor, set the dial to 20K.

For a 300 ohm resistor, set the dial to 2000

Advantages and disadvantages of Digital Multimeter

Advantages

Very high accuracy

• Has very high input impedance which ensures less loading effect on the input

• The numeric display of digital meters provides zero parallax error.

Disadvantages

It does not do well with measurement fluctuations

• It is more expensive than the analog type

• It can be difficult to find one for your specific needs

Thank you

SEC PROJECT PRESENATAION

PHOTOS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