

240413

RIZVI COLLEGE OF A/S/C

ASC010224

FOUNDATION COURSE

PAPER -II (Sem II)

(2 1/2Hours)

Total Marks : 75

N.B : (1) All questions are compulsory.

(2) Figures to the right indicate full marks.

Q.1.(A) Choose the correct alternative (Any eight) :

08 Marks

i) _____ means movement or shift of people from one place to another.

(Migration, Liberalisation, Globalisation, Privatisation)

ii) _____ is known as the Silicon Valley of India.

(Kashmir, Mumbai, Pune, Bangalore)

iii) Human Rights with special reference to Fundamental Rights are enshrined in the _____ of the Indian Constitution.

(I, II, III, IV)

iv) Human rights have _____ application.

(Limited, Maximum, Universal, Most)

v) _____ feed on both the autotrophs and the consumers.

(Decomposers, Herbivorous, Carnivorous, Omnivorous)

vi) The _____ is the solid, rocky, crust covering entire planet.

(Lithosphere, Hydrosphere, Biosphere, Atmosphere)

vii) _____ means pre_judgement.

(Aggression, Violence, Prejudice, Preservation)

viii) _____ conflict is seen in situations where two parties trying to solve a problem together, become aware that all the issues are incompatible.

(Cognitive Conflict, Affective Conflict, Structural Conflict, Behavioural conflict)

ix) According to Abraham Maslow's belief _____ needs all human beings have a need to be respected and to have self-respect.

(Transcendence, Physical, Esteem, Self-Actualization)

x) Divorce is _____ kind of stress.

(Organisational, Environmental, Background, Personal)

(B) State whether the following statements are True or False (Any seven) : 07Marks

i) Globalisation has resulted in no competition to small scale units

- ii) Maharashtra has the largest number of farmers' suicide cases.
- iii) The right against exploitation provides for abolition of child labour only.
- iv) Human Rights are never absolute.
- v) Poverty and environment are not inter-linked.
- vi) Ecology helps us to understand the ecosystem.
- vii) Personal factors are the only causes of stress.
- viii) Prejudice does not cause any conflict.
- ix) All individuals need to have same set of needs.
- x) Compromising helps in conflict resolution.

Q. 2 . "Globalization has led to the changes in agrarian sector".Discuss.

15 Marks

OR

Q.2 How far Information and Communication Technology is effective in our day today life?

Q.3.What are the fundamental rights of an Indian citizen ?Explain its significance.

15 Marks

OR

Q.3.What is Magna Carta about?Describe the characteristics of Human Rights .

Q.4.W hat is the impact of environmental degradation on human life?How can it be controlled? 15Marks

OR

Q.4.Explain the concept of sustainable development and bring out the need for it.

Q.5..Discuss the agents of socialisation. 15Marks

OR

Q.5 Write short notes on (any three) :

(i)Migration

(ii)Liberalisation

(iii)Abraham Maslow's theory of Self-actualisation

(iv)Human Values

(v)Stress Management

240415

15/04/24 SEM - II

5030224

RIZVI COLLEGE OF ARTS, SCIENCE AND COMMERCE
F.Y.B.Sc. CHOICE BASED (REGULAR 2023-24) SEMESTER-III CHEMISTRY: PAPER I

(Time: 2½ Hours)

Total Marks: 75

- N.B.: (1) All questions are compulsory.
(2) Figures to the right indicate full marks.
(3) Use of log table/ non-programmable calculator is allowed.

Q1 A Multiple choice question (any 5 out of 7)

5M

- There pressure P in the ideal gas equation is replaced by ____
a) $P + an^2/V^2$ b) $P/a - n^2/V^2$ c) $P + 2n^2/V^2$
- For one mole of a gas the ideal gas equation is _____.
a) $PV = RT$ b) $PV = 1/2RT$ c) $PV = 3/2RT$
- The SI unit of conductance is _____.
a) Mho cm b) $S^{-1} cm^{-1}$ c) Sm^{-1}
- $Fe^{2+} \rightleftharpoons Fe^{3+} + e^-$ in this electrode reaction _____.
a) Ferric ions under goes oxidation b) Ferrous ions under goes oxidation c) Ferrous ions under goes reduction
- The value of equilibrium constant depends on _____.
a) Temperature b) Pressure c) Concentration of reactants
- The reaction $2SO_3(g) \rightleftharpoons 2SO_2(g) + O_2(g)$ is _____.
a) Reversible reaction b) Irreversible reaction c) Chain reaction
- When a salt dissolves in water, entropy _____.
a) Increases b) Decreases c) Remains constant

Q1 B Match the columns (any 5 out of 7)

5M

- | | | | |
|---|---------------------|----|-----------------------|
| 1 | Lewis base | a) | Qualitative analysis |
| 2 | Arrhenius acid | b) | Soft base |
| 3 | What is present | c) | Violet fumes |
| 4 | How much is present | d) | Hard base |
| 5 | Iodine gas | e) | H^+ acceptor |
| 6 | Cl^- | f) | Brown fumes |
| 7 | I^- | g) | H^+ donor |
| | | h) | Quantitative analysis |

Q1 C True or False (any 5 out of 7)

5M

- If two atoms or a groups are lost from the adjacent carbon atom it is called α -elimination.
- Alkanes undergoes elimination reaction.
- In E_2 mechanism 2 stands for bimolecular.
- Diels alder reaction is a type of free radical reaction.
- $RhCl (PPh_3)_3$ is known as Wilkinson's catalyst.
- Alkyl halide are coupled with sodium metal is known as diels aldar reaction.
- Ozonolysis is carried out with alkyne.

Q2 Attempt any 4

20M

RIZVI COLLEGE OF ARTS, SCIENCE AND COMMERCE

F.Y.B.Sc. CHOICE BASED (REGULAR 2023-24) SEMESTER-II CHEMISTRY: PAPER I

- A Calculate the volume of 10 moles of a gas at $1.013 \times 10^7 \text{ Nm}^{-2}$ pressure and 273K, if its compressibility factor is 0.783.
- B What is meant by ideal gas and real gas? Explain with suitable examples.
- C If the resistance of the cell is 100 ohms, the length and area of the cell is 0.8 cm & 0.7628 cm^2 . Calculate kappa (k) for this cell. What is kappa?
- D Explain the difference between electrochemical or galvanic cell and electrolytic cell with suitable examples.
- E What are reversible and irreversible reactions? Explain with examples.
- F Why was second law of thermodynamics needed? State second law of thermodynamics in different ways.

Q3 Attempt any 4

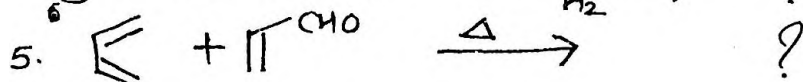
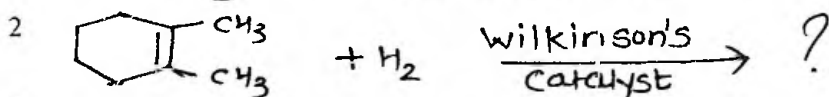
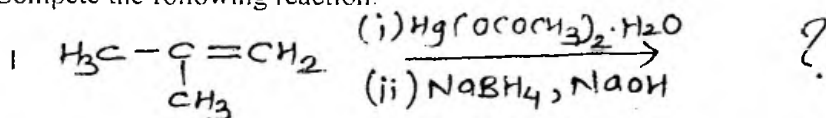
20M

- A How will you detect the gases evolved from the following salts (Give reaction and detection)?
i) CaCO_3 ii) KBr iii) KI iv) Cu(OH)_2 v) Na_2S
- B What following reagent papers are used to detect (Give reaction)?
i) Potassium dichromate
ii) Dimethyl glyoxime
iii) Lead acetate paper
iv) Starch iodide paper
v) Oxine paper
- C The solubility of BaSO_4 in water is $2.42 \times 10^{-3} \text{ g. dm}^{-3}$ at 298 K. The value of solubility product will be _____?
(Molecular weight of $\text{BaSO}_4 = 233 \text{ g mol}^{-1}$)
- D Give the application of HSAB concept.
- E Differentiate between Hard bases and Soft bases (4 points). Classify Cl^- , Br^- , and I^- into the hard base, soft base, and borderline base.
- F Differentiate between Class 'a' and Class 'b' metal

Q4 Attempt any 4

20M

- A What is halogenation? Give the mechanism of chlorination of methane.
- B Complete the following reaction:



- C Explain 1,2 - addition and 1,4- addition reaction with suitable example.
- D Discuss ozonolysis of alkene with suitable example.
- E Explain the mechanism of E_1 reaction giving energy profile diagram.
- F Explain Wurtz and Wurtz fitting reaction with suitable example.

240416

ATKT

S100224

F.Y.B.SC CHOICE BASED (ATKT 2023-24) SEMESTER II CHEMISTRY: PAPER II

(Time: 3 hours)

Total Marks: 100

N.B.: (1) All questions are compulsory.

(2) Figures to the right indicate full marks.

(3) Use of log table/ non-programmable calculator is allowed.

Q1 A Attempt any 10 out of 15**15M**

- 1 Compounds which are poor conductors of electricity are called _____ electrolyte.
a) strong b) weak c) non
- 2 Naphthalene is electrolyte.
a) strong b) weak c) non
- 3 _____ is weak acid.
a) HBr b) HCN c) Ethanol
- 4 The reactions which are caused by heat in the absence of light is called ____ reaction.
a) photochemical b) dark c) reversible
- 5 Which is electromagnetic radiation that has the lowest frequency?
a) Micro waves b) Radio waves c) Gamma rays
- 6 _____ bond is formed between two electronegative elements.
a) Covalent b) Metallic c) Ionic
- 7 On the basis of VSEPR theory, _____ is an example of AB_2E_2 molecule.
a) H_2O b) $BeCl_2$ c) SO_2
- 8 For _____ molecule, steric number is 4.
a) linear b) tetrahedral c) octahedral
- 9 Molecule having one lone pair is _____.
a) H_2O b) NH_3 c) CH_4
- 10 In an oxidation process, the oxidation number of the element _____.
a) Increases b) decreases c) remains the same
- 11 Pyridine ring contain.....as hetero atom.
a) N b) O c) S
- 12 Thering has minimum angle strain.
a) cyclobutane b) cyclohexane c) cyclopropane
- 13compounds are unsaturated close chain compounds.
a) aliphatic b) Aromatic c) non-aromatic
- 14 The no. of π -electron in benzene.....
a) 4 b) 5 c) 6
- 15 Introduction ofgroup in aromatic ring is called sulphonation.
a) Nitro b) Sulphonic c) Alkyl

F.Y.B.SC CHOICE BASED (ATKT 2023-24) SEMESTER II CHEMISTRY: PAPER II

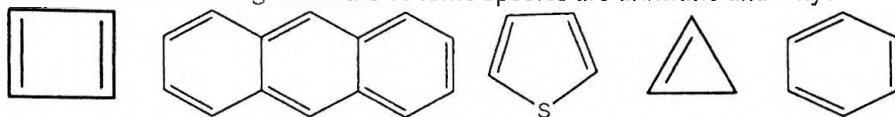
- Q1 B Match the following (any 5)** **05M**
- | | | |
|---|--|------------------------|
| 1 | Degree of dissociation of weak electrolyte | a) hetero aromatic |
| 2 | pH | b) 90° |
| 3 | Bond angle of BeCl_2 | c) Less than 1 |
| 4 | Bond angle of BCl_3 | d) deactivating group |
| 5 | Pyridine | e) 120° |
| 6 | -CHO | f) 180° |
| 7 | Cyclobutane | g) $-\log[\text{H}^+]$ |
- Q1 C True or False (any 5)** **05M**
- 1 Benzoic acid is a strong electrolyte.
 - 2 Thermal reaction occurs due to absorption of light energy
 - 3 X-rays are used to treat cancerous tumors by destroying the cancer cells.
 - 4 Water is a non-linear molecule.
 - 5 Oxidation involves gain of electron.
 - 6 Naphthalene is non-aromatic in nature.
 - 7 The Bond angle in cyclohexane is 120° .
- Q2 Attempt any 4** **20M**
- A Differentiate between strong and weak electrolytes.
 - B Give the postulates of Arrhenius Theory of ionisation.
 - C Explain the terms (i) Buffer solution. (ii) Buffer capacity
 - D What are photochemical reactions? How do they differ from ordinary thermal reactions?
 - E Mention any five regions of electromagnetic radiations and give their wavelengths.
 - F State Beer-Lambert's Law. What are the deviations from Beer-Lambert's Law?
- Q3 Attempt any 4** **20M**
- A Explain the formation of covalent bond. List the general characteristics of covalent compounds (4 characteristics)
 - B What do you mean by isoelectronic. Explain whether the following are isoelectronic or not.
 - i) N_3 and CO_2
 - ii) N_3^- and NO_2^+
 - C On the basis of VSEPR theory, predict the shape of XeF_4 molecule.
 - D Using VSEPR theory, explain why ClF_3 is T-shaped.
 - E Calculate the oxidation number for the following
 - i) Cr in K_2CrO_4
 - ii) P in P_2S_5
 - iii) Fe in Fe_3O_4
 - iv) Cl in HClO_4
 - v) N in HNO_2
 - F Explain the following terms
 - i) Oxidising agent
 - ii) Reducing agent
 - iii) Oxidation
 - iv) Reduction
 - v) Redox reaction

Q4

Attempt any 4

20M

- A Give the mechanism of friedal craft alkylation.
 B Which of the following molecule or ionic species are aromatic and why?



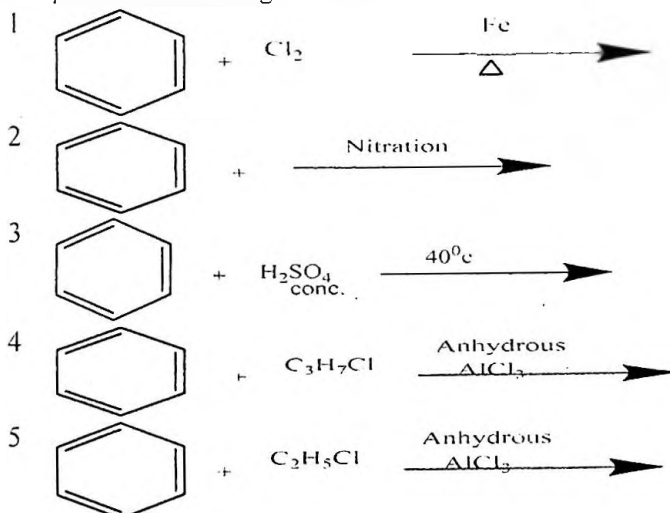
- C What are the conditions which must be satisfied for a compound to be aromatic.
 D Explain different types of strain in cycloalkanes.
 E Give the classification of aromatic compound on the basis of structure.
 F Explain sulphonation of benzene with its mechanism.

Q5

Attempt any 4

20M

- A What are different type of buffers? Explain any one of them with example.
 B Write short notes on:
 (i) Fluorescence
 (ii) Phosphorescence
 C Balance the following equation by the oxidation number method
 $Zn + HNO_3 \longrightarrow Zn(NO_3)_2 + N_2O + H_2O$
 D Differentiate between Iodimetry and Iodometry titrations.
 E Complete the following reaction.



- F Write a note on activated and deactivated aromatic rings with suitable examples.

RIZVI COLLEGE OF ARTS, SCIENCE AND COMMERCE
F.Y.B.Sc. CHOICE BASED (REGULAR 2023-24) SEMESTER-II CHEMISTRY: PAPER II

Q2 Attempt any 4 **20M**

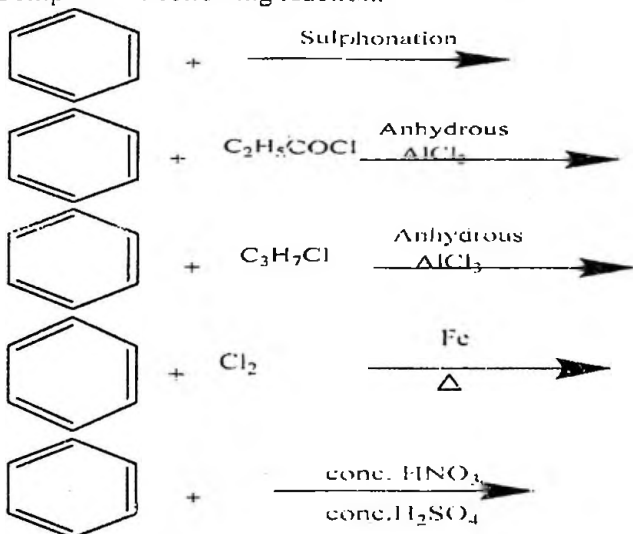
- A** Define and give examples for-
 (i) Strong electrolyte, (ii) Weak electrolyte
- B** With example explain neutral buffer.
- C** Give the postulates of Arrhenius Theory of ionisation.
- D** What are photochemical reactions? How do they differ from ordinary thermal reactions?
- E** Mention the laws of photochemistry.
- F** State Beer-Lambert's Law. What are the deviations from Beer-Lambert's Law?

Q3 Attempt any 4 **20M**

- A** Explain the formation of covalent bond. List the general characteristics of covalent compounds (**4 characteristics**)
- B** What do you mean by isoelectronic. Explain whether the following are isoelectronic or not.
 i) N_3 and CO_2
 ii) N_3^- and NO_2^+
- C** On the basis of VSEPR theory, predict the shape of XeF_4 molecule.
- D** Using VSEPR theory, explain why ClF_3 is T-shaped.
- E** Calculate the oxidation number for the following
 i) Cr in K_2CrO_4 ii) P in P_2S_5 iii) Fe in Fe_3O_4 iv) Cl in $HClO_4$ v) N in HNO_2
- F** Explain the following terms
 i) Oxidising agent ii) Reducing agent iii) Oxidation iv) Reduction v) Redox reaction

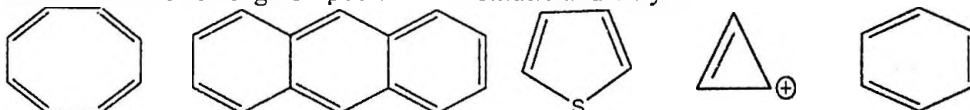
Q4 Attempt any 4 **20M**

A Complete the following reaction.



B Write a note on activated and deactivated aromatic rings with suitable examples.

C Which of the following compound are aromatic and why?



D What are the criteria which satisfied for a compound to be aromatic.

E Give the mechanism of friedal craft alkylation.

F What is conformational analysis ? Draw various conformation of cyclohexane.

240416

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RIZVI COLLEGE OF ARTS, SCIENCE AND COMMERCE
F.Y.B.Sc. CHOICE BASED (REGULAR 2023-24) SEMESTER-II CHEMISTRY: PAPER II

(Time: 2½ Hours)

Total Marks: 75

- N.B.: (1) All questions are compulsory.
 (2) Figures to the right indicate full marks.
 (3) Use of log table/ non-programmable calculator is allowed.

Q1 A Multiple choice question (any 5 out of 7)

5M

- 1 Law of mass action cannot be applied to _____ electrolyte.
 a) strong b) non c) weak
- 2 Degree of ionisation of electrolyte depends on _____.
 a) Concentration b) Temperature c) a & b both
- 3 Ammonian hydroxide and ammonium chloride in equal concentration is buffer.
 a) neutral b) acidic c) basic
- 4 _____ buffer is prepared by mixing a weak base and its salt with strong acid.
 a) neutral b) acidic c) basic
- 5 Which of the following are the principle laws of photochemistry?
 a) Grotthus-Draper and Stark-Einstien Law b) Raults and Daltons Law c) Lambert's and Beer's Law
- 6 As the frequency of the electromagnetic radiation increases the energy of the radiation _____.
 a) increases b) decreases c) remains the same
- 7 According to Beer-lamberts law, the plot of absorbance versus concentration is a _____.
 a) Straight line passing through the origin with a positive slope b) Straight line passing through the origin with a negative slope c) Straight line with a positive slope and an intercept in the Y-axis

Q1 B Match the columns (any 5 out of 7)

5M

- | | | | |
|---|------------------------|----|--|
| 1 | Ionic bond | a) | Loss of electron |
| 2 | Covalent bond | b) | Trigonal Planar geometry |
| 3 | Oxidation | c) | Tetrahedral geometry |
| 4 | Reduction | d) | Electropositive + Electronegative elements |
| 5 | Coordination Number= 3 | e) | Gain of electron |
| 6 | Coordination Number= 4 | f) | Trigonal Bipyramidal geometry |
| 7 | Coordination Number= 5 | g) | Electronegative + Electronegative elements |
| | | h) | Electropositive + Electropositive elements |

Q1 C True or False (any 5 out of 7)

5M

- 1 Pyridine is aromatic in nature.
- 2 The Bond angle in cyclohexane is 120°.
- 3 Cyclopropene is a non-benzenoid compound.
- 4 Introduction of halogen atom in aromatic ring is called sulphonation.
- 5 The cyclopropane ring has minimum steric strain.
- 6 Groups like $\text{C}=\text{O}$, $-\text{CHO}$, NO_2 are electron withdrawing group.
- 7 Aromatic compounds are unsaturated closed chain compounds.

240418

5140224

F.Y.B.Sc. SEMESTER – II EXAMINATION APRIL - 2024MATHEMATICS Paper – I: CALCULUS – II (Revised)Time: $2\frac{1}{2}$ Hours

Total Marks: 75

Note: 1. All questions are compulsory.

2. Figures to the right indicate full marks.

Q (1) Attempt any FOUR questions from the following: ($4 \times 5 = 20$ Marks)a) If $\lim_{x \rightarrow a} f(x) = l$ and $\lim_{x \rightarrow a} g(x) = m$ then prove that

$$\lim_{x \rightarrow a} (f(x) + g(x)) = l + m$$

b) Show that $\lim_{x \rightarrow 3} f(x)$ as $x \rightarrow 3$ exists, if $f(x) = 6x + 4$ by using $\epsilon - \delta$ definition.c) State the Sandwich theorem for limits. Hence find $\lim_{x \rightarrow \frac{\pi}{2}} f(x)$ if

$$10\sin x - 8\cos x \leq f(x) \leq 8\cos x + 10\sin^3 x.$$

d) Examine the continuity of $f(x)$ at $x = 1$ and $x = 2$ where $f(x)$ is defined by

$$f(x) = \begin{cases} 2x + 5, & 0 \leq x \leq 1 \\ 3x + 4, & 1 \leq x \leq 2 \\ x + 2, & 2 \leq x \leq 3. \end{cases}$$

e) Evaluate $\lim_{x \rightarrow \infty} \left[\frac{6x^3 + 4x + 1}{3x^3 + 7x - 6} \right]$ Q (2) Attempt any FOUR questions from the following: ($4 \times 5 = 20$ Marks)a) If $f: I \rightarrow \mathbb{R}$ is differentiable at $p \in I$ then show that f is continuous at p . Is the converse true? Justify your answer.b) Find the n^{th} derivative of $y = e^{ax} \sin(bx + c)$ where $a, b, c \in \mathbb{R}$ c) If $y = a \cos(\log x) - b \sin(\log x)$,

$$\text{show that } (x^2)y_{n+2} + (2n + 1)xy_{n+1} + (n^2 + 1)y_n = 0$$

d) When do you say that a function $f(x)$ is differentiable at $p \in I$? Hence show that the function $f: \mathbb{R} \rightarrow \mathbb{R}$ given by

$$f(x) = \begin{cases} x^2 \sin\left(\frac{1}{x}\right), & x \neq 0 \\ 0, & x = 0 \end{cases} \quad \text{is differentiable at } 0.$$

e) Let $f, g: I \rightarrow \mathbb{R}$ be the two differentiable functions defined at $p \in I$. Show that $f + g$ and $f - g$ are also differentiable at $p \in I$.

Q (3) Attempt any FOUR questions from the following: (20 Marks)

a) Verify Lagrange's Mean value theorem for the function $f(x) = x(4 - x)$, $x \in [0, 1]$

b) Find the local maximum and minimum of $f(x) = x + \left(\frac{25}{x}\right)$, $x \neq 0$

c) Find the point of inflection on the curve $y = x^3 - 9x^2 + 7x - 6$

d) Find the approximate value of $(81.16)^{\frac{1}{4}}$ upto four places of decimals using Taylor's theorem.

e) State and prove Rolle's Mean Value Theorem.

Q (4) Attempt any THREE questions from the following: (15 Marks)

a) If $f(x) = x^2 + 2$ and $g(x) = \frac{x+1}{3x-2}$ then find $f \circ g(x)$ and $g \circ f(x)$ as $x \rightarrow 2$.

b) Show that the function $f(x) = \sin x$ is continuous for all $x \in \mathbb{R}$.

c) Find $\frac{dy}{dx}$ for the function $x^2 + y^2 = 2xy^3$

d) Find the n^{th} derivative of $y = \sin(ax + b)$.

e) Find the expansion of $f(x) = e^x$

f) Evaluate $\lim_{x \rightarrow 0} \left(\frac{e^x - e^{-x} - 2\log(1+x)}{x \sin x} \right)$

240419

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FYBSC SEM II REGULAR APRIL 2024
MATHEMATICS II

MARKS:75

TIME DURATION: 2 Hrs. 30 Min.

Q.1 Attempt any Four.**(20)**

- (i) There are 3 bus routes from the city A to city B and 5 bus routes from city B to city C. How many ways a man can travel from A to C via B? How many ways he can take a round trip if he doesn't want to use any bus route more than once?
- (ii) Prove that, $S(n, k) = S(n, k-1) + k \cdot S(n-1, k-1)$, $n > 1$
- (iii) Prove that, the number of subsets of a finite set having cardinality n is 2^n .
- (iv) Prove that the set of integers Z is countable.
- (v) If seven numbers are to be chosen from the numbers 1 to 12 then prove that, there is at least one pair which will add up to 13.

Q.2 Attempt any Four.**(20)**

- (i) Find the coefficient of $x_1^2 x_3^2 x_4^3$ in the expansion of $(x_1 + x_2 + x_3)^7$.
- (ii) If a school has 100 students with 50 students taking French, 40 students taking Latin, and 20 students taking both languages, how many students take no language?
- (iii) Find the number of integers between 1 and 1000, inclusive, that are not divisible by 5, 6, and 8.
- (iv) Suppose there are 100 students in a school and there are 40 students taking each language, French, Latin, and German. Twenty students are taking only French, 20 only Latin, and 15 only German. In addition, 10 students are taking French and Latin. How many students are taking all three languages? No language?
- (v) Evaluate the multinomial numbers $\binom{11}{4 \ 3 \ 2 \ 0 \ 2}$ and $\binom{9}{5 \ 2 \ 2}$.

Q.3 Attempt any Four.**(20)**

- (i) Write the following permutation in cyclic form, find its inverse and write it in standard form.

$$\begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 2 & 4 & 3 & 5 & 1 \end{pmatrix}$$

- (i) If $\sigma_1 = \begin{pmatrix} 1 & 2 & 3 \\ 1 & 3 & 2 \end{pmatrix}$, $\sigma_2 = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 1 & 2 \end{pmatrix}$, $\sigma_3 = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{pmatrix}$

Find $\sigma_1 \cdot \sigma_3$ and $\sigma_1 \cdot \sigma_2$

- (ii) Find the product $(1\ 3\ 5)(2\ 3\ 4)(1\ 4)(1\ 4\ 3)$

- (iii) Find the solution to the recurrence relation

$$a_n = 4 \cdot a_{n-1} - 4 \cdot a_{n-2}, \quad n \geq 3, \quad a_1 = 1, \quad a_2 = 7$$

- (iv) Prove that, for any integer $n > 1$, exactly half of the permutations in S_n are even and half are odd.

Q.4 Attempt any Three.**(15)**

- (i) Prove that $S(n, k) = S(n-1, k-1) + k \cdot S(n-1, k)$, $2 \leq k \leq n-1$

- (ii) Show that among any seventeen points inside an equilateral triangle of side length 1, there exist two points whose distance is at most $\frac{1}{4}$.

- (iii) State and prove Pascal's identity.

- (iv) Find the number of solutions to the equation $x + y + z = 17$, where x, y and z are nonnegative integers?

- (v) Find the solution to the recurrence relation

$$a_n = 4 \cdot a_{n-1} + 5 \cdot a_{n-2}, \quad n \geq 3, \quad a_1 = 10, \quad a_2 = 20$$

- (vi) Find the inverse of $\beta \cdot \alpha$ in a standard form for $\alpha = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 1 & 4 & 2 \end{pmatrix}$ and $\beta =$

$$\begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 3 & 2 & 1 \end{pmatrix}$$

240418

5150224

Semester – II

Botany: Paper I

3 Hours

Marks: 100

- i. N.B.: All questions are compulsory
- ii. Figures to the right indicate full marks
- iii. Draw neat and labeled diagrams whenever necessary

Q.1.A. Choose the correct option from the following and rewrite the sentence 10

1. Another name for 'Pteridophytes':
a) Sporophytes b) Gametophytes c) Vascular cryptogams d) Seeded plants
2. Lateral veins in *Nephrolepis* are bifurcated at the tip to form :
a) Parallel venation b) Reticulate venation c) Bifurcated venation d) None of these
3. Hydathodes also known as:
a) Chalk glands b) Hypodermis c) Endodermis d) Stolon
4. The Thickenings in the endodermis are:
a) Sympodium b) Casparian c) Monopodium d) Sphaeraphides
5. Which zone of coralloid root of *Cycas* contains Algae and bacteria?
a) Outer cortex b) Middle cortex c) Inner cortex d) All of them.
6. Canada balsam is obtained from which of the following plants?
a) *Abies balsamea* b) "Kauri pine" c) *Pinus succinifera* d) *Pinus roxburghii*
7. The leaf may show two lateral outgrowths at its base. They are known as:
a) Leaf base b) Leaf blade c) Petiole d) Stipules
8. *Calotropis* species may show following type of leaf bases:
a) Auriculate b) Amplexicaul c) Perfoliate d) Connate
9. In monocots an outgrowth present at the junction of leaf base and lamina known as:
a) Exstipulate b) Tendril c) Ligule d) Partite
10. In all of the plants given below have Imparipinnate leaves except:
a) Rose b) *Pisum sativum* c) *Clitoria* d) *Acacia nilotica*

Q.1.B. Answer the following in one sentence.

10

1. What is the function of Hydathodes?
2. Write any one difference between transpiration and guttation.
3. Describe the function of coralloid root in *Cycas*.
4. Determine *Cycas* Microsporophyll with the help of diagram only.
5. Differentiate between Parallel and Reticulate venation with the help of diagram.

Q.2. Answer any two of the following.

20

1. With the help of neat and labelled diagrams explain Asexual reproduction in *Nephrolepis*.
2. Give a detailed account on types of protosteles with the help of suitable diagrams.
3. Elaborate fertilization in *Nephrolepis*. Draw suitable diagrams wherever necessary.
4. Explain in detail alternation of generation in *Nephrolepis*.

Q.3. Answer any two of the following.

1. Describe the T.S of coralloid root of *Cycas*.
2. Write a note on Megasporephyll of *Cycas* plant.
3. Explain in detail the Pollination, Fertilization and Formation of seed in *Cycas* plant.
4. Write a detailed note on economic importance of gymnosperms.

Q.4. Answer any two of the following.

20

1. What is Inflorescence? Explain Racemose inflorescence.
2. Assign the given plants to their respective families giving reasons and write their economic importance. (a) *Hibiscus rosa-sinensis* (b) *Pancreaticum caribaeum*.
3. Give a detailed account on the parts of lamina.
4. Define Phyllotaxy and explain spiral and opposite phyllotaxy.

Q.5. Write short notes on any four.

20

1. Antheridium of *Nephrolepis*.
2. Siphonostele.
3. Systematic position of *Cycas*.
4. Xerophytic adaptation of *Cycas* leaflet.
5. Types of leaf margin.
6. Differentiate between Hypanthodium and Verticillaster Inflorescences.

2401/19

Semester – II.

Botany: Paper II

3 Hours Marks: 100

5190224

N.B.: All questions are compulsory

Figures to the right indicate full marks

Draw neat and labeled diagrams whenever necessary

Q.1. A. Choose the correct option from the following and rewrite the sentence 10

1. _____ discovered nucleus in the skin of orchid leaves.

a) Robert Hooke b) Grew c) Robert Brown d) Hugo Von Mohl

2. A Group of cell similar in size, shape, origin, development pattern and function forms.

a) Tissue b) Tissue system c) connective tissue d) mechanical tissue

3. The chief mechanical tissue which gives strength and rigidity to the plant part is.

a) sclerenchyma. b) collenchyma c) parenchyma d) Aerenchyma

4. Which of the following tissue is absent in the monocots?.

a) Chlorenchyma b) parenchyma c) collenchyma d) sclerenchyma

5. In the process of photosynthesis oxygen is evolved from water is conformed by.

a) Robert Hill b) Arnon. c) Blackman d) Melvin Calvin

6. In the chloroplast photosynthetic pigments are present in_.

a) Thyllakoid b) Granum c) stroma d) Both a & b

7. Which of the following photosynthetic pigment is known as essential pigment for photosynthesis?

a) Chl-c. b) Chl-b c) Chl-d d) Chl-a

8. PS-II absorb the wavelength of light _____ nm.

a) 700 b) 680 c) 720 d) 640

9. Find the odd one out?

a) Anthocyanins b) Sucrose c) Amino acids d) chlorophyll

10. The botanical name of dry ginger is_____.

a) Curcuma longa b) Oscimum sanctum c) Zingiber officinale d) Santalum album

Q.1.B. Answer the following in one sentence.

10

1. Medicinal botany
2. Photophosphorylation
3. Photosynthesis.
4. Complex permanent tissue
5. Epidermal appendages.

Q.2. Answer any two of the following.

20

1. Describe the location, structure, type and function of any two simple permanent tissue.
2. Explain the process of noncyclic photophosphorylation with the help of the pathway.
3. With the help of neat labelled diagram explain the types of stomata.
4. Write the information of Aloe with active constituents and medicinal uses.

Q.3. Answer any two of the following.

20

- 1) What is metabolites? Explain the types of metabolite with examples.
2. Explain the active constituents and medicinal uses of Tulsi and Turmeric also mention the botanical name, family and source.
- 3 Distinguish between C3 and C4 plants.
4. Explain the T.S. of typical dicot leaf with the help of neat labelled diagram

Q.4. Answer any two of the following.

20

1. Explain calvin cycle
2. With the help of neat labelled diagram explain C4 pathway.
3. Explain different components of phloem with their functions.
4. Explain active constituents and medicinal properties of saunth.

Q.5. Write short notes on any four.

20

1. Sclereids.
2. Tracheids.
3. CAM pathway.
4. Structure of chloroplast.
5. Adulsa.
6. Santalum album.

240420

S240224

Time : 3 Hrs

Total Marks : 100

- N.B :
1. All questions are compulsory
 2. All questions carry equal marks
 3. Draw neat and labelled diagram wherever necessary

Q.1 A) Fill in the blanks by choosing the correct options given below.

05

- a. _____ is number of organisms per unit area.
(Crude density, ecological density, realized density)
- b. _____ population distribution supports defense, breeding , nesting ,etc.
(Clumped, random, uniform)
- c. Ticks and mites are _____.
(Endoparasite, ectoparasite, pathogenic parasite)
- d. Primary consumer is
(Tiger, bear, wolves)
- e. An animal product patent is _____.
(Neem, haldi, HCG)

Q.1B) Match the columns I and II and rewrite

05

Column I	Column II
a) Diagonal Survivorship curve	1) Kairanga National Park
b) Urn shaped pyramid	2) Kerala
c) Desert fox	3) Type II curve
d) One horned rhino	4) Narrow base
e) Coconut lagoon	5) <i>Magalotis zerda</i>

Q.1 C) State whether the given statement is true or false.

05

- a. The term population is derived from Latin term 'Populus' which means people.
- b. An ideal example of commensalism is Hermit crab and sea anemone
- c. Profundal zone has maximum penetration of light.
- d. Bitter gourd is well known for ant-diabetic properties
- e. Pirotan Island Marine Park is considered as the 'Rain forest of the corals'

Q.1 D) Define the following.

05

- a. Mortality
- b. Catadromous migration
- c. Intraspecific interactions
- d. Anti-biosis
- e. Vulnerable

- Q.2 A) Explain age structure with age pyramid and its types. 10
- OR
- A) Explain population growth pattern and its types.
- Q.2 B) Explain any two from the following. 10
- Population density
 - Fecundity
 - Life tables
 - Stair step Survivorship curve
- Q.3 A) Describe lotic ecosystem with examples. 10
- OR
- A) What are animal interactions? Describe the interspecific interactions.
- Q.3 B) Explain any two from the following. 10
- Describe the sulphur cycle in nature.
 - Classification of abiotic components
 - Grazing food chain
 - Detritus food chain with example.
- Q.4 Answer any two from the following. 20
- Explain extinct category and extinct in the wild with suitable example
 - Describe Pirotan Island Marine Park with two representative animal species
 - Describe ecotourism in India with emphasis on Rajgad – Pune
 - Explain Basmati rice, Haldi and Neem plant patents
- Q.5 Write short notes on any four. 20
- Population dispersal
 - Steps of Human census
 - Pyramid of Biomass
 - Significance of food chain and importance of food web.
 - Keoladeo Ghana National Park
 - Project tiger

240422

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Time : 3 Hrs

Total Marks :

100

- N.B :**
1. All questions are compulsory
 2. All questions carry equal marks
 3. Draw neat and labelled diagram wherever necessary

Q.1 A) Fill in the blanks by choosing the correct options given below.

05

- a. BMI is the simplest method of assessment of.....
(Starvation, flatulence, obesity)
- b. Peptic ulcer is a general term for ulcer in
(Stomach, mouth, liver)
- c. pH of consumable water should range between _____
(4.5 to 6.0 , 6.5 to 8.5 , 8.0 to 9.5)
- d. The Viral STIs include _____
(Chlamydia, HIV, Trichomoniasis)
_____ is a sleep disorder.
(Anxiety, insomnia , migraine)

Q.1B) Match the columns I and II and rewrite

05

Column I	Column II
a) Piles	1) Self control
b) Alopecia	2) Acute Flaccid Paralysis
c) Healthy individual	3) Seasonal Affective Disorder
d) Polio	4) Loss of hair
e) Depression	5) Haemorrhoids

Q.1 C) State whether the given statement is true or false.

05

- a. Rickets is caused by deficiency of vitamin A
- b. Kwashiorkor is a type of malnutrition.
- c. Water boils at 100 °C.
- d. Self medication can develop an addiction.
- e. Occupational stress can cause insomnia.

Q.1 D) Define the following.

05

- a. Aplastic anaemia
- b. PCOD
- c. Green Water foot print
- d. Coagulation
- e. Normal blood pressure range

Q.2 A) Write a note on the causes, symptoms and treatment of Anaemia. 10

OR

A) Write a detailed note on the causes, symptoms and prevention of starvation.

Q.2 B) Explain any two from the following. 10

- a. BMI and its significance
- b. Concept of balanced diet and dietary recommendation of infant.
- c. Causes of constipation
- d. Marasmus

Q.3 A) Explain WHO program to successfully eradicate smallpox in India. 10

OR

A) Write a note on large scale water purification with help of rapid sand filter.

Q.3 B) Explain any two from the following. 10

- a. Social bond
- b. Blood composition
- c. Four phased Malaria eradication program
- d. Personal hygiene

Q.4) Explain any two of the following. 20

- a. Hypertension (High Blood Pressure)
- b. Tuberculosis
- c. Asthma
- d. Oral cancer

Q.5 Write short notes on any four. 20

- a. Prevention and remedy of peptic ulcers
- b. Introduction of nutrition
- c. Cell tower radiation
- d. Safe sex precaution
- e. Anxiety
- f. HIV

240422

S280224

RIZVI COLLEGE OF ARTS, SCIENCE & COMMERCE

F.Y.B.Sc (Physics) SEM –II

A.T.K.T (OLD SYLLABUS)

Paper-II (USPH202)

Time : 3 Hrs

Marks : 100

Note : 1. All questions are compulsory.**2. Figure to the right indicates full marks.****3. Use of non-programmable calculator is allowed.****4. Symbols have their usual meanings.****Q.1 A) Attempt any TWO of the following.****(20)**

- 1) An alternating emf is applied to a resistance R and inductance L in series. What will be the impedance, the current and the phase difference between applied emf and current
- 2) Determine the current in a series LCR circuit connected to a source of an alternating emf. Hence obtain the condition for resonance.
- 3) Find the condition of balance for Maxwell's L/C bridge.
- 4) What is an A.C. bridge? Obtain the conditions required to balance an AC bridge

Q.1 B) Attempt any ONE of the following.**(05)**

- 1) Find the resonant frequency of series LCR circuit for $L = 40 \text{ mH}$, $C = 0.2 \mu\text{F}$ and $R = 10 \Omega$.
- 2) In a Wien's bridge, if $R_1 = R_2 = 10 \text{ K}\Omega$, $C_1 = C_2 = 0.22 \mu\text{F}$ and $R_4 = 1.2 \text{ K}\Omega$ Find the R_3 to balance the bridge and frequency of the ac input voltage.

Q.2 A) Attempt any TWO of the following.**(20)**

- 1) Show that NAND gates are basic building blocks with neat diagram.
- 2) State and prove De Morgan's theorem.
- 3) What is Zener diode? Explain how Zener diode can be used as voltage regulator.
- 4) Thevenin's theorem and write basic steps for solving a network using it.

Q.2 B) Attempt any ONE of the following.**(05)**

- 1) Explain Combination clipper with neat circuit diagram.
- 2) Prove the given Boolean equation $A + \bar{A}B + A \cdot B = A + B$

Q.3 A) Attempt any TWO of the following.**(20)**

- 1) State and explain Coulomb's law. Write in a vector form. Apply it to a Distribution of n –charges distributed randomly.
- 2) Derive an equation for energy stored in a continuous charge distribution.

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- 3) Obtain an expression for magnetic field due to a current carrying straight Wire at the center.
- 4) Derive an expression for magnetic field due to a long solenoid.

Q.3 B) Attempt any ONE of the following. (05)

- 1) Prove Calculate the electric field intensity on the surface of Uranium nucleus $z = 92$. It's nuclear radius is 7×10^{-15} m.
- 2) A straight long conductor carries a current of 10 A. Find the magnetic field at a distance 10cm from conductor.

Q.4 A) Attempt any FIVE of the following. (25)

- 1) Show that in single element AC circuits, the current leads emf by 90° when a Pure capacitance C in the circuit.
- 2) Find the balancing condition for D'Sauty bridge.
- 3) What is Ex – OR gate? Explain parity checker.
- 4) Describe the positive clamper with neat circuit diagram.
- 5) Show that electric intensity at a point is the negative gradient of potential at that point.
- 6) Write a short note on HELMOLTZ coil.

.....

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RIZVI COLLEGE OF ARTS, SCIENCE & COMMERCE
F.Y.B.Sc. (PHYSICS) SEM - II (REGULAR & ATKT)
PAPER – II (USPH202)

Time : 2.30 hrs.

Marks : 75 M

INSTRUCTIONS:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Use of simple non-programmable calculator is allowed.
4. Draw a diagram wherever necessary.

Q. 1 Attempt any TWO of the following. (20)

1. An alternating emf $E = E_0 \sin \omega t$ is applied to a resistance R and inductance L in series. Calculate the current, impedance and phase difference between applied emf and current. Also draw proper wave form and phaser diagram.
2. An alternating emf $E = E_0 e^{j\omega t}$ is applied to a series L-C-R circuit. Show that the current in the circuit is $I = I_0 e^{j(\omega t - \phi)}$ Hence obtain the value of I_0 , impedance Z and phase angle ϕ .
3. Draw the resonance curve and derive an expression for the band-width in series LCR resonant circuit. Hence obtain Q-factor.
4. What is general A.C. bridge? Obtain the conditions required to balance an A.C. bridge.

Q. 2. Attempt any TWO of the following. (20)

1. Explain with neat diagram the working of bridge type full wave rectifier.
2. What is Zener diode? Explain how Zener diode can be used as voltage regulator.
3. State Thevenin's theorem and write basic steps for solving a network using it.
4. State and prove maximum power transfer theorem.

Q. 3 Attempt any TWO of the following. (20)

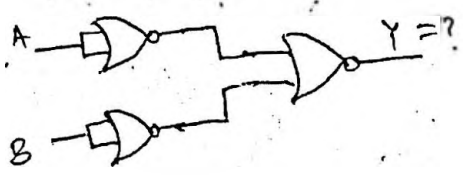
1. Define universal gates. Using NOR gate construct other basic gates with their truth table.
2. Explain half adder and full adder with their truth table.
3. State and prove De-Morgan's theorem using basic gates also tabulate its truth table.
4. Convert the following:-

i) $(25.65)_{10} = (?)_2$	ii) $(101110.0100)_2 = (?)_{10}$
iii) $(8BC)_{16} = (?)_{10}$	iv) $(125.512)_{10} = (?)_{16}$

Q. 4 Attempt any THREE of the following. (15)

1. Find the resonant frequency of series LCR circuit for $L = 20 \text{ mH}$, $C = 0.1 \mu\text{F}$ and $R = 20 \Omega$.

2. In a Wien's bridge if $R_1 = R_2 = 1k\Omega$, $C_1 = C_2 = 0.22\mu F$ and $R_4 = 2.2k\Omega$. Find the value of R_3 to balance the bridge and the frequency of the A.C. input voltage.
3. Describe in brief the action of CLC or π filter
4. Explain in brief combination clipper.
5. If $Y = (A + \bar{B})\bar{C}$, design the circuit diagram using basic gates.
6. Obtain the logic output Y from the following circuit diagram (redraw the circuit diagram and show the output of each gate)



*****THE END *****

S220224

RIZVI COLLEGE OF ARTS, SCIENCE & COMMERCE
F.Y.B.Sc. (PHYSICS) SEM II (Regular + ATKT)
PAPER – I (USPH201)

Time : 2.30 hrs.

Marks : 75 M

INSTRUCTIONS:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Use of simple non-programmable calculator is allowed.
4. Draw a diagram wherever necessary.

Q. 1 Attempt any **TWO** of the following. (20)

1. Derive an expression for the position of the equivalent lens for a system having two thin lenses separated by a finite distance.
2. Explain principal foci and focal planes for a lens system of thick lenses with neat diagram.
3. Prove that in the case of thin convex lens; $\frac{1}{f} = (\mu - 1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$; where symbols have usual meaning.
4. Write the terminology of lens and sign convention associated with lenses.

Q. 2. Attempt any **TWO** of the following. (20)

1. With the help of a neat ray diagram explain the construction and working of a Ramsden's eyepiece.
2. What is a simple microscope? Show that $M = 1 + D/f$
3. Give the necessary theory of a Newton's rings to prove that the radius of a dark Ring is proportional to the square root of a natural number.
4. Explain the formation of a bright colour of thin films in reflected system.

Q. 3 Attempt any **TWO** of the following. (20)

1. What is gas LASER? Explain the working of He-Ne LASER with relevant diagram.
2. Explain the following LASER beam Characteristics in detail; (a) Mono-chromaticity and (b) Coherence.
3. Explain total internal reflection and Light propagation through optical fibre. Draw necessary diagram wherever required.
4. Explain with diagram the step index and graded index optical fibre.

Q. 4. Attempt any **FIVE** of the following. (25)

1. Determine the focal length of the lens with refractive index 2 and radius of curvature of two surfaces respectively 20 cm and - 35 cm.
2. The focal length of a convex lens is 25 cm. the object distance is 20 cm. what is the image distance?
3. Explain the terms (a) Lateral magnification (b) Longitudinal magnification and (c) Angular magnification.
4. Two thin plano-convex lenses of same R.I. forms a Huygen's eyepiece. Their Focal lengths are 6 cm and 2 cm. What is the equivalent focal length of eyepiece.
5. A glass-wedge with the angle of wedge of 30 seconds of an arc is formed with a Liquid of R.I 1.47. Find the number of dark fringes/cm. of the wedge length.
6. Write a note on Newton's telescope.
7. Calculate the N.A. of a fibre with core index $n_1 = 1.61$ and cladding index $n_2 = 1.55$.
8. Explain how optical fibre is used in the medical procedure carried out using endoscope.
9. Draw an energy level diagram for Ruby LASER.

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RIZVI COLLEGE OF ARTS, SCIENCE AND COMMERCE
F.Y.B.SC CHOICE BASED (ATKT 2023-24) SEMESTER II CHEMISTRY: PAPER I

(Time: 3 hours)

Total Marks: 100

N.B.: (1) All questions are compulsory.

(2) Figures to the right indicate full marks.

(3) Use of log table/ non-programmable calculator is allowed.

Q1 A Attempt any 10 out of 15

15M

1 The compressibility factor i.e. deviation of real gases from ideal behaviour is given by

a) $Z = PV/RT^2$

b) $z = PV/2RT$

c) $z = PV/RT$

2 For one mole of a gas the ideal gas equation is _____.

a) $PV = RT$

b) $PV = 1/2RT$

c) $PV = 3/2RT$

3 $Ag_{(s)} | AgCl_{(s)} | Cl^{-}(aq)$ is electrode

a) Redox

b) Metal-insoluble salt

c) Amalgam

4 The reaction $2SO_3(g) \rightleftharpoons 2SO_2(g) + O_2(g)$ is _____.

a) Reversible reaction

b) Irreversible reaction

c) Chain reaction

5 The value of equilibrium constant depends on _____.

a) Path function

b) State function

c) Constitutive property

6 The colour of bromine gas is _____.

a) yellow

b) violet

c) brown

7 If a glowing splinter makes pop sound, then the gas is _____.

a) oxygen

b) hydrogen

c) carbon dioxide

8 Hydrated salts on heating gives _____ gas.

a) H_2O gas

b) carbon dioxide

c) hydrogen

9 According to Arrhenius theory, a substance that produces OH^{-} ions in water is _____ species.

a) acidic

b) basic

c) neutral

10 _____ is soft base

a) Cl^{-} b) Br^{-} c) I^{-} 11 In E_1 mechanism 1 stands for _____ molecular.

a) bi

b) tri

c) uni

12 Ozonolysis is carried out with.

a) alkane

b) alkyne

c) alkene

13 Alkyl halide are coupled with sodium metal is known as _____ coupling reaction.

a) wurtz fitting

b) wurtz

c) hofmman

14 Alkanes undergo _____ reaction.

a) Elimination

b) addition

c) Substitution

RIZVI COLLEGE OF ARTS, SCIENCE AND COMMERCE
F.Y.B.SC CHOICE BASED (ATKT 2023-24) SEMESTER II CHEMISTRY: PAPER I

15 If two atoms or a groups are lost from the adjacent carbon atom it is called
Elimination reaction

a) α

b) β

c) γ

Q1 B Match the following (any 5)

05M

- | | |
|--|------------------------|
| 1 Cd(Hg) Cd+2 | a) cis hydrogenation |
| 2 For one mole of gas K.E. | b) Arrhenius acid |
| 3 Pt, H ₂ (g) (1 atm) H ⁺ (1M) | c) Lewis base |
| 4 H ⁺ acceptor | d) Amalgam electrode |
| 5 H ⁺ donor | e) trans hydrogenation |
| 6 Lindlar catalyst | f) $E = 3/2 RT$ |
| 7 Birch reduction | g) Gas electrode |

Q1 C True or False (any 5)

05M

- The actual volume occupied by the gas molecule is negligible as compared to the total volume occupied by the gas.
- Entropy is a path function.
- Ions with negative charge are called cations.
- A buffer mixture is used to maintain pH constant.
- RhCl (PPh₃)₃ is known as Wilkinson's catalyst.
- Diels alder reaction is a type of free radical reaction.
- Primary alkyl halide follows E₂ mechanism

Q2 Attempt any 4

20M

- Calculate the volume of 10 moles of a gas at 1.013 × 10⁷ Nm⁻² pressure and 273K, if its compressibility factor is 0.783.
- What is meant by ideal gas and real gas? Explain with suitable examples.
- If the resistance of the cell is 100 ohms, the length and area of the cell is 0.8 cm & 0.7628 cm². Calculate kappa (k) for this cell. What is kappa?
- Explain the difference between electrochemical or galvanic cell and electrolytic cell with suitable examples.
- What are reversible and irreversible reactions? Explain with examples.
- Why was second law of thermodynamics needed? State second law of thermodynamics in different ways.

Q3 Attempt any 4

20M

- How will you detect the gases evolved?
 i) CO₂ ii) Cl₂ iii) SO₂ iv) HNO₃ v) NH₃
- i) What are reagent papers? How are they more advantageous over liquid or solid reagents?
 ii) How will you detect a) S²⁻ and b) Cl⁻ using reagent paper?
- What is common ions effect? Explain the precipitation of chlorides of Ag.
- Discuss Lowry Bronsted Concept and its application with suitable examples.
- Discuss any 2 applications of HSAB concept in detail.
- What do you mean by autoionisation? Discuss autoionisation of
 i) H₂O ii) NH₃

Q4 Attempt any 4

20M

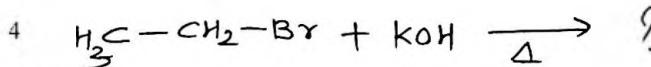
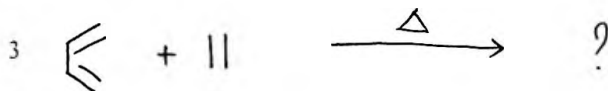
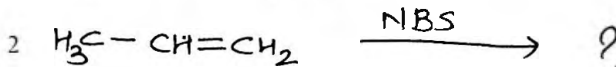
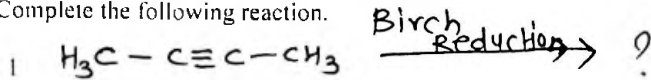
- Explain oxymercuration – demercuration reaction in alkene with one example.
- Explain 1,2 – addition and 1,4- addition reaction with suitable example.
- Discuss ozonolysis of alkene with mechanism of ozonide formation.

- D Explain the mechanism of E_1 reaction giving energy profile diagram.
 E Explain Wurtz and Wurtz fitting reaction with suitable example.
 F What is halogenation? Give the mechanism of chlorination of methane.

Q5 Attempt any 4

20M

- A Define and explain the Law of Mass action.
 B What is the critical temperature of a gas whose critical pressure and critical volume are 100 atm and $68 \text{ cm}^3 \text{ mol}^{-1}$ respectively? [$R = 8.314 \text{ Nm K}^{-1} \text{ mol}^{-1}$].
 C Differentiate between Class 'a' and Class 'b' metals
 D Differentiate between soft bases and hard bases.
 E Complete the following reaction.



- F What is markownikoff rule? Give two examples.