



2nd semester English-I (Internal exam 2021)

Answer the following questions (Each question is of FIVE marks)

1. Write a critical note on the different modes of Communication.

2. Discuss briefly the differences between Monologue and Dialogue.



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2nd semester English-I (Internal exam 2021)

Answer the following questions (Each question is



2nd semester English-I (Internal exam 2021).pdf

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Mathematical Methods of Physics-II

Internal Examination-2021 (Honours)

* Indicates required question

1. Email *
-

Internal Examination-2021
Department of Physics
Bidhan Chandra College, Asansol



Duration of Examination – 1 hr
Maximum Marks- 10

2. Name- *

3. Registration No.- *

4. Mobile Number *

BEST OF LUCK

Choose the correct option

Each Question carries 1 mark

5. 1. The sides of a rectangle are measured 15.3 cm and 9.6 cm. Each length has an uncertainty of 0.07 cm. The uncertainty in area of the rectangle is

Mark only one oval.

- 1.013 sq cm
 1.264 sq cm
 1.474 sq cm
 None of these

6. 2.

. The number of singularity of equation, $\frac{d^2y}{dx^2} + \frac{10}{3x(2-x)} \frac{dy}{dx} + \frac{11}{4x}y = 0$ is equal to

Mark only one oval.

- (a) Two (at $x=0$, $x=2$)
 (b) One (at $x=0$)
 (c) One (at $x=2$)
 (d) None of these

7. 3. The even function among the given functions is

Mark only one oval.

- $f(x)=x$
- $f(x)=\sin x$
- $f(x)=\cos x$
- None of these

8. 4. The value of $\operatorname{erf}(0)$ is

Mark only one oval.

- 0
- 1
- 1
- None of these

9. 5. The value of $B(m+1,n)+B(m,n+1)$ is- (B is used for beta function)

Mark only one oval.

- B(1,1)
- B(m,n)
- B(m+1,n+1)
- None of these

10. 6.

Rodrigue's formula for Legendre Polynomials is given by

$$(a) P_n(x) = \frac{1}{n!2^n} \frac{d^n}{dx^n} (x^2 - 1)^n$$

$$(b) P_n(x) = \frac{1}{n!2^n} \frac{d^{n+1}}{dx^{n+1}} (x^2 - 1)^{n+1}$$

$$(c) P_n(x) = \frac{1}{n!2^n} \frac{d^{-n+1}}{dx^{-n+1}} (x^2 - 1)^{-n+1}$$

$$(d) P_n(x) = \frac{1}{(n+1)!2^n} \frac{d^{n+1}}{dx^{n+1}} (x^2 - 1)^{n+1}$$

Mark only one oval.

a

b

c

d

11. 7.

If $H_n(x)$ be the Hermite polynomial, then $[2nH_{n-1}(x) + H_{n+1}(x)]$ is equal to

(a) $2H_n(x)$

(b) $2xH_n(x)$

(c) $xH_n(x)$

(d) $\frac{xH_n(x)}{2}$

Mark only one oval.

a

b

c

d

12. 8.

If $z=x+iy$, the imaginary part of e^{z^2} is

(a) $e^{x^2-y^2}(\sin 2xy)$

(b) $e^{x^2-y^2}(\cos 2xy)$

(c) $e^{x^2+y^2}(\sin 2xy)$

(d) $2e^{x^2-y^2}(\sin 2xy)$

Mark only one oval.

a

b

c

d

13. 9.

A function $f(x)$ is said to be analytic or regular, if $\sum_n \frac{f^n(a)}{n!} (x - a)^n$

- (a) Exists and converges to $f(x)$ in some open interval $b < a < c$
- (b) Does not exist but converges to $f(x)$ in $b < a < c$
- (c) Exists but does not converge to $f(x)$ in $b < a < c$
- (d) None of these

Mark only one oval.

- a
- b
- c
- d

14. 10.

The residue of $f(z) = \frac{z \cos z}{(z-\pi)^3}$ at $z=\pi$ is

(a) 0

(b) π

(c) $\frac{\pi}{2}$

(d) 2π

Mark only one oval.

a

b

c

d

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Department of Chemistry

NOTICE

It is hereby informed to all concerned that the **B Sc SEM II Internal Assessment Examination 2021 for Chemistry (Hons)** will be held as per schedule given below. The question paper will be uploaded 10 mins before the examination time in the respective group. All students have to appear for the examination at the stipulated date and time.

Date of the Exam.	Time	Course Code	Name of the Paper	Faculty Involved
24/09/2021	10 AM	BSCHCEMC202	Physical Chemistry - I (Lab)	S. S.
25/09/2021	10 AM	BSCHCEMC201	Organic Chemistry - II (Lab)	MSA
28/09/2021	10 AM	BSCHCEMC202	Physical Chemistry - I (Core 4)	S. S.
29/09/2021	10 AM	BSCHCEMC201	Organic Chemistry - II (Core 3)	SA

Dated: 20/09/2021

Sutapa Adhikari
Head, Dept. of Chemistry
Bidhan Chandra College Asansol-4



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Department of Chemistry

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It is hereby informed to all concerned that the **B Sc SEM II Internal Assessment Examination 2021 for Chemistry (Ge & Prog.)** will be held as per schedule given below. The question paper will be uploaded 10 mins before the examination time in the respective group. All students have to appear for the examination at the stipulated date and time.

Date of the Exam.	Time	Course Code	Name of the Paper	Faculty Involved
25/09/2021	10 AM	BSCHCEMGE201	Organic Qualitative Practical (Lab)	MSA
28/09/2021	10 AM	BSCHCEMGE201	Elementary Physical Chemistry & Organic Chemistry (GE – 2)	S. S.

Dated: 20/09/2021

Sutapa Adhikari 20.9.21
Head, Dept. of Chemistry
Bidhan Chandra College Asansol-4

Bidhan Chandra College B.Sc. SEM – II (Hons.)

INTERNAL ASSESSMENT EXAMINATION 2021

PAPER CODE: BCHEM 0203

PAPER NAME: Organic Chemistry-II

Name:

University Roll No.:

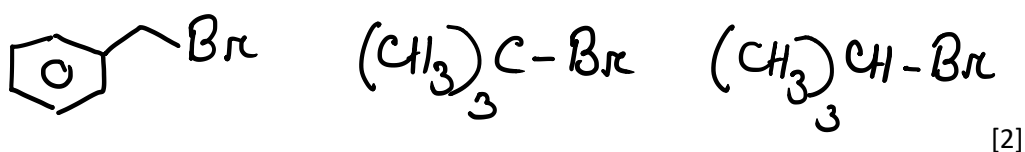
Registration No.:

F.M. = 10

Time: 30 mins

Answer any five questions.

1. Arrange the following compounds in order of their rate of S_N2 reaction and explain.

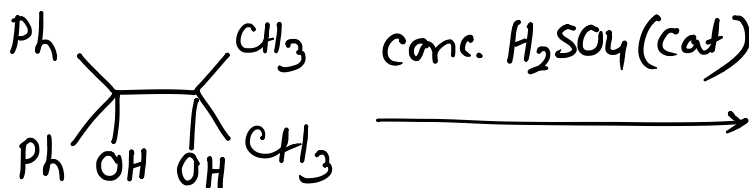


[2]

2. Give two methods of preparation of benzyne intermediates.

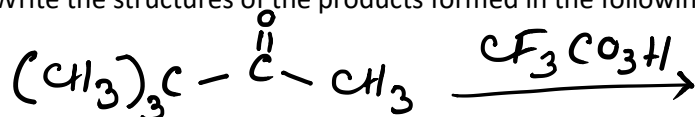
[2]

3. Predict the product(s) of the following reaction with the mechanism involved.



[2]

4. Write the structures of the products formed in the following reactions.

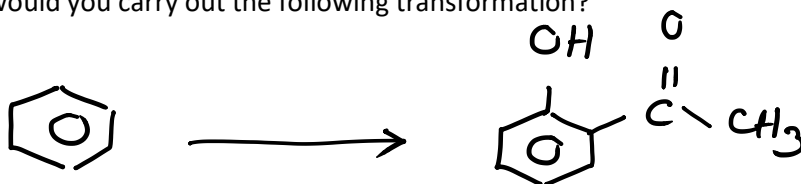


[2]

5. Hoffmann degradation involves the degradation of an acidamide to an amine. Give a suitable example and write the mechanism.

[2]

6. How would you carry out the following transformation?



[2]

7. What is ylide? give an application of ylide in organic synthesis. Give the relevant mechanism.

[2]

Name - Indrajit Mahato

University Registration No. - KNU20103002892

University Roll No - 1032003122008002

Award - B.Sc (HONS).

Discipline - Chemistry (Honours).

Course code - BSCH (EMC301).

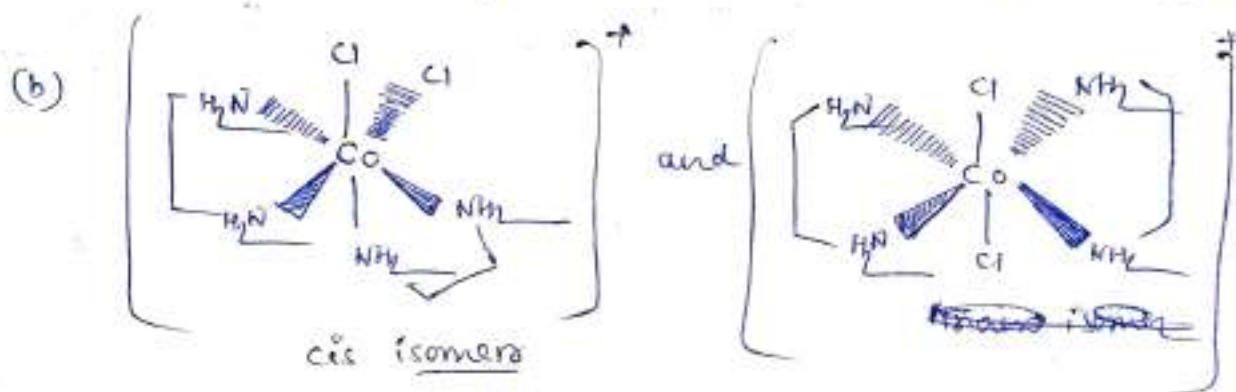
Course Type - CC

Course Name - Inorganic chemistry - II.

Date - 02-03-2022

Total Pages. (07)

1. (a) Non-innocent ligand :- NO (Nitrosyl ligand)



(c) clathrates :- clathrates is a structure in which water molecules under certain conditions bond to form complex networks of molecules forming cage like structures that encapsulate a guest molecule, which is a gas.

(g) Synergic effect :- In metal carbonyl compounds CO ligands donate its electron pair in a vacant σ -orbital of metal through σ -bond and metal also donates its electron in vacant antibonding orbital of CO ligand, this is known as Synergic effect.

(h) Anhydrous form of perchloric acid :- Cl_2O_7

$$2\text{HClO}_4 + \text{P}_4\text{O}_{10} \longrightarrow \text{Cl}_2\text{O}_7 + \text{H}_2\text{P}_4\text{O}_{11}$$
Dichlorine Heptoxide.

(b) Interstitial compounds : They are these compounds of the transition metals which are formed when small atoms like H, C & N are trapped inside the interstitial vacant spaces in the crystal lattices of the metals. They have high melting points.
examples :- TiC, TiH_{1.73}, Mn₃N, Fe₃H etc.

(c) Ionic Hydride :- NaH, KH.
Ionic Carbide :- CaC₂, Be₂C.

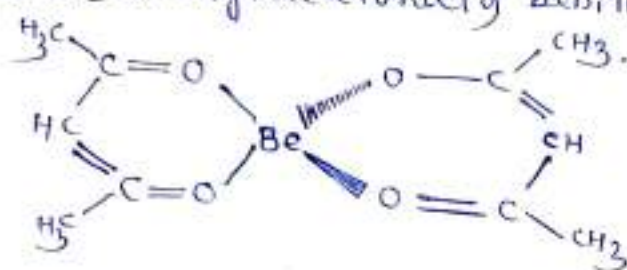
(d) Usanovich concept of acid & Base :-
An acid is any species capable of giving cations combining with anions or electrons or neutralizing a base to give a salt and a base is any species capable of giving up anions or electrons, combining with cations or neutralizing all acid to form salt.

examples :- Usanovich acids :- SO₃, Cl₂ etc.
Usanovich bases :- Na₂O, Na etc.

(e) $[Co(NH_3)_6]Cl_3 \rightleftharpoons 3Cl^- + [Co(NH_3)_6]^{3+} = 4 \text{ ions}$
 $K[CoCl_4] \rightleftharpoons K^+ + [CoCl_4]^- = 2 \text{ ions}$
 $K_4[Fe(CN)_6] \rightleftharpoons 4K^+ + [Fe(CN)_6]^{4-} = 5 \text{ ions}$
 $K_2[PbCl_4] \rightleftharpoons 2K^+ + [PbCl_4]^{2-} = 3 \text{ ions}$
 $\therefore K_4[Fe(CN)_6]$ has highest molar conductance.
& $K[CoCl_4]$ has lowest molar conductance.

(g) XeF₆ is fluxional molecule (non-rigid molecule). The gaseous XeF₆ molecule doesn't have a static structure. In this molecule the valence shell of Xe contains 6-bond pair electrons. The lone pairs continuously interchange its positions between various trigonal faces and also among the centre of faces. That's why it is an fluxional molecule.

[3] (a) (i) Inner metallic complex of first order is bis(acetylacetonato) beryllium (II).



(ii) The accumulated electrons on the metal centre from the $L \rightarrow M$ σ donation produces an unfavourable situation for the low oxidation state of the metal centre as the electropositive metal centre does not like the accumulation of much electron cloud. The π -acidic character (i.e. removal of electron cloud from the metal centre through the metal \rightarrow ligand π -back bonding of the π acid ligand can balance the unfavourable situation developed from the σ donation of the ligands i.e. π -acid ligands stabilizes the metal complex with low oxidation state.

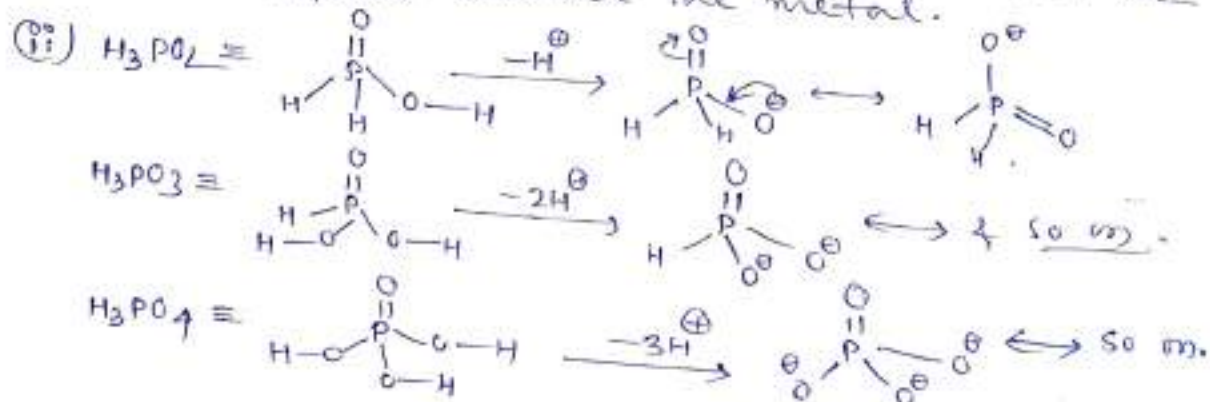
example: CN^- , CO , PR_3 etc.

Carbon monoxide formed σ -bond by donation i.p. of carbon and formed π -bond by donation electrons from metal to π^* of carbon monoxide

[P.T.O.]

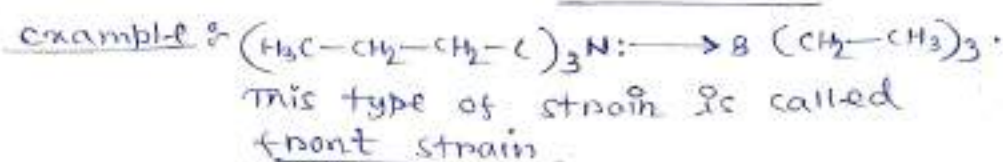
[3] [C] (9) In his co-ordination theory Werner introduced two great ideas & the assumption (weber)

1. In co-ordination complex a metal ion is engaged in strong binding with a certain number of neutral and/or anionic groups in the first sphere of attraction, now called the co-ordination zone or sphere.
2. The metal ion is surrounded by the neutral and/or anionic groups in the co-ordination zone in a definite geometrical arrangement.
3. In co-ordination compound metal centre exhibits two types of valencies —
 i) Primary valency & ii) secondary valency.
4. Primary valency are non-dimensional and secondary valency are directional which have a fixed orientation in space around the metal.



H_3PO_2 , H_3PO_3 and H_3PO_4 may be formulated as $H_2P(O)(OH)$, $HP(O)(OH)_2$ and $P(O)(OH)_3$. At first sight it does not appear possible to classify them according to Pauling's first rule. However their chemical properties and structures show that P-H bonds are present. Their chemical properties and structures suggest their formulas as more accurately written as $H_2P(O)(OH)$, $HP(O)(OH)_2$ and $P(O)(OH)_3$. These typical oxyacids have $(m-n) = 1$ and pK_a values corresponding to their structures as $pK_1 = 2.0$ for H_3PO_2 , $pK_1 = 1.8$ for H_3PO_3 and $pK_1 = 2.1$ for H_3PO_4 .

[3] (c) f-strain : When both the acid and bases have bulkier substituents in their structure, the adduct formation is hindered due to steric hindrance which is known as f-strain.



i) Major limitations of VBT in explaining the bonding in the co-ordination compounds —

- The basic defect in the theory is that attention is focused only on the orbitals of central atom and the importance of the ligands are not properly stressed.
- For outer orbital octahedral sp^3d^2 and tetrahedral sp^3 . The same no. of unpaired electrons are indicated. So that magnetic moment would be not distinguished between two stereochemistries.
- For d^7, d^8, d^9 configurations inner orbital octahedral complexes require promotion of non-bonding electrons to some orbitals, such promotions would make the electron vulnerable to oxidation. This mechanism can explain the easy oxidation of cobalt(II) complexes to cobalt(III). But experiments show that copper(II) complexes are hard to synthesize.
- Very often the complexes of transition metal ions are characterised by their colour. But no convincing explanation is available for VBT.
- It does not explain the spectra of complexes.
- It can not explain take into account the splitting of d-energy levels.

[4] (a) (i) Inorganic benzene is known as Borazine ($B_3N_3H_6$). It is B, N, H containing compound consist of alternating double bond between B and N. This compound is iso-electronic with benzene, hence it is called inorganic benzene.

ii) Synthesis : $B_3N_3H_6$ can be prepared in the laboratory by heating a mixture of $LiBH_4$ and NH_4Cl in vacuum at $230^\circ C$



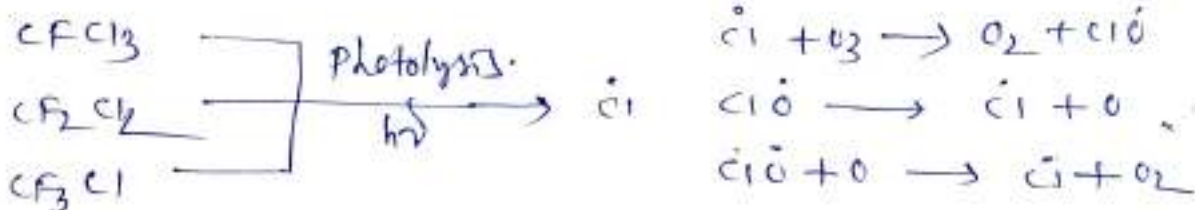
iii) Hydrolysis : Borazine is hydrolysed by water to produce boric acid ($B(OH)_3$) or (H_3BO_3).



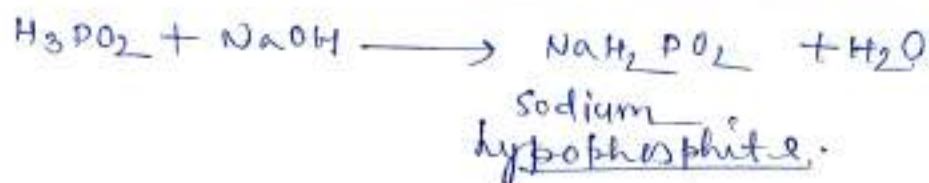
(ii) Mixed chlorofluro carbons such as $CFCl_3$, CF_2Cl_2 and CH_3Cl are known as freons.

Freons are very much more effective greenhouse gases than CO_2 . The freons have penetrated the upper atmosphere and causing damage to the ozone layer.

Freons in upper atmosphere undergo photolytic reaction which produce chlorine free radicals which readily reacts with ozone the ClO radicals which readily reacts with ~~ozone~~ formed decompose slowly reforming Cl radicals which further reacts with ozone. The chlorine radicals do not recombine to form Cl_2 .

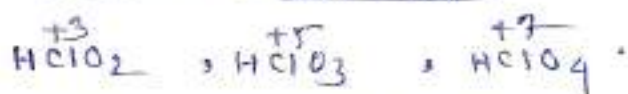


④ (iii) The salt obtained by reaction of hypophosphorus acid with caustic soda solⁿ -

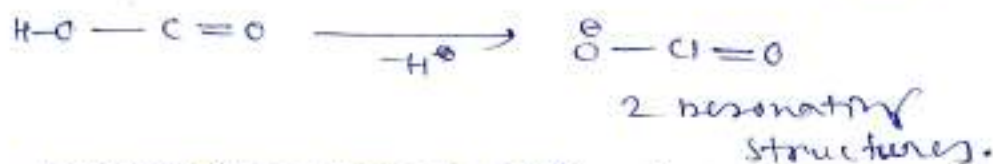
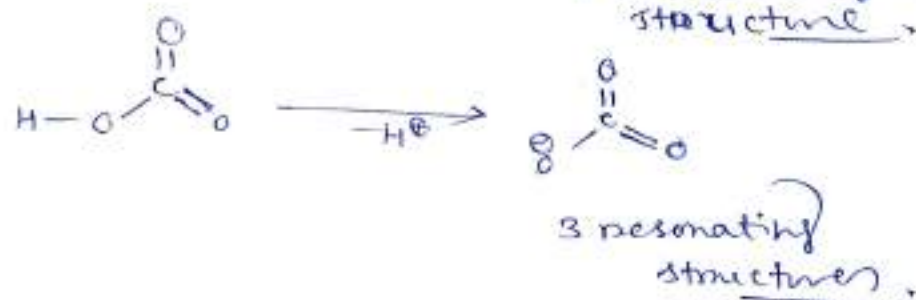
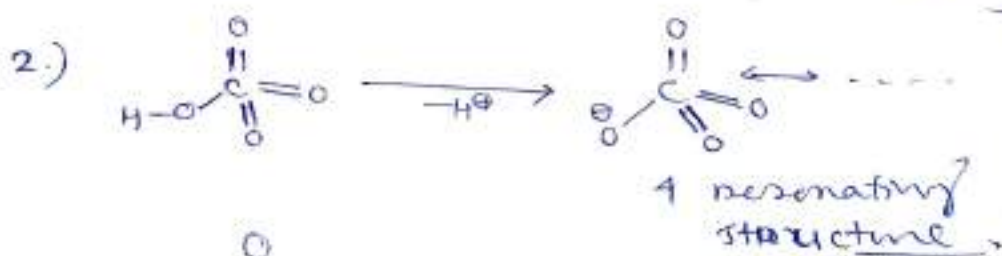


(iv) The given acidity order is _____
 $\text{HClO}_2 < \text{HClO}_3 < \text{HClO}_4$.

1) We know that strength of oxoacids increases with the increase in the oxidation state of the central metal ion.



$\therefore \text{HClO}_4 > \text{HClO}_3 > \text{HClO}_2$ (Decreasing order).



Resonating structures \uparrow , stability of conjugate base \uparrow and corresponding acid is more stronger.

Hence the order is $\text{HClO}_4 > \text{HClO}_3 > \text{HClO}_2$