VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST
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[Affiliated to Madurai Kamaraj University]

B.Sc. Botany & Zoology Degree (Semester) Examinations, April 2020
Part – III : Allied Subject : Second Semester : Paper – I

CHEMISTRY FOR BIOLOGIST–II
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. A species that can act either as an acid or a base is called
   a) Neutral b) Amphoteric c) Complex d) Conjugate acid
2. Phenolphthalein in acidic solution is
   a) colorless b) pink colour c) yellow colour d) orange color
3. As compared to ionic compounds, covalent bond has
   a) high melting but low boiling point
   b) low melting and high boiling point
   c) low melting and boiling point
   d) high melting and boiling point
4. Conductance of electricity in metallic bonding is due to
   a) protons b) lattice c) delocalized electrons d) nucleus
5. Which one of the following reaction can be used for the synthesis of α-amino acids?
   a) Gabriel phthalimide b) Erlenmeyer azlactone
   c) Strecker synthesis d) all of these

6. Ascorbic acid is the chemical name of vitamin

a) A b) B c) C d) D

7. The potential of a pesticide for causing damage to plant is its:

a) lethal dose b) defoliation ability

c) phytotoxicity d) chronicity

8. Two types of fungicides are:

a) contact and systemic b) systemic and natural

c) natural and contact d) none of the above

9. Most dangerous metal pollutant of automobile exhaust is

a) lead b) arsenic c) mercury d) cadmium

10. The major chemical in fertilizer that pollutes soil is:

a) nitates, sulphates b)sulphates,phosphates

c) nitrates,phosphates d) none of the above

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Define P^H.
12. Write any four characteristics of ionic compounds.
13. State Fajan's rule.
14. What do you mean by Zwitter ion?
15. Give any four characteristics of pesticides.
16. What do you mean by polar cavalent bond?
17. Define Soil pollution.

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a). Give brief note on Usanovich concept of acids and bases.

[OR]

b). Explain Arrhenius concept of acid and base.

19. a). Briefly explain Metallic bond.

[OR]

b). Explain intermolecular and intra molecular hydrogen bonding with one example for each.

20. a). How amino acids are prepared by Gabriel Phthalimide and strecker synthesis?

[OR]

b). Write a note on the classification of proteins.

21. a). Explain how the pesticides can be handled safely?

[OR]

b). What are fungicides? Write a note on the role of mercury compounds as fungicides.

22. a). Explain in detail about water treatment.

[OR]

b). Write a note on P^H of soil.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. State and explain Lowry-Bronsted theory and Lewis theory of acids and bases.

24. a). What is meant by an ionic bond? What are the conditions necessary for the formation of an ionic bond?

    b). Define Lattice energy. Describe the factors on which it depends.

25. How the vitamins are classified? Give the biological functions of any five vitamins.

26. Explain how pesticides affect the environment?

27. Discuss the causes, of water pollution .

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B.Sc. Physics Degree (Semester) Examinations, April 2020
Part – III : Allied Subject : Second Semester : Paper – I

CHEMISTRY FOR PHYSICIST-II
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. The horizontal rows in a periodic table are called
   a) Lanthanides b) Groups
   c) Periods d) Atomic Structures
2. When we move from left to right across a period, the electron affinity in general
   a) Remains the same b) Decreases
   c) Increases d) Becomes zero
3. Which of the following statements about the photochemical reactions is true?
   a) The presence of light is the primary requirement for reactions to take place
   b) Temperature has a very little effect on the rate of photochemical reactions
   c) ΔG for photochemical spontaneous reactions may +ve or –ve
   d) All of the above

4. The glow of fireflies is due to the aerial oxidation of luciferin. It is an example of

a) Fluorescence b) Phosphorescence

c) Bioluminescence d) Chemiluminescence

5. The amorphous solid among the following is

a) Table salt b) Diamond c) Plastic d) Graphite

6. A crystal plane has intercepts of 3, 4 and 2 units with x, y and z axes respectively. The Miller Indices are

a) (4,2,6) b) (3,4,6) c) (4,3,3) d) (4,3,6)

7. One Faraday is ……..coulombs.

a) 95000 b) 95500 c) 96000 d) 96500

8. According to Arrhenius theory an electrolyte when dissolved in water gives two types of

a) charged particles b) molecules

c) ion pairs d) fundamental particles

9. Given the data at 25°C,

$Ag + I^- \rightarrow AgI + e^-$; $E^o = 0.152$ V

$Ag \rightarrow Ag^+ + e^-$; $E^o = -0.800$ V

What is the value of log K_{sp} for AgI?

a) −8.12 b) 8.612 c) −37.83 d) −16.13

10. The energy of a secondary cell is usually renewed

a) By passing a current through it b) it cannot be renewed at all

c) by nenewing its chemicals d) by heating it

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. What is ionisation potential?

12. Draw simple cubic and bcc structure.

13. What do you mean by photochemical reactions?

14. Define allotropy and Polymorphism.

15. Differentiate amorphous and crystalline solid.

16. State Kohlrausch's law.

17. What are strong and weak electrolytes?

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a). Account on i) Photosynthesis ii) Quantum efficiency .

[OR]

b). Write the names and symbols of elements with atomic number 1 to 10.

19. a). State and explain laws of photochemistry.

[OR]

b). Differentiate between photochemical & thermal reactions.

20. a). Discuss on seven crystal systems with example.

[OR]

b). Derive Bragg's equation.

21. a). Explain Faraday's laws of electrolysis.

[OR]

b). Write a note on Ostwald's dilution law.

22. a). Derive Nernst equation for EMF of cells.

[OR]

b). Give the schematic representation of Calomelelectrode and explain its construction.

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SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Discuss the following:

    i) chemiluminescence ii) Bioluminescence

24. Draw Jablonski diagram and explain the consequences of light absorption by atoms and molecules.
25. Discuss on the laws of crystallography.
26. Explain the Arrhenius theory of electrolytic dissociation.
27. Illustrate the following :

    i) Specific conductance ii) Equivalent conductance.

    ii) Molal conductance

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B.Sc. Chemistry Degree (Semester) Examinations, April 2020
Part – III : Core Subject : Second Semester : Paper – I

GENERAL CHEMISTRY-III
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. 104.5° is the bond angle present in
   a) H_2O b) NH_3 c) CH_4 d) $BeCl_2$
2. o-hydroxybenzaldehyde is a liquid at room temperature while p-hydroxybenzaldehyde is a high melting solid because of
   a) hydrogen bonding b) ionisation energy
   c) lattice energy d) electron gain enthalpy
3. Benzene reacts with chlorine in presence of sunlight produces
   a) chlorobenzene b) benzenehexachloride
   c) 1,2-dichlorobenzene d) 1,3,5-tricholorobenzene
4. Anthracene undergoes electrophilic substitution reactions mainly at
   a) C-1 b) C-2 c) C-9 d) C-1 and C-2
5. Ethane thiol reacts with $KMnO_4$ or conc, HNO_3 gives
   a) ethylmercaptan b)methylmercaptan
   c) sulphuric acid d) ethanesulfonic acid
6. Sodium phenoxide reacts with CO_2 at 125 ^{0}C under 5 atm pressure to give salicyclic acid. This reaction is called

a) Kolbe's reaction b) Perkin reaction

c) Wurtz reaction d) HVZ reaction

7. The Henry's law gives the relationship between

a) the pressure and solubility of a gas in a particular solvent

b) the temperatureand solubility of a gas in a particular solvent

c) the composition of the mixture and solubility of a gas in a particular solvent

d) all of the above

8. If n represents the number of moles of a solute and N represents the number of moles of a solvent, the mole fraction of the solvent is given by

a) n / n + N b) N / n + N c) n+N / n d) n+N / N

9. Abnormal molecular masses are obtained when there exists

a) dissociation of molecules b) association of molecules

c) either of the two d) none of these

10. The ration between the effective concentration and the actual concentration of the molecule or ions in a solution is called

a) van't Hoff factor b) colligative property

c) active concentration d) activity coefficient

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Define lattice energy.
12. Differentiate: Sigma - bonding and pi - bonding.
13. Complete: Phenol + Br_2 water→
14. What is an ideal solution?
15. Write the preparation of nitroglycerin.
16. State Raoults law.
17. What is meant by FaJan's rule?

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) . Account for the Diamagnetic nature of nitrogen molecule using molecular orbital theory.

[OR]

b). Explain Born Haber cycle with suitable example.

19. a). Discuss the mechanism of sulphonation of benzene.

[OR]

b). Describe the preparation of naphthalene by Haworth synthesis.

20. a). How will you distinguish the primary, secondary and tertiary alcohol by Lucas method?

[OR]

b). Account an victor Meyer's test.

21. a). Write short note on nicotine-water system.

[OR]

b). Calculate the Normality of a solution containing 6.3g of oxalic acid crystals(Mw=126) dissolved in 500 ml of the solution.

22. a). How will you prepare: i) Resorcinol ii) Catechol.

[OR]

b). Discuss sp^3 and sp^2 Hybridisation.

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SECTION – D

Answer any THREE Questions : (3 × 10 = 30)

23. a). Explain inter and intra molecular hydrogen bonding . **(5)**

b). Using VSEPR theory, predict the shape of SF_6 and NH_3. **(5)**

24. How does naphthalene react with **(5X2=10)**

i) $CH_3CH_2Cl/AlCl_3$ ii) HNO_3/H_2SO_4

iii) CrO_3/CH_3COOH iv) $Na/C_5H_{11}O4$ v) $H_2SO_4/60^oC$.

25. a). Discuss: **(4+3+3)**

i) Reimer-Tiemann Reaction ii) Kolbe-schmidt reaction.

iii) Phthalein reaction

26. i) What are non ideal solution? ii) What is normality?

iii) What is meant by mole fraction ? iv) State Henry's law.

v) Define molarlity. **(5x2=10)**

27. Discuss the following: **(4+3+3)**

a) s - s over lapping

b) s - p over lapping

c) p - p over lapping

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B.Sc. Chemistry Degree (Semester) Examinations, April 2020
Part – III : Core Subject : Second Semester : Paper – II

GENERAL CHEMISTRY-IV
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. The nucleus of radioactive element possesses
   a) zero binding energy b) high potential energy
   c) high binding energy d) low binding energy
2. Emission is caused by the transformation of one neutron into a proton. This results in the formation of a new element having
   a) lower nuclear charge b) same nuclear charge
   c) nuclear charge lower by one unit d) nuclear charge higher by one unit
3. Ethers are insoluble in water due to
   a) intermolecular H-bonding b) intramolecular H-bonding
   c) absence of H-bonding d) low density
4. Cyclic ethers with three-membered ring are called
   a) Lactones b) Oxiranes c) Alkoxides d) Epoxy resins
5. Tetraethyl lead (TEL) is a _____
   a) anti-knock agent b) it raises octane number of petrol
   c) organometallic reagent d) all of these

6. Hydrocarbon can be prepared from when Grignard reagent reacts with _____

a) water b) ether c) thioalcohols d) all the above

7. The reaction which are caused by heat and in absence of light are called

a) catalytic reaction b) chemical reaction

c) photochemical reaction d) thermal reaction

8. "It is only the absorbed light radiations that are effective in producing a chemical reaction." This is the statement of

a) Lambert law b) Lambert-Beer law

c) Grothus-Draper law d) Stark-Einstein law

9. Reaction rates increase with temperature because as the temperature increases:

a) the activation energy decreases b) the activation energy increases

c) the rate constant increases d) the equilibrium constant increases

10. In a second order reaction A – B, if the concentration of A is doubled, the half-life of reaction will be

a) unchanged b) doubled c) halved d) quadrupled

SECTION – B

Answer any FIVE Questions : (5 × 2 = 10)

11. Define packing fraction.
12. How is tetraethyl lead prepared ? Give its use
13. How organolithium reagent is syntheized.
14. How will you synthesis acetic acid from methyl lithium?
15. State Beer-Lambert's law.
16. What is meant by quantum yield?
17. Bring out the difference between order and molecularity of the reactions.

SECTION – C

Answer ALL Questions : (5 × 5 = 25)

18. a) . Give a brief account of nuclear stability in terms of n/p ratio.

[OR]

b). Explain in detail about the Nuclear Fission.

19. a). Describe the preparation and properties of mustard gas.

[OR]

b). Write down the physical properties of ether & ester

20. a). Describe the preparation and synthetic uses of Gilman's reagent.

[OR]

b). Write the preparation of organo lithium compound and reactions with aldehyde ,ketone and acetyl chloride

21. a). Distinguish between thermal and photo chemical reaction.

[OR]

b). State Grothus - Draper law and stark - Einstein law

22. a). Derive an expression for the rate constant of a second order reaction .

[OR]

b). Write a note on collision theory.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Write notes on the muclear reactors.

24. a) Write down the Preparation properties of Mustard gas. **(5)**

    b) Write briefly on acid and base catalyzed ring opening of unsymmetrical ether. **(5)**

25. How is a Grignard reagent prepared? Describe the any five uses of the reagent for the preparation of different types of organic compound?

26. Give an account on Jablonski diagram.

27. Derive rate constant and half life period for first order reaction.

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B.Sc. Chemistry Degree (Semester) Examinations, April 2020
Part – III : Core Subject : Fourth Semester : Paper – I

INORGANIC CHEMISTRY-I
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Diboranes reacts with water to give_____.
   a) Boric acid b) Metaborates c) Borazole d) Borazine
2. Thortveitite is an example of _____silicate.
   a) Pyro b) Chain c) Phyllo d) Ortho
3. The structure of N_2O is
   a) Linear b) non-linear c) V shape d) partially non -linear
4. Concentrated Sulfuric acid is act as a very good_____.
   a) Oxidising agent b) dehydrating agent
   c) both a & b d) Reducing agent
5. The shape of IF_5 is_____.
   a) Square pyramidal b) Octahedral
   c) Square planar d) Pentagonal bipyramidal
6. The shape of XeF_4 is_____.
   a) Square pyramidal b) Distorted octahedral
   c) Square planar d) T-shape

7. Colour in transition metal compounds is attributed to

   a) Small size metal ions b) Absorption of light in UV region

   c) Complete (ns) subshell d) Incomplete (n−1) d subshell

8. In addition to uranium, which other actinide occurs naturally in significant amounts?

   a) Actinium b) Plutonium c) Protactinium d) Thorium

9. When Bauxite ore is calcinated, it yield

   a) Silica b) Alumina c) both a & b d) Calcium oxide

10. The gas liberated in Van Arkel –De-Boer process is

    a) Iodine b) Bromine c) Chlorine d) Fluorine

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Draw the structure of graphite.

12. What are the uses of silicon carbides?

13. How will you prepare ammonia?

14. Mention the Structure of Hydrazine.

15. What are Pseudohalogens? Give two examples.

16. Draw the structure of IF_7.

17. What is ment by reduction by thermal decomposition.

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) Explain the structure of Diborane.

[OR]

b) Predict the hybridization, geometry of shape of:

i) XeF_2 ii) XeF_6 iii) $XeoF_2$ iv) XeO_3

19. a) Write down the preparation & properties of hydraznie .

[OR]

b) Explain the froth flotation & leaching method.

20. a) List out the anomalous behaviour of Fluorine.

[OR]

b) Write the preparation and properties of IF_5

21. a) Write note on: i) Roasting Method

[OR]

b) Give the causes and consequences of lanthanide contraction

22. a) Explain the Froth Floatation method with diagram.

[OR]

b) Write down the synthesis of: i) N_2O ii) HNO_3 iii) o-H_3PO_4

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Give an account on Classification and structure of silicates.

24. Explain the different behavior of N_2 from rest of the elements.

25. Explain the separation of Individual gases form inert gas mixture by Dewar's method.

26. Discuss the preparation properties & bonding of diborane.

27. Write down the preparation, properties & uses of ozone.

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B.Sc. Chemistry Degree (Semester) Examinations, April 2020
Part – III : Core Subject : Fourth Semester : Paper – II

PHYSICAL CHEMISTRY-II
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Which of the following is a crystalline solid?

   a) Copper wire b) Glass bottle c) Polythene bag d) Rubber ball

2. Which of the following unit cells do not exist for tetragonal lattices?

   a) Primitive centered unit cell b) Body centered unit cell

   c) Face centered unit cell d) All of the mentioned exist

3. If indium is added as impurity to germanium, the type of semiconductor obtained is called _____.

   a) p-type b) n-type c) intrinsic d) none of the above

4. Pure substances which show conductivity similar to Si and Ge are called _____ semiconductors

   a) intrinsic b) extrinsic c) n-type d) p-type

5. Which one of the following exhibit both smectic and nematic characters

   a) p-Azoxyanisole b) Diethyl benzidine

   c) Chloesteryl benzoate d) p-methoxycinnamic acid

6. Rock salts can adopt _____coordination number

a) 5 b) 6 c) 8 d) 4

7. The ideal gas equation is:

a) PV=RT b) PR=VT c) PR=nVT d) PV=nRT

8. Mean free path is denoted by

a) λ b) π c) m d) p

9. The van der Waals equation for a real gas is

a) $(P+n^2a/V^2)(V-nb)=nRT$ b) $(P+n^2b/V^2)(V-na)=nRT$

c) $(P-n^2a/V^2)(V-nb)=nRT$ d) $(P-n^2b/V^2)(V-na)=nRT$

10. The temperature at which second virial coefficient vanishes and subsequent coefficient become insignificant is known as

a) absolute temperature b) craft temperature

c) boyle's temperature d) critical temperature

SECTION – B

Answer any FIVE Questions : (5 × 2 = 10)

11. Define polymorphism.

12. What are semiconductors?

13. Write the Born-Lande equation and explain the terms in it.

14. State Graham's law of diffusion.

15. List out various intermolecular forces.

16. Define allotrophy.

17. What are Miller indices?

SECTION – C

Answer ALL Questions : (5 × 5 = 25)

18. a) . Explain about crystalline and amorphous crystalline solids.

[OR]

b). Discuss on the packing efficiency of Simple cubic crystal systems.

19. a). Derive Bragg's equation.

[OR]

b). Discuss on the band theory of solids.

20. a). Explain the radius rati rule with an example/

[OR]

b). Describe types of crystal.

21. a). Derive kinetic Gas equation..

[OR]

b). Explain the three types of velocities.

22. a). Discuss the deviation of real gases from ideal behaviour write reference to compressibility factor Z

[OR]

b). Write the formula of following equations (explain the terms involved).

i) Dieterici ii) Berthelot iii) Clausius iv) Redlick-Kwong.

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SECTION – D

Answer any THREE Questions : (3 × 10 = 30)

23. Explain in detail the different types of cubic systems with examples for each.
24. What do you mean by imperfection in crystals? Describe different types of imperfectional defects in crystals.
25. How are liquid crystals classified? Describe any three types with an example for each.
26. Explain the various Collision parameters.
27. Explain: i) dipole - dipole interaction.
    ii) dipole - induced dipole interaction.

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B.Sc. Chemistry Degree (Semester) Examinations, April 2020
Part – III : Core Subject : Sixth Semester : Paper – I

ORGANIC CHEMISTRY-III
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. The advantage of using conducting polymers in place metals is there
   a) Cost b) Light-weight
   c) Thermal conductivity d) Solubility
2. Which is not a polymer?
   a) sucrose b) enzyme c) starch d) Teflon
3. Which of the following groups is an auxochrome?
   a)-NO_2 b)-NO c)-OH d)-N=N-
4. Claisen reaction gives_____migration leads to form product
   a) allylic b) vinylic c) geminal d) both a & b
5. On reduction of thiophene with Na-Hg, C_2H_5OH produces
   a) 2,3-Dihydrothiophene b) Tetrahydrothiophene
   c) 3,4-Dihydrothiophene d) Furoic acid
6. The molecular formula of coniine is
   a) $C_9H_{16}N$ b) $C_8H_{17}N$ c) $C_8H_{19}N$ d) $C_9H_{17}N$

7. Oxidation of menthol gives

a) Menthone b) Menthal c) Methol 2-ene d) Geranial

8. Bacteriostatic nature of sulpha drugs is due the structure similarity of

a) p-aminobenzoic acid b) o-aminobenzoic acid

c) m-aminobenzoic acid d) ipso- aminobenzoic acid

9. The base value of homoannular diene for calculating λ_{max} is

a) 217 nm b) 214 nm c) 253 nm d) 243 nm

10. Which one of the following nuclei is **NOT** inactive in NMR?

a) ^{1}H b) ^{19}F c) ^{16}O d) ^{31}P

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. What are conducting polymers? Give examples.

12. Differentiate between addition and condensation polymerization.

13. Define the term Chromophore with suitable examples.

14. Why is pyrrole weaker base than pyridine?

15. Write a note on: Riemer-Tiemann Formylation of Indole.

16. Give the applications of the Sulpha drug.

17. What is Chemical shift?

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) . Discuss the mechanism of free radical polymerization with suitable example.

[OR]

b). Explain the applications of Biomedical polymers.

19. a). How are dyes classified on the basis of structure?

[OR]

b). Give the preparations and uses of malachite green.

20. a). Explain the following: i) Kolbe-Schmit Carboxylation Reaction.

ii) Preparation of Thiopene from n-butane

iii) Friedel- Crafts Acylation of Furan.

[OR]

b). Discuss the preparation and properties of pyridine?

21. a). Write the biological importance of the following

i) Ascorbic acid ii) Progesterone

[OR]

b). How would you prepare the sulphanilamide and sulphathiazole?

22. a). Write a note on: Finger print region of IR spectroscopy.

[OR]

b). Write various shift involved in UV - Visible spectroscopy.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Discuss the preparation of the following Polymers.

i) Nylon 66 ii) Epoxide Resin

iii) Neoprene Rubber iv) Styrene- Butadiene Rubber

24. Explain the detailed mechanism of the following rearrangements.

i) Wagner –Meerwin rearrangement ii) Fries rearrangement

25. i) Give the preparation and properties of quinoline.

ii) Write a note on Fischer indole Synthesis.

26. How is citral synthesised? Discuss the chemical properties of geraniol.

27. Discuss any two applications of NMR spectroscopy with illustration.

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B.Sc. Chemistry Degree (Semester) Examinations, April 2020
Part – III : Core Subject : Sixth Semester : Paper – II

PHYSICAL CHEMISTRY-IV
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. It takes 42.0 min for the concentration of a reactant in a first-order reaction to drop from0.45 M to 0.32 M at 25°C. How long will it take for the reaction to be 90% complete?
   a) 13.0 min b) 86.0 min c) 137 min d) 284 min
2. If the order of reaction is zero. It means that
   a) Rate of reaction is independent of temperature
   b) Rate of reaction is independent of the concentration of the reacting species
   c) The rate of formation of activated complex is zero
   d) The rate of decomposition of activated complex is zero
3. The point group D_{2h} does not contain
   a) Two-fold axis b) Horizontal plane
   c) Vertical plane d) S4 axis
4. The symmetry number is 6 for
   a)BF_3 b)XeF_4 c)CO_2 d)SF_6
5. Which of the following types of waves has the shortest wavelength?
   a) UV rays b) Microwaves c) Radio waves d) X-ray

6. A photon of wavenumber 100 cm^1 has a wavelength of
   a) 1 m b)1 mm c)1000nm d)100 m
7. The wavenumber of a transition is 2000 cm^{-1}. In what part of the electromagnetic spectrum does this come?
   a) Microwave b) Ultraviolet-visible
   c) Infrared d) Radiowave
8. If the reduced mass of a diatomic molecule is doubled without changing its force constant, the vibrational frequency of the molecule will be
   a) twice the original frequency
   b) unchanged
   c) $\sqrt{2}$ times the original frequency
   d) $1/\sqrt{2}$ timesthe original frequency
9. Select the incorrect statement from the following option.
   a) TMS stands for tetra methyl silane
   b) All the hydrogen in TMS have the same chemical shift
   c) TMS has a high boiling point, so it is not easily lost when holding the NMR sample
   d) TMS is relatively unreactive with most functional groups
10. In the mass spectrum of the molecule phenol, C_6H_5OH, the approximate intensity of the peak at *m/z* 95, relative to the molecular ion at 94 will be which of the following?
   a) 94% b) 6.6 % c) 10.0 % d) 7.0 %

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. What is meant by the term "Order" of a reaction?
12. Define point group.
13. Distinguish between absorption and emission spectra.
14. What is a band spectrum?
15. Define zero point energy?
16. Why are the reactions of higher order rate?
17. What are stokes and antistokes lines?

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a). Write the difference between order and molecularity.

[OR]

b). Calculate the activation energy of a reaction whose reaction rate at 27^oc gets doubled for 10^oc rise in temperature.

19. a). Explain in detail the different symmetry operations.

[OR]

b). Derive the group multiplication table for C_2V point group.

20. a). Mention the types of molecular spectra. Explain any two types in detail.

[OR]

b). The pure rotational spectrum of gaseous HCl consists of a series

of equally spaced lines separated by 20.80 cm^{-1}. Calculate the inter nuclear distance of the molecule.

The atomic masses are:H-1.673 X 10^{-27} kg; Cl= 58.06 X 10^{-27} kg.

21. a). Discuss the vibrational spectra of diatomic molecules.

[OR]

b). Compare IR and Raman spectra.

22. a). Write the difference between Transitions and Collision theory.

[OR]

b). Illustrate the digramatically that H_2O molecule is abelian where as NH_3 molecule is nonabelian.

SECTION – D

Answer any THREE Questions : (3 × 10 = 30)

23. Enumerate the collision theory of Unirnolecuar reaction.

24. Illustrate the types of syonmetry elements.

25. State the principle of microwave spectroscopy. Discuss briefly the rotational spectra of rigid diatomic molecules.

26. Explain the rotational vibrational spectra of diatomic spectra.

27. Derive an expression for the first order rate constant and half - life period of a reaction.

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B.Sc. Chemistry Degree (Semester) Examinations, April 2020
Part – III : Elective Subject : Sixth Semester : Paper – II

NANO CHEMISTRY
Under CBCS – Credit 5

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Degree of scattering in transmission electron microscope is a function of _____

   a) Wavelength of electron beam used

   b) Number of atoms that lie in the electron path

   c) Number and mass of atoms that lie in the electron path

   d) Mass of atoms that lie in the electron path

2. Photograph which is taken from microscope is known as

   a) Macrograph b) Monograph c) Micrograph d) Pictograph

3. Which nanometerial is two dimentional?

   a) Colloids b) Metal oxides c) Nanotubes d) Nanoparticles

4. If the absorption of electromagnetic radiation by matter results in the emission of radiation of same or longer wavelengths for a long or a short time, the phenomenon is termed as which of the following?

   a) Luminescence b) Fluorescence

   c) Phosphorescence d) Spontaneous emission

5. Quantum Dots are spherical semiconductor nanocrystals made of elements from the periodic groups

a) IIB-VI or III-V b) IIA – V

c) IIIB- VII d) None of these

6. Nano in Greek means

a) Small b) Dwarf c) Little d) Micro

7. Whole cells to detect chemical compounds usually by electrical, thermal or optical signal is called

a) Sensor b) Biosensor c) Bio- receptor d) Transducer

8. SPM stands for

a) Scanning Probe Microscopy

b) Scanning particle Microscopy

c) Scanning Probe Macroscopy

d) Scanning Probe electron Microscopy

9. Nanoparticles of _____ glow when exposed to ultraviolet light.

a) Cadmium selenide b) Chromium selenide

c) Nickel selenide d) Gold

10. Gold nanoparticles exhibit a variety of color characteristics at which relative scale?

a) 10^{-10} b) 10^{-9} c) 10^{-8} d) 10^{-7}

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. What do you mean by Nanochemistry?

12. Give two uses of Quantum dots.

13. Jot down the properties of an ideal nanocrystals.

14. What is the significance of PI of nanoparticles?

15. What are the physical properties measured in sensor?

16. Write two applications of tecto dendrimers, in medicine.

17. Define: Smart dust.

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) . Tabulate the difference between SEM & TEM?

[OR]

b). Describe the principle and working of TEM with neat a diagram

19. a). Outline the synthesis of quantum dots:

i) in confined media ii) via molecular processes.

[OR]

b). Discuss the electronic structure of nanocrystals

20. a). Explain the nature of interaction between biomolecules and nanoparticles.

[OR]

b). Briefly comment on any two inorganic materials used for synthesis of hybrid nano-bio assemblies.

21. a). Write notes on ‘nano –biosensors’

[OR]

b). Write notes on ‘sensor of the future’

22. a). Define following terms

i) Nanoshells. ii) Nanopores

[OR]

b). Enumerate the uses of gold nanoparticle in medical filed.

SECTION – D

Answer any THREE Questions : (3 × 10 = 30)

23. Explain the working of SEM with a neat sketch.

24. Explain in details the various ways to study quantum dots.

25. List any five application of nanobiology

26. Give detail account on electrochemical sensor

27. Discuss the diagnostic applications of nanotechnology in medical filed

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B.A. & B.Sc. Degree (Semester) Examinations, April 2020
Part – IV : Non Major Elective Subject : Second Semester : Paper – I

CHEMISTRY IN MEDICINE
Under CBCS – Credit 2

Time: **2** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. The golden rule of first aid is
   a) slowly,haste b) haste,slowly c) fastly,less d) less,fastly
2. Alkali poisoning is caused by
   a) Caustic Soda b) Caustic Potash c) Ammonia d) All the above
3. All infectitious diseases are caused by _____
   a) bacteria b) fungi c) algae d) germs
4. Filariasis is charaterised by the swelling of
   a) neck b) hands c) legs d) head
5. Which of the following compound is used in photography:
   a) Ferrous fumarate b) Ferric Ammonium Citrate
   c) Ferrous Gluconate d) Ferrous Sulphate
6. Impaired growth is due to the deficiency of:
   a) Al b) Ca c) Na d) Zn
7. Well known laughing gas is
   a) N_2O b) N_2O_2 c) NO d) NO_2

8. The pain reliever for gastric ulcer is

   a) Cocaine b) Benzocaine c) Procaine d)Amethocaine

9. Juice of Tinospora cordifolia is good for

   a) Kidney b) Lungs c) Liver d) Heart

10. Pulikkirai belongs to which family

    a) Portulacaceae b) Basellaceae c) Gramineae d) Solanaceae

SECTION – B

Answer any FIVE Questions : (5 × 2 = 10)

11. Write down the contents of first aid box.
12. Define the term 'drug'.
13. Quote any two insect borne diseases and its causing organism.
14. Write two names of phosphorus compounds used in allopathy.
15. Write any two significances of compounds of Iodine.
16. What are the two types of general anaesthetics. Give examples.
17. State the medicinal value of spinach.

SECTION – C

Answer ALL Questions : (3 × 9 = 27)

18. a) Give the antidotes for the following cases:

    i)acid poisoning ii) poisoning by disinfectants iii) merucy poisoning

    [OR]

    b) Discuss in detail any three water borne diseases.

19. a) List out the compounds of Alumnium that promote the health of human beings and write its uses.

    [OR]

    b) Define anaesthetics. Write its classification. Expalin the following anaesthetics: i) ether ii) chloroform

20. a) State the active constituents and medicinal properties of:

    i) Hibisscus Rosa ii) Adathoda Vasia iii) Azadirachta Indica

    [OR]

    b) Give a gist on the following medicinal plants:

    i) Tulasi ii) Killaynelli iii) Thuduvalai

SECTION – D

Answer any TWO Questions : (2 × 14 = 28)

21. Define first aid. Jot down its basic rules. Write the same for:

    i) bleeding ii) burns iii) fainting.

22. Explain the common air borne diseases, highlighting its causing organism, symtoms, control, treatment and prevention.

23. Discuss the biological role of the following elements in the maintenance of health: a) Sodium b) Pottasium c) Calcium

24. Elaborate on the chemical structure, uses and disadvantages of local anaesthetics.

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B.Sc. Chemistry Degree (Semester) Examinations, April 2020
Part – IV : Skill Based Subject : Fourth Semester : Paper – I

BIOMOLECULES
Under CBCS – Credit 2

Time: **2** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Which of the following macro-molecule can be most structurally diverse among living world?

   a) Carbohydrates b) Proteins

   c) Nucleic acids d) Lipids

2. The degree of unsaturation of lipid can be measured as _____.

   a) Saponification number b) iodine number

   c) Reichert-Meissl number d) Polenske number

3. The formation of a peptide bond between two amino acids is an example of a(n)_____reaction.

   a) Cleavage b) condensation

   c) group transfer d) isomerization d) oxidation reduction

4. Five elements present in most naturally occurring proteins are

   a) C,H,O,P and S b) C,H,O,N and I c) C,H,O,N and S d) C,H,O,S and I

5. A nucleotide consists of

   a) Base and sugar b) Sugar and phosphate

   c) Base, Sugar and phosphate d) Base and phosphate

6. RNA contains

   a) Ribose sugar and thymine b) Ribose sugar and Uracil

   c) Deoxyribose sugar and Uracil d) Deoxyribose sugar and thymine

7. The 'lock and key hypothesis' mechanism is related with:

   a) Digestion of fat in the body b) For enzyme specificity

   c) For the formation of vacuole d) Explosives

8. Who coined the word enzyme?

   a) Wilhelm Kuhne b) Alfred Russel

   c) Robert Koch d) Rosalind Franklin

9. Retinol is the scientific name of which vitamin?

   a) Vitamin A b) Vitamin D c) Vitamin K d) Vitamin C

10. Liver damage is caused due to the overdose of which vitamin?

    a) Vitamin B_1 b) Vitamin B_2 c) Vitamin B_3 d) Vitamin D

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Define derived lipids.

12. What is the function for lipids?

13. How do you make peptide bonds?

14. What nitrogen containing bases occur in nucleic acid?

15. What is mean by Coenzyme?

16. Define Enzyme inhibitor.

17. Write any three primary sources of vitamin-A and D?

SECTION – C

Answer ALL Questions : **(3 × 9 = 27)**

18. a) Discuss types and importance of lipids.

[OR]

b) i) What is Zwitterion and isoelectric point? (5)

ii) What is meant by polar and nonpolar amino acids? Give example. (4)

19. a) Explain following synthesis process:

i) Gabriel phthalimide synthesis and ii) Strecker Synthesis of alanine

[OR]

b) i) Compare Nucleoside and Nucleotide? ii) Discuss types of RNA. (4+5)

20. a) i) Write short notes on classification of enzyme. (6)

ii) Define enzyme active site. (3)

[OR]

b) Discuss functions and deficiency of water soluble vitamins.

SECTION – D

Answer any TWO Questions : (2 × 14 = 28)

21. Explain briefly how to check purity of fats and oils using following methods:

i) iodine number ii) Reichert-Meissl number

iii) saponification number and iv) acid number

22. In general, Proteins can be classified into 3 different groups. Name and give a short description of each types. How they are distinct from one another**.**

23. Briefly explain the following terms:

i) lock and key mechanism and

ii) Competitive and Non-competitive inhibition.

24. i) Discuss functions and deficiency of fat soluble vitamins.

ii) Define Antivitamins.

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B.Sc. Chemistry Degree (Semester) Examinations, April 2020
Part – IV : Skill Based Subject : Sixth Semester : Paper – I

CHEMISTRY AND GENERAL APTITUDE FOR COMPETITIVE EXAMINATION
Under CBCS – Credit 2

Time: **2** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. How many periods and groups are present in the periodic table?
   a) 7 periods and 7 groups b) 18 periods and 7 groups
   c) 7 periods and 18 groups d) 8 periods and 8 groups
2. Which of the following forms the basis of the modern periodic table?
   a) Atomic mass b) Atomic number
   c) Number of nucleons d) Mass number
3. What is the other name for group 18^{th} elements?
   a) Noble gases b) Alkali metals
   c) Alkali earth metals d) Halogens
4. Element X forms a chloride with the formula XCl_2
   a) Na b) Mg c) Al d) Si
5. Which group elements are called transition metals?
   a) Group number 1 to 2 b) Group number 13 to 18
   c) Group number 3 to 12 d) Group number 1 to 8
6. All the elements in a group in the periodic table have the same_____
   a) Same number of valence electrons b) Atomic number
   c) Atomic weight d) None of the above

7. As we go from left to right across period, electron affinity

a) Increases b) Decreases c) Remains same d) None of above

8. When an electron is added in valence shell then

a) Energy is absorbed b) Energy is released

c) Energy remains same d) Force of attraction increases

9. Elements that lie in same column have

a) Similar properties b) Different properties

c) Same physical properties d) Different chemical properties

10. Which one is known as the father of periodic table?

a) Mendeleev b) Lavoisier c) Neil Bohr d) Rutherford

11. In which of the following pairs of molecules/ions both the species are not likely to exist?

a) H_2^+, He_2^{2-} b) H_2^-, He_2^{2-} c) H_2^{2+}, He_2 d) H_2^-, He_2^{2+}

12. The hybridization of orbitals of N atom in NO_3^-, NO_2^+ and NH_4^+ respectively

a) sp, sp^2, sp^3 b) sp^2, sp, sp^3 c) sp, sp^3, sp^2 d) sp^2, sp^3, sp

13. The molecule having smallest bond angle is

a) NCl_3 b) $AsCl_3$ c) $SbCl_3$ d) PCl_3

14. The structure of IF_7 is

a) Square pyramidal b) Trigonal bipyramidal

c) Octahedral d) pentagonal bipyramidal

15. Which of the following hydrogen bond is the strongest?

a) O—H----N b) F—H----F c) O—H----O d) O—H----F

16. Which complex cannot ionize in solution?

a) $[Pt(NH_3)_6]Cl_4$ b) $K_2[ptF_6]$ c) $K_4[Fe(CN)_6]$ d) $[CoCl_3(NH_3)_3]$

17. Among H_2O, NH_3, CO and F^-, the ligand that stabilizes the low oxidation state of W is_____

a) H_2O b) NH_3 c) CO d) F^-

18. Which one of the following configuration will show Jahn-Teller distortion in the octahedral field

a) high spin d^8 b) high spin d^4 c) high spin d^5 d) low spin d^6

19. A species having a tendency to donate electron pairs to form coordinate covalent bond are called_____

a) Arrhenius base b) Lewis acid c) Lewis base d) Bronsted base

20. Which of the following is constitutes a group of the isoelectronic species?

a) C_2^{2-}, O_2^-, CO, NO b) NO^+, C_2^{2-}, CN^-, N_2

c) CN^-, N_2, O_2^{2-}, CO_2^{2-} d) N_2, O_2^-, NO+, CO

21. Absorbance of sample is directly proportional to the concentrations of the attenuating species in the material sample.

a) Lambert's law b) Beer's Law

c) Stark Einstein Law d) Beer-Lambert’s laws

22. An increase in equivalent conductance of a strong electrolyte with dilution is mainly due to

a) Increase in number of ions and ionic mobility of ions

b) Increase in number of ions

c) Increase in mobility of ions

d) 100% ionization of electrolyte at normal dilution

23. In secondary cells, the cell reactions are

a) Irreversible b) at equilibrium

c) reversible d) spontaneous

24. If there are 4 atoms in unit cell in a cubic system, it is an example of

a) Simple cubic unit cell b) Body centred cubic unit cell

c) Face centred cubic unit cell d) Hexagonal closed unit cell

25. In Bragg's equation, 'd' represents

a) The number of moles b) The interplanar distance

c) The Avogadro's number d) The order of reflection

26. In photochemical reactions, the absorption of light takes place in

a) Primary processes only

b) secondary processes only

c) Either primary or secondary process

d) both primary and secondary processes

27. Which of the following statement is incorrect regarding physisorption?

a) It occurs because of van der Waals forces

b) More easily liquefiable gases are adsorbed readily

c) Under high pressure, it result into multi molecular layer on adsorbent surface

d) Enthalpy of adsorption is slow and positive

28. In Haber's process for the manufacture of ammonia

a) Finely divided iron is used as catalyst

b) Finely divided molybdenum is used as catalyst

c) Finely divided nickel is used as catalyst

d) No catalyst is necessary

29. A reaction involving two different reactants can never be

a) Bimolecular reaction b) Second order reaction

c) First order reaction d) Unimolecular reaction

30. If the order of reaction is zero. It means that

a) Rate of reaction is independent of temperature

b) Rate of reaction is independent of the concentration of the reacting species

c) The rate of formation of activated complex is zero

d) The rate of decomposition of activated complex is zero

31. The reactions of higher order are rare because

a) Many-body collisions involve very high activation energy

b) Many-body collisions have a low probability

c) Many-body collisions are not energetically favoured

d) Many-body collisions can take place only in the gaseous phase

32. One of the following molecules contain 3 horizontal planes

a) Water b) CO2 c) Benzene d) SF6

33. The molecule which has inversion center and S_6 axis is

a) Chlorobenzene b) *p*-dichlorobenzene

c) 1,3,5 trichlorobenzene d) Chair form of cyclohexane

34. Which of the following types of waves has the shortest wavelength?

a) UV rays b) Microwaves c) Radio waves d) X-ray

35. The correct order of different types of energies is

a) $E_{el} >> E_{vib} >> E_{rot} >> E_{tr}$ b) $E_{el} >> E_{rot} >> E_{vib} >> E_{tr}$

c) $E_{el} >> E_{vib} >> E_{tr} >> E_{rot}$ d) $E_{tr} >> E_{vib} >> E_{rot} >> E_{el}$

36. In Raman spectrum, if λ is the wavelength of incident radiation, then the Stoke's lines will have wavelength equal to

a) λ b) $\lambda + \Delta\lambda$ c) $\lambda - \Delta\lambda$ d) λ^2

37. Select the incorrect statement from the following option.
    a) TMS stands for tetra methyl silane
    b) All the hydrogen in TMS have the same chemical shift
    c) TMS has a high boiling point, so it is not easily lost when holding the NMR sample
    d) TMS is relatively unreactive with most functional groups
38. What is the x-axis of a mass spectrum?
    a) mass b) mass/energy c) mass/charge d) charge
39. H_2 gas is absorbed on the metal surface like tungsten. This follows _____ order reaction
    a) Third b) Second c) Pseudo first d) Zero
40. Increasing order of stability among three main conformations (eclipse, anti, Gauche) of 2-fluoroethanol is
    a) Eclipse, Gauche, Anti b) Gauche, Eclipse, Anti
    c) Anti, Gauche, Eclipse d) Eclipse, Anti, Gauche
41. The reaction of toluene with Cl_2 in the presence of $FeCl_3$ gives predominantly
    a) Benzoyl chloride b) Benzyl chloride
    c) o-and p-chloro toluene d) m-chloro toluene
42. The major product obtained on the interaction of phenol with NaOH and CO_2 is
    a) benzoic acid b) salicylaldehyde
    c) salicylic acid d) phthalic acid
43. Among the following the most basic compound is
    a) p-nitroaniline b) Acetanilide c) Aniline d) Benzylamine
44. Which one of the following methods is neither meant for the synthesis not for separation of amines?
    a) Curtius reaction b) Wurtz reaction
    c) Hofmann method d) Hinsberg method
45. The correct order of acid strength of the following is (I) Phenol (II) p-cresol (III) m-nitrophenol (IV) p-nitrophenol
    a) III > II > I > IV b) IV > III > I > II
    c) II > IV > I > III d) I > II > IV > III
46. Which one of the following has the minimum boiling point?
    a) n-butane b) 1-butyne c) 1-butene d) isobutene
47. Which of the following is not aromatic?
    a) Benzene b) Cyclo-octatetrarenyl dianion
    c) Tropyllium cation d) Cyclopentadienyl cation
48. Among the following the most basic compound is
    a) p-nitroaniline b) Acetanilide c) Aniline d) Benzylamine
49. Which one is the stable carbanion
    a) Primary b) Secondary c) Tertiary d) all the above
50. Tertiary alkyl halides are practically inert to SN2 mechanism because of
    a) Inductive effect b) Instability
    c) Steric hindrance d) Insolubility
51. If 782 = 20 and 671 = 17, then 884 =? (339)
    a) 32 b) 19 c) 26 d) 23
52. (10.8 X 16 X 12) + (3.6 X 56 X 9.2) =?
    a) 3941.35 b) 3966.89 c) 3928.32 d) 3645.19

53. If ₹.7500 are borrowed at C.I at the rate of 4% per annum, then after 2 years the amount to be paid is?

a) ₹.8082 b) ₹.7800 c) ₹.8112 d) ₹.8100

54. At the end of three years what will be the compound interest at the rate of 10% p.a. on an amount of Rs.20000?

a) ₹.6620 b) ₹.6500 c) ₹.6800 d) ₹.6400

55. If the sides of a triangle are 26 cm, 24 cm and 10 cm, what is its area?

a) 120 cm^2 b) 130 cm^2 c) 312 cm^2 d) 315 cm^2

56. A cube of side one meter length is cut into small cubes of side 10 cm each. How many such small cubes can be obtained?

a) 10 b) 100 c) 1000 d) 10000

57. If the variance of 5 values is 5.6. What is the standard deviation of those values

a) 4.35 b) 3.95 c) 2.85 d) 25.65

58. Find the range of the following data:

143, 148, 135, 150, 128, 139, 149, 146, 151, 132

a) 23 b) 24 c) 25 d) 22

59. Find the next term in series 23J48, 17G12, 13D4, _____?

a) 11A2 b) - 6G0 c) - 5F1 d) - 8H6

60. What will the 12th letter of the alphabet if the second half of the alphabet is written in reverse order?

a) H b) G c) L d) X

61. The inverse ratio of 3: 2: 1 is?

a) 1:2:3 b) 2:3:1 c) 3:1:2 d) 2:3:6

62. 1: 3 = 1 2/3: x. The value of x is?

a) 1 b) 4 c) 5 d) 12

63. After an increase of 7 in both numerator as well as the denominator, the fraction changes to 3/4. What was the original fraction?

a) 5/12 b) 7/9 c) 2/5 d) 3/8

64. The total of the ages of Amar, Akbar and Anthony is 80 years. What was the total of their ages three years ago?

a) 77 years b) 73 years c) 71 years d) 75 years

65. I have a few sweets to be distributed. If I keep 2, 3 or 4 in a pack, I am left with one sweet. If I keep 5 in a pack, I am left with none. What is the minimum number of sweets I have to pack and distribute?

a) 25 b) 37 c) 54 d) 65

66. At the end of a business conference the ten people present all shake hands with each other once. How many handshakes will there be altogether?

a) 20 b) 45 c) 100 d) 90

67. A sum of money at simple interest amounts to ₹. 815 in 3 years and to ₹. 854 in 4 years. The sum is:

a) ₹.650 b) ₹.690 c) ₹.698 d) ₹.700

68. Which of the following is mainly present in the Kidney stones?

a) Calcium Sulphate b) Sodium Oxalate

c) Calcium Oxalate d) Sodium Sulphate

69. Bio medical wastes can be removed in this method

a) Land fill b) Composting c) Incineration d) Recycling

70. The central government has decided to list which public sector company on the stock market?

a) LIC b) BSNL c) BHEL d) ONGC

71. Choose the correct alternative that will continue the same pattern and fill in the blank spaces 4, 6, 12, 14, 28, 30, ?

a) 32 b) 64 c) 62 d) 60

72. If 1 = 3, 2 = 5, 3 = 7, 4 = 9, then 7 = ?

a) 15 b) 13 c) 17 d) 11

73. Change the sign to find the equation 48 -(3 + 4) + (2 x 2) = 0

a) Change + into x b) Change x into +

c) Change - into + d) Change + into -

74. Walking at the rate of 4kmph a man cover certain distance in 2hr 45 min. Running at a speed of 16.5 kmph the man will cover the same distance in

a) 12 min b) 25 min c) 40 min d) 48 min

75. The ratio between the speeds of two trains is 7: 8. If the second train runs 440 kms in 4 hours, then the speed of the first train is:

a) 47.4 km/hr b) 57.19 km/hr c) 68.13 km/hr d) 96.25 km/hr

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST
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B.Sc. Chemistry Degree (Semester) Examinations, April 2020
Part – IV : Skill Based Subject : Sixth Semester : Paper – II

ANALYTICAL METHODS IN CHEMISTRY
Under CBCS – Credit 2

Time: **2** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Analytical chemistry is said be
   a) Qualitative b) Quantitative c) Both a & b d) partially qualitative
2. Among the following techniques which one is not said to be quantitative
   a) UV b) CV c) AAS d) SEM
3. Mostly used stationery phase in TLC is
   a) Silica b) Cellulose c) Zinc powder d) Wax
4. Mobile phase used in Column chromatography is
   a) Silica b) Diethyl ether c) Zinc powder d) Wax
5. According to Beer Lambert's Law, Absorbance is not directly proportional to
   a) Extinction coefficient b) Concentration
   c) Length d) Wavelength
6. The basic value for homo annular diene is
   a) 214 nm b) 253 nm c) 218 nm d) 265 nm

7. Cyclic Voltammetry issaid to be _____ technique

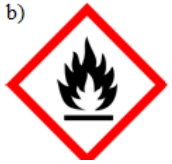
a) Analytical b) Quantitative

c) Both a & b d) partially qualitative

8. Among the following, which one is said to be counter electrode?

a) Glassy carbon b) Ag/AgCl c) Pt d) Carbon

9. Among the following, Which symbol is used to represent corrosive chemicals?

a)  b)  c)  d) 

10. Which of the following substance doesn't cause chemical burns?

a) Br b) HF c) H_2SO_4 d) Acetone

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Define the term 'Analytical Chemistry' with examples.
12. What is meant by qualitative technique and give suitable examples?
13. Mention the name of mobile & stationery phases.
14. Define the term Retention Factor (R_f).
15. Explain Beer-Lamberts Law.
16. List out the name of electrodes used in Cyclic Voltammetry.
17. Mention any two first aid procedures for acid accidents.

SECTION – C

Answer ALL Questions : **(3 × 9 = 27)**

18. a) List out the advantages and limitations of chemical and instrumental methods

[OR]

b) Write down the applications of TLC technique.

19. a) Discuss the importance of R_f values.

[OR]

b) Write down the applications of column chromatography technique

20. a) Write down the Wood Ward rules for diene and alpha beta unsaturated carbonyl systems.

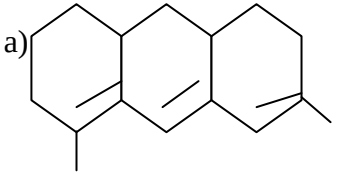
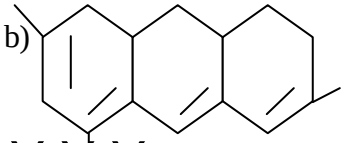
[OR]

b) List out the solvents used in TLC.

SECTION – D

Answer any TWO Questions : **(2 × 14 = 28)**

21. Explain theprinciples and working procedure for Thin Layer chromatography.
22. Briefly explain the Column chromatography technique.
23. Discuss theprinciples and working procedure for Cyclic Voltammetry technique.
24. Calculate the Ymax values for the following compound:

a)  b) 

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