VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST
(Autonomous & Residential)
[Affiliated to Madurai Kamaraj University]
B.Sc. (Bot. / Zoo.) Degree (Semester) Examinations, April 2015
Part – III : Allied Subject : Second Semester : Paper – II

INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY – II
Under CBCS – Credit 4

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

SECTION – A

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

1. Which one of the following can act as a Lewis base?
   a) AgI b) SO_3 c) BF_3 d) NH_3
2. Which of the following is a class of insecticides?
   a) stomach poisons b) contact poisons c) fumigants d) all
3. Ninhydrin test is given by
   a) carbohydrate b) protein c) alkane d) alkene
4. Which solid does not contain covalent bond?
   a) diamond b) Ice c) Methane d) Zinc
5. Pick out the gas which is responsible for green house effect
   a) CO_2 b) N_2 c) Cl_2 d) O_2
6. Define Lux Flood concept of acid.
7. Give an example of fungicides.
8. Define the term pH.
9. Define chemical bonding.
10. Mention any two adverse effects of sewage wastes.

SECTION – B

Answer ALL Questions : **(5 × 7 = 35)**

11. a) Explain Lewis concept of acid and base. **(OR)**
    b) Discuss Bronsted Lowry theory for acids and bases in brief with suitable examples.
12. a) Discuss the safe handling of pesticides. **(OR)**
    b) Write note on organic and inorganic pesticides.
13. a) Give any two synthesis of aminoacids. **(OR)**
    b) Write a note on polypeptide.
14. a) Explain ozone layer depletion. **(OR)**
    b) Discuss the classification of air pollutants with examples.
15. a) Explain the properties of ionic bond. **(OR)**
    b) Discuss the characteristics of covalent bond.

SECTION – C

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

16. Write a note on following acid-base theories i) Arrhenius concept ii) Usinovich concept iii) Cady –Elsey theory
17. What are pesticides? Discuss in details the environmental effects of pesticides.
18. Discuss the biological function of vitamins.
19. i) Discuss in detail about the Born –Haber cycle.
    ii) Write short notes on the hydrogen bonding.
20. Explain in detail all the steps involved in treatment of water for drinking purpose.

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B.Sc. Physics Degree (Semester) Examinations, April 2015
Part – III : Allied Subject : Second Semester : Paper – II

INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY
Under CBCS – Credit 4

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

SECTION – A

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

1. Which one of the following will be smallest in size?
   a) Li b) Na c) K d) Cs
2. Photosynthesis is a process involving
   a) photosensitisation b) synthesis of carbohydrate
   c) in the presence of chlorophyll d) all the above
3. A crystalline solid does not one of the following properties
   a) anisotropy b) isotropy
   c) sharp melting point d) definite and regular geometry
4. One Faraday _____.
   a) 90,500 coulombs b) 2 mole electrons
   c) 96,000 coulombs d) 1 mole electrons
5. Among the following which is a mobile phase?
   a) cellulose b) alumina c) chloroform d) none of the above
6. Why second ionization energy is often greater than first ionization energy?
7. State Grothus –Drapper law.
8. Write different types of symmetry elements present in a solid.
9. What is cell constant?
10. Define R_f factor in chromatographic technique.

SECTION – B

Answer ALL Questions : **(5 × 7 = 35)**

11. a) Explain and arrange the following atoms in their decreasing order of electronegativity value F, Cl, Br and I.

(OR)

b) Discuss the periodic trends of electron affinity.

12. a) Discuss chemiluminescence with examples.

(OR)

b) State and explain i) Beer's law
ii) Lambert's law and iii) Beer- Lambert's law

13. a) Differentiate crystalline solid from amorphous solid.

(OR)

b) Define the following terms i) unit cell
ii) edge of the crystal iii) interfacial angle

14. a) Write note on the following electrodes
i) hydrogen electrode ii) calomel electrode

(OR)

b) Differentiate voltaic cell from Daniel cell.

15. a) Write a note on developing a paper chromatogram. Mention few applications of paper chromatography.

(OR)

b) Explain how a chromatoplate can be prepared for TLC and mention the applications of TLC.

SECTION – C

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

16. Write a note on the periodic trends of the following.
a) ionization energy b) atomic size
17. Explain the photophysical phenomena using Jablonski diagram.
18. Discuss the classification of solids.
19. Explain the following. i) Faraday's laws of electrolysis
ii) Nernst equation for EMF of cells
20. Discuss how column chromatography could be used for the separation of mixture of different compounds.

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST
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B.Sc. Chemistry Degree (Semester) Examinations, April 2015
Part – III : Core Subject : Second Semester : Paper – I

INORGANIC AND ORGANIC CHEMISTRY – I
Under CBCS – Credit 3

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

SECTION – A

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

1. The bond order of oxygen molecule is

   a) 1 b) 2 c) 3 d) 0

2. In S_N1 reaction, the first step is the formation of

   a) Carbocation b) Free radical

   c) Carbanion d) None of the above

3. Which one is benzyl alcohol?

   a) CH_3CH_2OH b) $OH\text{-}CH_2\text{-}CH_2\text{-}OH$

   c)$CH_2=CH\text{-}OH$ d) $C_6H_5\text{-}CH_2OH$

4. A Grignard reagent may be obtained by reacting magnesium with

   a) Diethy ether b) Ethyl iodide

   c) Methyl amine d) Propyl amine

5. Acetylene tetra chloride is called as

   a) Chloroprene b) Westron c) CFC d) Chloroethene

6. Define bond order.

7. How is carbon tetrachloride prepared?

8. What are dihydric alcohol? Give an example.

9. Give any two examples for organometallic compounds.

10. How is vinyl chloride prepared?

SECTION – B

Answer ALL Questions : **(5 × 7 = 35)**

11. a) Discuss about VB theory. Explain the sp^3 hybridization with suitable example.

(OR)

b) i) What is mean by hybridization, bonding and anti-bonding orbitals? **(4 + 3)**

ii) Calculate the bond order of H_2 and N_2-molecule.

12. a) What are S_N1 and S_N2 reactions? Discuss the mechanism of both.

(OR)

b) Describe the preparation of chloroform. What happens when Chloroform is i) Oxidised with air and sunlight

ii) Boiled with KOH.

13. a) Explain the preparation and properties of benzyl alcohol.

(OR)

b) Discuss the preparation and properties of ethyl alcohol.

14. a) How is TEL prepared?

Explain its properties and synthetic applications.

(OR)

b) How is diethyl zinc prepared in the laboratory?

Explain their properties and uses.

15. a) How is westron prepared? Explain their properties and uses.

(OR)

b) How is chlorobenzene prepared? Mention its important properties.

SECTION – C

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

16. Discuss about VSEPR theory and its applications.

17. a) Describe the properties of CCl_4. **(3 + 4 + 3)**

b) Explain E1 and E2 mechanism with suitable examples.

c) Discuss about estimation of available chlorine in bleaching powder.

18. How is ethylene glycol and glycerol prepared?

19. What are Grignard reagent? How it is prepared?

Explain its important properties and synthetic applications.

20. Describe the preparation of

i) Freon ii) Chloroprene iii) Allyl iodide

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST
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[Affiliated to Madurai Kamaraj University]
B.Sc. Chemistry Degree (Semester) Examinations, April 2015
Part – III : Core Subject : Second Semester : Paper – II

PHYSICAL CHEMISTRY – I
Under CBCS – Credit 4

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

SECTION – A

Answer ALL Questions : (10 × 1 = 10)

1. Nuclides having the same atomic number and mass number are known as
   a) Isomer b) Isotopes c) Isotones d) Isobars
2. The rate of decay of a radioactive element
   a) decreases directly with time b) decrease inversely with time
   c) decreases exponentially with time d) remains constant
3. Which has no rotation symmetry?
   a) Hexagonal b) Orthorhombic c) Cubic d) Triclinic
4. Which of the following belongs to cubic system?
   a) Alums b) KNO_3 c) Diamond d) KCl
5. Graphite is a example of _____ crystal system.
   a) metallic b) covalent c) molecular d) ionic
6. What are isotopes?
7. What do you understand by term nuclear fission?
8. Define the term unit cell.
9. What is crystallography?
10. What is liquid crystal?

SECTION – B

Answer ALL Questions : (5 × 7 = 35)

11. a) Describe the following. i) Mass defect
    ii) Binding energy iii) Packing fraction **(OR)**
    b) Write a short note on the following with example. i) Isotones
    ii) Isomers iii) Stable nuclides iv) Radioactive nuclides
12. a) Explain the principle, working and application of Geiger Muller counter. **(OR)**
    b) Explain the application of radioactive isotopes in medicine and agriculture.
13. a) Describe i) Miller indices and ii) Weiss indices **(OR)**
    b) How can you classify the crystalline solids with their properties?
14. a) Write the various types of crystal system, their axial ratios and angles and unit cells. **(OR)**
    b) Discuss bravais lattices of face centered cubic system.
15. a) Give an account of ionic crystal. **(OR)**
    b) Write a note on covalent crystal with example.

SECTION – C

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

16. Explain the stability of nuclei in terms of n/p and nuclear binding energy.
17. What are nuclear reactors? How they are classified? Explain the working of thermal reactor.
18. a) Explain the terms: plane of symmetry, axis of symmetry, center of symmetry and elements of symmetry.
    b) Differentiate between crystalline solid and amorphous solid.
19. a) Derive the Bragg equation for X-ray crystallography.
    b) How can you determine the interplanar distance by powder method?
20. Discuss briefly the following crystal defects?
    i) Point defects ii) Schottky defects iii) Frenkel defects

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B.Sc. Chemistry Degree (Semester) Examinations, April 2015
Part – III : Core Subject : Fourth Semester : Paper – I

ORGANIC AND PHYSICAL CHEMISTRY
Under CBCS – Credit 4

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

SECTION – A

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

1. Acetic acid undergoses reduction with $LiAlH_4$
   a) Ethanol b) Ethane c) Ethanal d) Ethyne
2. Malonic ester reacts with urea in presence of $POCl_3$
   a) Veronal b) Barbituric acid c) Luminal d) Parabonic acid
3. Invert sugar is
   a) Mixture of glucose + galactose b) Mixture of glucose + fructose
   c) Mannose d) Glucose
4. Water drops are spherical because of
   a) Surface tension b) Viscosity
   c) High boiling point d) High specific heat
5. The Nernst's distribution law is also known as
   a) Henry's law b) Raoult's law
   c) Equilibrium law d) Partition law
6. What happens when formic acid is treated with PCl_5?
7. How is anisole prepared from benzene diazonium chloride?
8. What happens when glucose is treated with bromine water?
9. Define viscosity.
10. State Henry's law.

SECTION – B

Answer ALL Questions : **(5 × 7 = 35)**

11. a) i) Explain why formic acid is a stronger acid than acetic acid?

ii) What is the effect of heat on alpha, beta and gamma hydroxyl acids?

(OR)

b) Discuss the preparation and properties of glycine.

12. a) Give the preparation and properties of glyoxalic acid.

(OR)

b) How will you synthesis the following compounds from acetoacetic ester. i) Methyl ketone ii) 2,5-Hexanedione iii) 4-Methyl uracil

13. a) Explain the following i) Mutarotation ii) Epimerization

(OR)

b) Describe the structure of starch and cellulose.

14. a) Define Dipole moment. How will you determine the dipole moment?

(OR)

b) Write a note on Magnetic properties.

15. a) How will you determine the equilibrium constant from distribution coefficient?

(OR)

b) Write short notes on the following

i) Multiple extraction ii) Liquid-Liquid chromatography

SECTION – C

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

16. a) What happens when benzoic acid is treated with

i) Con.H_2SO_4 ii) PCl_5 iii) $LiAlH_4$

b) i) How will you prepare salicylic acid from phenol?

ii) Give any two chemical properties of anthranilic acid.

17. How will you synthesis the following compounds from Malonic ester? i) Dimethylacetic acid ii) Succinic acid iii) Adipic acid iv) Crotonic acid

18. a) How will you perform the following conversions

i) Glucose into Fructose ii) Fructose into Glucose

19. Describe the following i) Dipole moment and molecular structure ii) Optical activity and chemical constitution

20. Explain the following i) Determination of association ii) Determination of dissociation iii) Determination of solubility iv) Distribution indicators

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B.Sc. Chemistry Degree (Semester) Examinations, April 2015
Part – III : Core Subject : Fourth Semester : Paper – II

INORGANIC CHEMISTRY – I
Under CBCS – Credit 4

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

SECTION – A

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

1. An element which does not form stable hydride is
   a) Pt b) Ca c) Li d) Na
2. Which one of the following is pseudohalogen
   a) ICl b) $(CN)_2$ c) IF_7 d) $HClO_3$
3. The hardness of water is due to the presence of _____ present in water.
   a) KCl b) NaCl c) $Ca(HCO)_3$ d) NaOH
4. Magneson reagent is a specific precipitant for
   a) Zn b) Fe c) Ni d) Mg
5. Titania is nothing but
   a) Throium oxide b) V_2O_5 c) TiO_2 d) $CaOCl_2$
6. The structure of hydrogen peroxide is _____.
7. What are brominating mixture?
8. The concentration of the solution is expressed in terms of _____.
9. Write the structure of EDTA.
10. Write any two uses of V_2O_5.

SECTION – B

Answer ALL Questions : **(5 × 7 = 35)**

11. a) What are oxides and hydrides? How are they classified? Give examples for each type.

(OR)

b) Discuss about preparation and properties of hydrogen peroxide.

12. a) i) Explain the anomalous behavior of fluorine. **(4 + 3)**

ii) Explain the basic nature of iodine.

(OR)

b) i) What are the interhalogen compounds? **(4 + 3)**

Give any five examples. Explain their general properties.

ii) What are polyhalides? Give examples.

13. a) Define standard solution. What are the requirements of primary standard solution?

(OR)

b) Explain the various types of indicators and titrations used in volumetric analysis.

14. a) What are the uses of magneson reagent, aluminon reagent and DMG in inorganic qualitative analysis?

(OR)

b) Write a short note on thiourea, uranylzinc acetate, rhodamineB and alizarin.

15. a) How is TiO_2 and ThO_2 are prepared? Explain their properties?

(OR)

b) Discuss the preparation, properties and uses of chloroplatinic acid.

SECTION – C

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

16. a) Explain the preparation, properties and structure of ozone. **(6)**

b) How is H_2O_2 estimated? **(4)**

17. a) Give the details of modern method of isolation of fluorine. **(4)**

b) What are pseudohalogens? Give some examples. **(3 + 3)**

c) Discuss about estimation of available chlorine in bleaching powder.

18. What is meant by hardness of water? How is it classified? How can you determine the hardness of water by EDTA method?

19. How will you estimate Mg and Ni by using EDTA?

20. Explain the preparation, properties and uses of the following compounds. a) Ammonium molybotate

b) V_2O_5

c) Sodium cobalt nitrate

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B.Sc. Chemistry Degree (Semester) Examinations, April 2015
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. Define monomer and polymer.
2. What is nylon-66?
3. The conversion of ketoximes to N-substituted amides is known as _____ rearrangement.
   a) Hofmann b) Curtius c) Beckmann d) Claisen
4. Define electrode potential.
5. The order of priority of heteroatom for naming of a heterocyclic ring should be
   a) S, N, O, P b) O, S, N, P c) N, P, O, S d) O, P, N, S
6. Mention the source of coniine and piperine.
7. What is isoprene unit?
8. Mention the deficiency caused by ascorbic acid and thiamine.
9. What is electromagnetic spectrum?
10. Explain the term, “chemical shift” in NMR.

SECTION – B

Answer ALL Questions : **(5 × 7 = 35)**

11. a) Discuss briefly: i) Number average molecular weight. **(3½)**
ii) Weight average molecular weight. **(3½)**

(OR)

b) Write notes on natural and synthetic rubber.

12. a) Explain the following rearrangement with mechanism. **(4 + 3)**
i) Claisen rearrangement.
ii) Wagner-Meerwin rearrangement.

(OR)

b) Discuss briefly the electro oxidation and electro reduction reactions.

13. a) Discuss: i) Fischer indole synthesis with mechanism. **(5 + 2)**
ii) Electrophilic substitution in furan.

(OR)

b) Discuss: i) Skraup synthesis of quinoline. **(3½ + 3½)**
ii) Bischler-Napieralski synthesis of isoquinoline.

14. a) i) Discuss a method of synthesis of citral. **(5 + 2)**
ii) Highlight the importance of thiamine.

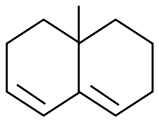
(OR)

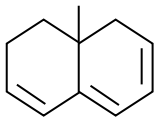
b) i) Give the structure and properties of menthol. **(4 + 3)**
ii) How will you prepare sulphanilamide and sulphapyridine?

15. a) i) Define chromophore and auxochrome. Give examples. **(5)**
ii) What is finger print region in IR? **(2)**

(OR)

b) Calculate λmax for the following dienes. **(4 + 3)**

i) 

ii) 

SECTION – C

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

16. Give the preparation of following polymer: **(2 ½ × 4 = 10)**
i) Polyethylene
ii) Polyvinyl chloride
iii) Teflon
iv) Terylene

17. Discuss the mechanism of following rearrangement reactions.
i) Hofmann rearrangement. **(5 + 5)**
ii) Beckmann rearrangement.

18. Elucidate the structure of coniine.

19. i) Mention the structure and importance of testosterone and progesterone. **(4 + 4)**
ii) Discuss the properties of limonene. **(2)**

20. i) What is anisotropic effect? **(3)**
ii) Discuss the ^{1}H NMR for the following molecules.
a) 1,1,2-Tribromoethane **(3½)**
b) Toluene **(3½)**

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B.Sc. Chemistry Degree (Semester) Examinations, April 2015
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. The constant for a reaction depends upon each of the following except
   a) solvent for solutions b) temperature
   c) concentration of reactants d) nature of reactants
2. BF_3 molecule possesses _____ C_2 axes of symmetry.
   a) one b) Two c) Three d) none of the above
3. Pick out the molecule shows rotational spectra
   a) CO b) H_2 c) C_6H_6 d) N_2
4. The number of vibrational frequencies in CO_2 molecule are
   a) 3 b) 2 c) 4 d) 7
5. The molecular mass of a parent ion is 123 and the daughter ion is 108; the meta stable peak will appear around m/e value _____.
   a) 15 b) 95 c) 140 d) 93
6. Why are the reactions of higher order rare?
7. What is called order of the group?
8. Define electromagnetic spectum?
9. Give any one advantages of Raman over IR.
10. How does hyperfine interaction occur in ESR spectra?

SECTION – B

Answer ALL Questions : **(5 × 7 = 35)**

11. a) Discuss the effect of temperature on the rate of a reaction.

(OR)

b) What is meant by zero order reaction? Write mathematical expression for zero order reaction.

12. a) Explain the following with diagrams: i) Plane of symmetry ii) Improper axis of rotation iii) Centre of symmetry

(OR)

b) Define the following terms i) sub group ii) Abelian and non abelian groups iii) Class

13. a) i) Write a note on absorption and emission spectrum. **(4 marks)**

ii) What are the selection rules for rotational and vibrational spectra? **(3 marks)**

(OR)

b) What are different types of molecular spectra?

14. a) How do you explain Rayleigh line, Stokes' lines and anti-Stokes' lines in Raman spectra?

(OR)

b) Write an expression for vibrational energy of a diatomic molecule taking it as a simple harmonic oscillator.

15. a) Explain the McLafferty rearrangement with four examples.

(OR)

b) Explain the hyperfine splitting occur in methyl radical with energy diagram.

SECTION – C

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

16. i) Differentiate order and molecularity of a reaction. **(3)**

ii) Discuss collision theory of reaction rates. **(7)**

17. i) Using group multiplication table give the symmetry operations of H_2O molecule**.**

ii) Illustrate point groups with examples.

iii) Explain why H_2O is Abelian whereas NH_3 molecule is non abelian.

18. Derive an expression for the rotational energy of a diatomic molecule taking it as rigid rotator. Draw the rotational energy level diagram for such a molecule.

19. i) Compare Raman and IR spectra. **(4)**

ii) Give the applications of study of IR. **(6)**

20. i) Write a note on spin- spin coupling with suitable example.

ii) Explain parent and base peak formed in mass spectroscopy.

iii) What is nitrogen rule? **(5 + 3 + 2)**

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B.Sc. Chemistry Degree (Semester) Examinations, April 2015
Part – III : Elective Subject : Sixth Semester : Paper – II

NANOCHEMISTRY
Under CBCS – Credit 4

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

SECTION – A

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

1. One nanometer is
   a) One billionth of a meter b) One trillionth of a meter
   c) One billionth of a centimetre d) One billionth of a millimetre
2. Nano in Greek means-
   a) Small b) Dwarf c) Little d) Micro
3. Carbon nano tubes are members of which structural family?
   a) Amines b) Polyanilines c) Glycerol d) Fullerene
4. Maximum nanotechnology focus is on-
   a) Semiconductors b) Hybrid materials
   c) Health care d) Information Technology
5. Nanocrystals arce mainly used in
   a) Biomedical field b) Electronic field
   c) Field of Magnetism d) All the above
6. What is nanotechnology?
7. What are quantum dots?
8. What is meant by top-down approaches?
9. What is the expansion of CNT?
10. Name one nanoparticle used for antibacterial applications.

SECTION – B

Answer ALL Questions : **(5 × 7 = 35)**

11. a) What are the nanomaterials? How are they classified?
    (OR)
    b) i) List any four nanomaterials. **(2 + 5)**
    ii) Write a note on the ethical and commercial aspects of nanotechnology.
12. a) Briefly explain the structure of nanoparticles.
    (OR)
    b) Briefly explain the reduction size of nanoparticles.
13. a) How are cadmium telluride nano crystals prepared? Explain.
    (OR)
    b) How are cadmium sulphide nanocrystals prepared? Explain.
14. a) Discuss about nanostructured absorbents briefly.
    (OR)
    b) What do you know about quantum dots?
15. a) In what way nano crystals are useful in colourants and pigments?
    (OR)
    b) Write the importance of nanocrystals in the field of magnetics and electronics.

SECTION – C

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

16. a) What do know about nanoscience and nanoparticles? **(4 + 6)**
    b) What are the relationship between chemistry and solid state physics.
17. Discuss about synthesis of metal nanoparticles by various methods.
18. Write a short note on semiconducting nanoparticles.
19. Discuss the chemical reagents and catalytic aspects of nanocrystals.
20. What are the biomedical applications of nanocrystals?

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST
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B.A. / B.Sc. Degree (Semester) Examinations, April 2015
Part – IV : Non-Major Elective Subject : Second Semester : Paper – I

MEDICINAL CHEMISTRY-VACCINE PREVENTABLE DISEASES
Under CBCS – Credit 2

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

SECTION – A

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

1. _____ is used as operating fluid for refrigerators.
   a) Xenon b) Freon c) Neon d) Baygon
2. Penicilline was discovered by _____.
   a) Alexander fleming b) Paul Erlich
   c) Wakes mann d) Fisher
3. Cholera is a _____ disease.
   a) Water borne b) Air borne
   c) Water and Air borne d)none of these
4. _____ is used as antiknocking reagent.
   a) TEL b) RDX c) FAS d) None
5. The incubation period of typhoid is
   a) 10-20 days b) 4 – 8 days c) 12 – 18 days d) 28days
6. What is meant by Medicinal chemistry?
7. Write the symptoms of Hapatitis?
8. Which Mosquito speard dengue?
9. Define active site in enzyme catalysis.
10. Distinguish the word Ingestion and Intravenous.

SECTION – B

Answer ALL Questions : **(4 × 10 = 40)**

11. a) What are enzymes? Describe their classification and nomenclature?

(OR)

b) What are the phases involved in getting a drug to the market?

12. a) Discuss in detail the epidemiology, preventive measures of Mumps. Give the vaccine to Cure the disease.

(OR)

b) Explain the source, symptoms and prevention measurements of Hapatitis.

13. a) Write note on cholera.

(OR)

b) Explain the following i) Vaccine preparation method
ii) Duties of modern Epidemiologists

14. a) Discuss the term "Antisense therapy".

(OR)

b) Write a note on cardiovascular drugs.

SECTION – C

Answer any TWO Questions : **(2 × 12½ = 25)**

15. What is a disease? Describe classification of Human disease.
16. Describe the clinical features, prevention and control of Typhoid.
17. Illustrate briefly about chemical messenger.

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07SB4A

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST
(Autonomous & Residential)
[Affiliated to Madurai Kamaraj University]
B.Sc. Chemistry Degree (Semester) Examinations, April 2015
Part – IV : Skill Based Subject : Fourth Semester : Paper – I

CHEMISTRY IN ACTION
Under CBCS – Credit 2

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

SECTION – A

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

1. Which one among the following is used as an anti cancer drug
   a) Insulin b) Cis-platin c) Trans-platin d) Penicillin
2. Which of the following is liquid element
   a) Bromine b) Oxygen c) Fluorine d) Nitrogen
3. The isotope which is used to determine the age of rock
   a) ^{15}N b) ^{18}O c) ^{14}C d) ^{131}I
4. Marsh's Test is used to detect _____ metal.
   a) AS b) Mg c) Ag d) Au
5. The metal which is responsible for Napoleon's death
   a) Cd b) As c) Cr d) Au
6. Mention the important elements for Plant growth.
7. Write the expansion of LASER.
8. What is desalination process?
9. What is antacid?
10. Who Killed Napoleon?

SECTION – B

Answer ALL Questions : **(4 × 10 = 40)**

11. a) Discuss the essential elements and its importance to human body?
    (OR)
    b) Discuss instrumentation and function of Breathalyzer.

12. a) Write a short notes on discovery of the Nobel gases?
    (OR)
    b) Write a note on microwave oven and its working principles.

13. a) How will you prepare NH_3 by Haber process?
    (OR)
    b) Give the importance of femto chemistry.

14. a) How will produce electrical energy using bacteria power?
    (OR)
    b) Write short notes on decaying papers.

SECTION – C

Answer any TWO Questions : **(2 × 12½ = 25)**

15. i) Discuss the evidences of the Big bang theory.
    ii) What is the reason for precipitation of $CaCo_3$ in pipes and boiler? How will you remove it?

16. i) Write a short note on ruby laser
    ii) Define high temperature in super conductor.

17. i) How the hemoglobin is affected at high altitude?
    ii) Discuss the action of cisplatin an anticancer drug.

✦✦✦✦✦

31. Benzene diazonium chloride is treated with copper powder to give chlorobenzene. This reaction is called
a) Sandmayer reaction b) Carbylamine reaction
c) Scotten-Baumann reaction d) Gattermann reaction

32. Chloropicrin is
a) CCl_3NOH b) CCl_3N_2Cl c) CCl_3NH_2 d) CCl_3NO_2

33. Lassaigne's test is used to identify
a) nitrogen b) sulhur c) halogen d) all the above

34. Soaps are
a) sodium salt of lower fatty acids
b) sodium salt of higher fatty acids
c) sodium salt of alcohols d) all the above

35. Pyrrole is
a) acidic b) basic c) very weak acidic d) very week basic

36. Proteins are not arranged along one axis but irregularly. This structure is
a) primary b) secondary c) tertiary d) quaternary

37. The important colour test for identification of amino acid involves the use of
a) Fehling's solution b) Nessler's reagent
c) Ninhydrin test d) Benedict's test

38. Mutarotation is
a) change of physical properties b) change of chemical properties
c) change of optical rotation d) all the above

39. Which isomers rotate plane polarized light?
a) geometrical isomers b) position isomers
c) optical isomers d) functional isomers

40. The most stable form of cyclohexane is
a) boat b) twist c) chair d) gouche

41. Which one of the following is antibiotic
a) aspirin b) paracetamol c) ether d) penicillin

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B.Sc. Chemistry Degree (Semester) Examinations, April 2015
Part – IV : Skill Based Subject : Sixth Semester : Paper – I

CHEMISTRY FOR COMPETITIVE EXAMINATIONS
Under CBCS – Credit 2

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

SECTION – A

Answer ALL Questions : **(75 × 1 = 75)**

1. Which is an electrolyte?
a) $AgNO_3$ solution b) ethanol c) mercury d) sugar

2. The indicator used in iodimetry?
a) methyl blue b) phenolphthalein c) starch c) KI

3. Example for one component system
a) Pb-Ag system b) Mg-Zn system
c) water system d) all these above

4. Chemical kinetics is the
a) study of equilibrium reaction
b) study of rate of chemical reaction
c) study of homogenous reaction
d) study of heterogeneous reaction

5. Rate of reaction does not depend on
a) concentration of reactants b) products
c) temperature d) molecularity

6. Example for intensive property
a) mass b) volume c) energy d) temperature

7. Second law of thermodynamics is
a) the entropy of pure substance is zero at the absolute zero of temperature b) all spontaneous processes are irreversible
c) although energy may be converted from one another it cannot be created or destroyed d) all the above

8. Generally polar substances dissolves in
   a) non polar solvent b) polar solvent
   c) both of the above d) none of the above

9. Emulsion is
   a) gas dispersed in a liquid b) solid dispersed in a gas
   c) solid dispersed in a soild d) liquid dispersed in a liquid

10. Joblonski diagram is useful for explaining
    a) fluorescence b) phosphorescence
    c) both a and b d) none of the above

11. Schrodinger gave wave equation to describe the behaviour of _____ waves in atoms and molecules.
    a) neutron b) electron c) proton d) all the above

12. An orbital cannot contain more than two electrons. This is based on
    a) Hund's rule b) aufbau principle
    c) Pauli exclusion principle d) None of the above

13. The bond angle in CH_4 molecule is
    a) 107° b) 109.5° c) 104° d) 100°

14. Bragg's equation is
    a) $n= 2n \sin \theta$ b) $n\lambda= 2d \sin \theta$ c) $\lambda= 2d \sin \theta$ d) $2d \sin \theta = n$

15. The structure of CsCl crystal is
    a) face centred cubic lattice b) body centred cubic lattice
    c) simple cubic d) none of the above

16. Which of the following has zero dipole moment
    a) CCl_4 b) CH_3Cl c) HF d) $CHCl_3$

17. The f orbital contains _____ number of electrons.
    a) 2 b) 8 c) 10 d) 14

18. When l=0, the shape of orbital is
    a) dumb-bell b) spherical c) circle d) elliptical

19. Example for strong electrolyte is
    a) HCl b) CH_3COOH c) NH_4OH d) none of the above

20. Example of buffer solution is
    a) acetic acid+ sodium acetate
    b) carbonic acid+ sodium carbonate
    c) citric acid+ sodium citrate d) all the above

21. The principle involved in atomic bomb is
    a) nuclear fission b) nuclear fusion
    c) stellar energy d) addition

22. The metal atom present in chlorophyll is
    a) Ca b) Fe c) Hg d) Mg

23. Most oxygen carried in the blood is:
    a) In solution with the plasma
    b) Combined with plasma proteins
    c) Chemically combined with a heme group
    d) Carried as HCO_3^-

24. The metal ion present in vitamin B12 is
    a) Magnesium b) Cobalt c) Iron d) Zinc

25. Formaldehyde reacts with Grignard reagent to give
    a) 1° alcohol b) 2° alcohol c) 3° alcohol d) all the above

26. Allyl alcohol is
    a) $CH_2OH-CH=CH_3$ b) $CH_2=CH-CH_2OH$
    c) $CH_2=CHOH-CH_3$ d) $CH_2-CH=CH_3$

27. In Reimer Tiemann reaction catalyst is
    a) CCl_4 and Base b) $LiAlH_4$ and Base
    c) $CHCl_3$ and Base d) $NaBiO_3$ and Base

28. Williamson's synthesis is used to prepare
    a) aldehyde b) ketone c) ether d) polyester

29. Nitrobenzene is reduced with zinc and alkali it gives
    a) aniline b) phenyl hydroxylamine
    c) p-aminophenol d) hydrazobenzene

30. Hinsberg's reagent is
    a) C_6H_5Cl b) C_6H_5MgCl c) $C_6H_5SO_2Cl$ d) all the above

42. Which one of the following is antipyretic
    a) chloroform b) phenol c) paracetamol d) acetone

43. Bauxite is an ore of
    a) Al b) Fe c) Cu d) none of the above

44. The principle of GM counter is
    a) carbon dating b) nuclear reaction
    c) ionisation of gas radiation d) none of the above

45. Ionisation energy of noble gases are
    a) low b) high c) decreases d) constant

46. In column chromatography, fixed phase is
    a) solid b) liquid c) gas d) all the above

47. It is an effect due to which the absorption maximum is shifted towards longer wavelength due to the presence of auxochrome or by the charge of solvent. This is called
    a) hypsochromic shift b) bathochromic shift
    c) hyperchromic shift c) hypochromic shift

48. Which one of the compound is taken as reference in NMR?
    a) benzene b) carbon tetrachloride
    c) tetramethyl silane d) all the above

49. Water soluble vitamin is
    a) vitamin A b) vitamin B c) vitamin K d) vitamin D

50. Male reproductive hormone is
    a) progesterone b) testosterone c) estradiol d) all the above

51. DDT is prepared from
    a) toluene + Cl_2 b) Chlorobenzene + Chloral
    c) Benzene + $CHCl_3$ d) none of the above

52. de Broglie equation is
    a) $\lambda = h/mv$ b) $\lambda = mv/h$ c) $\lambda = hmv$ d) $\lambda = hv/m$

53. The orbital with n=3 and l=2 is
    a) 3s b) 3p c) 3d d) 3f

54. The axial overlap between two orbitals leads to the formation of a
a) sigma bond b) pi bond c) multiple bond d) none of these

55. In H_2O, NH_3 and CH_4 molecules the oxygen, nitrogen and carbon atoms are
a) sp^3 hybridized
b) sp^3, sp^2 and sp respectively
c) sp, sp^2 and sp^3 respectively
d) sp^2 hybridized

56. The increasing bond order in the species O_2^-, O_2^+ and O_2^{2-}
a) $O_2^{2-} < O_2^+ < O_2^-$
b) $O_2^- < O_2^{2-} < O_2^+$
c) $O_2^{2-} < O_2^- < O_2^+$
d) $O_2^+ < O_2^- < O_2^{2-}$

57. Which among the following pairs are paramagnetic
a) O_2 and N_2 b) O_2 and CO c) O_2 and NO d) CO and NO

58. Ionic radii of alkali metal ions in water are in the order
a) $Li^+ > Na^+ > K^+ > Rb^+$
b) $Li^+ < Na^+ < K^+ < Rb^+$
c) $Li^+ > Na^+ > K^+ < Rb^+$
d) $Li^+ > Na^+ < K^+ < Rb^+$

59. The maximum number of electrons that can be accommodated in an orbit is
a) 2n b) n^2 c) $2n^2$ d) 2n + 1

60. Which one of the following is Lewis acid
a) BCl_3 b) NH_3 c) H_2O d) CN^-

61. Huckel rule is
a) (4n+1) π electrons
b) (4n+1) σ electrons
c) (4n+2) π electrons
d) (4n+1) σ electrons

62. Which of the following is neutral electrophile?
a) NO_2^+ b) $AlCl_3$ c) H^+ d) Cl^-

63. Reactions which involve the migration the functional group from one postion to another position is called
a) Rearrangement b) elimination c) substitution d) addition

64. Heterolysis of C-Cl bond produces
a) two carbanions
b) two carbonium ions
c) two free radicals
d)one cation and one anion

65. Which of the following is more stable stable carbocation?
a) primary b) secondary c) tertiary d) carbonium ion

66. Which of the following does not obey EAN rule?
a) $[Cu(CN)_4]^{3-}$ b) $[Pt(NH_3)_4]^{2+}$ c) $[Pd(NH_3)_6]^{4+}$ d) $[Cr(CO)_6]$

67. Which of the following exhibits geometrical isomerism?
a) $[Cr(en)_2Cl_2]^+$
b) $[Cr(NH_3)_6]$ $[Co(CN)_6]$
c) $[Co(NH_3)_4(NO_2)Cl]^+$
d) $[Co(NH_3)_6]Cl_3$

68. Which of the following ligand is bidentate
a) EDTA b) ethylenediamine c) acetate d) pyridine

69. Which of the following ion is not expected to be coloured?
a) Mn(II) b) Fe(III) c) Ti(III) d) Cu(I)

70. The expected magnetic moment of Ti(III) ion is
a) 4.90 b) 2.84 c) 1.73 d) 0

71. The CFSE of d^{10} is
a) 0 Δ_0 b) $2\Delta_0$ c)3 Δ_0 d) $4\Delta_0$

72. Alkali metals dissolve in liquid ammonia to form blue colour. The blue colour is due to
a) alkali metals
b) alkali metal ion
c) ammoniated electron
d) ammoniated alkali metal ion

73. A cyclotron is used to get
a) energetic ions b) positrons c) magnetic fields d) neutrons

74. Pyridine reacts with mixture of KNO_3 and H_2SO_4 at 300°C to give
a) 1-nitropyridine
b) 2-nitropyridine
c) 3-nitropyridine
d) 4-nitropyridine

75. An beta particle is
a) One electron
b) one neutron and one proton
c) two proton and two neutrons
d) an X ray emission

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07SB6F

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST
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B.Sc. Chemistry Degree (Semester) Examinations, April 2015
Part – IV : Skill Based Subject : Sixth Semester : Paper – I

ANALYTICAL METHODS IN CHEMISTRY
Under CBCS – Credit 2

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

SECTION – A

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

1. Analytical methods are better than conventional methods
   a) False b) true c) nearly true
   d) all the above three answers are not correct
2. Column chromatography separates molecules according to their
   a) Molecular size b) Solubility c) Polarity d) Matrix
3. Which of the following has the highest energy per photon?
   a) radiowaves b) ultraviolet c) infrared d) microwave
4. The technique in which one measures and interprets the current that flows at working electrode as the potential of the working electrode is varied in a triangular fashion is called
   a) cyclic voltammetry b) potentiometry
   c) pH measurement d) controlled-potential coulomtery
5. Which of the following statements is TRUE
   a) All molecules that absorb light are fluorescent
   b) All molecules that are fluorescent absorb light
   c) Fluorescent molecules have a quantum yield equal to 1.0
   d) All aromatic molecules are fluorescent
6. Define elution.
7. What is meant by oxidation potential?
8. Write the sources of uv radiation in UV -vis spectrophotometer.
9. Define molar Molar absorptivity.
10. What do you mean by fluorescence?

SECTION – B

Answer ALL Questions : **(4 × 10 = 40)**

11. a) How analytical technique can be used in quantitative and qualitative analysis?

(OR)

b) How column chromatography is used in the separation of organic compound mixtures?

12. a) How will you determine the concentration of ferrous ion using UV spectroscopy?

(OR)

b) Derive the equation for Beer – Lambert's law. Identify the factors that cause the deviation of Beer – Lambert's law from linearity.

13. a) How can you identify the reversible, irreversible and quasi reversible electrochemical processes in cyclic voltammetric technique?

(OR)

b) Discuss the application of TLC.

14. a) How the scan rate affect the current density in cyclic voltammogram. Describe the application of cyclic voltammetry.

(OR)

b) How the concentration of species will affect the fluorescence intensity.

SECTION – C

Answer any TWO Questions : **(2 × 12½ = 25)**

15. Discuss the principles and instrumentation of cyclic voltammetry technique.
16. Define R_f factor. How is it useful in identifying and separating the components of mixture?
17. i) Write a note on absorption spectroscopy.
    ii) Describe the applications of fluorescence spectroscopy.

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