07AT02

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST
(Autonomous & Residential)
[Affiliated to Madurai Kamaraj University]
B.Sc. Botany/Zoology Degree (Semester) Examinations, April 2018
Part – III : Core Subject : Second Semester : Paper – II

INORGANIC ORGANIC & PHYSICAL CHEMISTRY - II
Under CBCS – Credit 4

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

SECTION – A

Answer ALL Questions: (10 × 1 = 10)

1. The pH value of neutral solution is

   a) 4 b) 5 c) 6 d) 7

2. Which of the following is a synthetic compound

   a) Rotenone b) Malathion c) Neem oil d) Nictoin

3. The isoelectric point of glycine is

   a) 7.9 b) 5.5 c) 6.1 d) 9.2

4. Which of the following is ionic compound

   a) NaCl b) H_2 c) F_2 d) Cl_2

5. The major component of air is

   a) Water vapour b) Oxygen c) Nitrogen d) Argon

6. BF_3 is Lewis acid. Comment.

7. What is insecticide?

8. Write any two properties of amino acids.

9. What is ionic bond?

10. Give the expansion of CFC.

SECTION – B

Answer ALL Questions: (5 × 7 = 35)

11. a) Explain Usinovich concept of acid and base.

    (OR)

    b) Write short notes on i) Lux-Flood concept
    ii) Cady-Elsey conept

12. a) Explain in detail safe handling of pesticides.

    (OR)

    b) Write short notes on impact of pesticides on environment.

13. a) Write Gabriel – phthalimide synthesis of amino acids.

    (OR)

    b) What are polypeptides? Explain.

14. a) Discuss hydrogen bonding and its types.

    (OR)

    b) What is covalent bond write its properties?

15. a) Write a note on ozone depletion.

    (OR)

    b) Discuss the effects of air pollutants.

SECTION – C

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

16. Write short note on i) Arrhenius concept of acid and bases
    ii) Bronsted –Lowry concept.

17. Explain in detail the compounds of copper as fungicide.

18. What are proteins? Discuss the classification with example.

19. Explain Born-Haber cycle.

20. Write a note on different sources of water pollution.

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST
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B.Sc. Physics Degree (Semester) Examinations, April 2018
Part – III : Allied Subject : Second Semester : Paper – II

INORGANIC ORGANIC & PHYSICAL CHEMISTRY - II
Under CBCS – Credit 4

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

SECTION – A

Answer ALL Questions: (10 × 1 = 10)

1. In a group from top to bottom Vander-walls radii
   a) Increases b) Decreases c) no change d) none of these
2. The emission of light as a result of chemical reaction is called
   a) Photochemical reaction b) Chemiluminescence
   c) Bioluminescence d) Light
3. A crystalline solid has
   a) definite geometrical shape b) sharp melting point
   c) sharp edge d) all of these
4. One Faraday is _____ Coulombs.
   a) 95000 b) 95500 c) 96000 d) 96500
5. Which among the following is used as an adsorbent in adsorption chromatography?
   a) Alumina b) Benzene c) Alcohol d) Ether
6. Name the two series that comprises f block.
7. State Grothus-Draper law.
8. Draw FCC unit cell.
9. What do you mean by redox reaction?
10. Write the principle of chromatography.

SECTION – B

Answer ALL Questions: (5 × 7 = 35)

11. a) Define and discuss the trends of ionization energy and electron affinity in the long form of periodic table.
    (OR)
    b) Define and discuss about the trends of the atomic radius and ionic radius.
12. a) Differentiate between thermal and photochemical reactions.
    (OR)
    b) Briefly explain bioluminescence with an example.
13. a) Differentiate crystalline solid and amorphous solid.
    (OR)
    b) Explain the following terms i)Unit cell ii) Interfacial angle iii) Crystal lattice.
14. a) Discuss Nernst equation for EMF of cells.
    (OR)
    b) Write a note on i) Specific conductance ii) Equivalent conductance.
15. a) Explain how chromatoplate can be prepared for T.L.C.
    (OR)
    b) Explain how column is packed for column chromatographic technique.

SECTION – C

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

16. Explain how the elements are arranged in the long form of periodic table with reference to the electronic configuration.
17. Explain the photophysical phenomena using Jablonski diagram.
18. Derive Bragg equation for diffraction of X-ray by crystal lattice.
19. Explain in detail about glass electrode along with an application of it.
20. Explain paper chromatography is an analytical tool for identification of complex mixture.

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST
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B.Sc. Chemistry Degree (Semester) Examinations, April 2018
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 axial overlap between the two orbitals leads to the formation of a
   a) Sigma bond b) pi bond
   c) multiple bond d) none of these
2. The S_N1 reaction is a _____ Process
   a) Two step process b) one step process
   c) Concerted process d) none of these
3. Rectified sprit is _____.
   a) 100% Ethanol b) 90% Ethanol
   c) 100% Methanol d) 95% Ethanol
4. Ketones react with RMgX to form an addition product which on hydrolysis gives
   a) 1^o alcohol b) 2^o alcohol c) 3^o alcohol d) ketal
5. Which of the following reagents can be used to distinguish between chlorobenzene and benzyl chloride?
   a) alcoholic $AgNO_3$ b) Br_2 in CCl_4
   c) KCN d) Br_2 in H_2O
6. Abbrevate VSEPR.
7. Give one use of chloroform.
8. What is the structure and IUPAC name of glycerol?
9. Complete the following:
   _____ + methyl magnesium iodide (followed by H^+/H_2O) $\longrightarrow$ ethyl alcohol
10. What is Freon-12?

SECTION – B

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

11. a) Write the postulates of VSEPR theory.
   (OR)
   b) Write in detail about overlapping of atomic orbitals.
12. a) Write the methods of preparation of CCl_4 and $CHCl_3$.
   (OR)
   b) Discuss the mechanism of E1 reaction.
13. a) How will you synthesize nitroglycerine and acrolein from glycerol? **(OR)**
   b) Explain the methods of preparation and properties of benzyl alcohol.
14. a) How will you prepare tetra ethyl lead (TEL) ? Give its uses.
   (OR)
   b) i) What are organometallic compounds?
   ii) Write the synthetic applications of dialkyl zinc. (2+5)
15. a) How are Westron and Freons prepared?
   (OR)
   b) Explain the preparation and properties of vinyl chloride.

SECTION – C

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

16. Explain *sp*, sp^2 and sp^3 hybridizations with the help of simple organic molecules. Indicate the shape of the molecules in each case.
17. Discuss the mechanism of S_N1 and S_N2 reactions of alkyl halides.
18. How will you prepare the following compounds from ethyl alcohol?
   i) Diethyl ether ii) Ethyl acetate iii) Methane iv) Ethylene
19. Illustrate any 5 synthetic importances of Grignard reagents.
20. Explain the preparation, properties and uses of chlorobenzene.

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B.Sc. Chemistry Degree (Semester) Examinations, April 2018
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. An alpha particle is
   a) An electron b) one neutron and one proton
   c) two protons and two neutrons d) an X- ray emission
2. A moderator in a nuclear reactor serves to
   a) accelerate neutrons b) diminish the nuclear binding energy
   c) slow neutrons d) none of these
3. A crystalline solid has
   a) Definite geometrical shape b) flat faces
   c) sharp edges d) all of these
4. The total number of atoms in a BCC unit cell is
   a) 1 b) 2 c) 3 d) 4
5. The reciprocal of viscosity is called
   a) surface tension b) frictional resistance
   c) fluidity d) none of these
6. What are magic numbers?
7. Which form of radioactivity is most penetrating?
8. Who observed the crystal lattice of substances?
9. What is Bragg's equation?
10. Which defect results in the decrease of density of crystal?

SECTION – B

Answer ALL Questions: (5 × 7 = 35)

11. a) Define: i) Binding energy ii) Mass defect
    iii) Packing fraction.
    (OR)
    b) Define the terms isotopes, isobars and isotones with example.
12. a) Distinguish nuclear fusion and nuclear fission.
    (OR)
    b) State and explain Soddy group displacement law.
13. a) Derive the law of constancy of interfacial angles and law of rational indices.
    (OR)
    b) Differentiate between isomorphism and polymorphism.
14. a) Discuss powder method of crystal analysis?
    (OR)
    b) Write note on simple cubic and BCC crystal lattices.
15. a) Write about the types of liquid crystals. Explain its applications. **(OR)**
    b) Write note on semiconductors.(n-type, p- type).

SECTION – C

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

16. Give the principle of the diffusion method for the separation of isotopes.
17. What is meant by radioactive disintegration? Derive an expression for the rate of disintegration of a radioactive material. Write its units.
18. Write about the symmetry of elements. (plane, axis and centre)
19. Derive a relationship between the interplanar spacing of a crystal and the wavelength of X-ray diffracted by it.
20. Explain Schottky and Frenkel defects with examples.

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B.Sc. Chemistry Degree (Semester) Examinations, April 2018
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. Pthalic acid belongs to _____.
   a) Mono carboxylic acid b) Di-carboxylic acid
   c) Mono chloro carboxylic acid d) None
2. CH_3-CO-CH_2-COOH, Name of the compound is
   a) Acetoacetic acid b) Ethyl acetate
   c) Acetone d) All the above
3. The molecular formula of glucose is
   a) $C_6H_{12}O_3$ b) $C_{12}H_{24}O_{12}$ c) $C_6H_{12}O_6$ d) None of the above
4. A substance said to be paramagnetic when
   a) $\mu>1$ b) $\mu<1$ c) $\mu=1$ d) Always
5. The mobile phase in liquid chromatography is _____.
   a) liquid b) gas c) solid d) Plasma
6. Give any one of the preparation of monochloro acetic acid.
7. Give any one of the preparation of glyoxalic acid.
8. State epimerization.
9. What is surface tension?
10. Write the principle of chromatography.

SECTION – B

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

11. a) Write the preparation and properties of alanine.
    (OR)
    b) Write the preparation and properties of acetic acid.
12. a) Give the mechanism in the synthesis of acetoacetic ester.
    (OR)
    b) What is tautomerism? Give one example and discuss this phenomenon in detail.
13. a) Write the conversion of fructose to glucose.
    (OR)
    b) What are the applications of cellulose derivatives?
14. a) Discuss in detail about parachor.
    (OR)
    b) How will you calculate the dipole moment using the ionic character?
15. a) Write short note on solvent extraction.
    (OR)
    b) State and explain Parke's process.

SECTION – C

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

16. Give in detail the action of heat on α, β, γ - hydroxy acids.
17. Discuss any four synthetic applications of malonic ester.
18. Describe the preparation, properties and structure of sucrose.
19. Explain the following terms i) Dunstan rule
    ii) molar refraction iii) para magnetism iv) diamagnetism
20. Explain in detail about Nernst distribution law and its limitations.

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B.Sc. Chemistry Degree (Semester) Examinations, April 2018
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. Felspars are silicates in which Si^{4+} is partly replaced by _____ in the tetratedron position.
   a) Fe^{3+} b) Ba^{2+} c) Al^{3+} d) Cu^{2+}
2. Bleaching powder reacts with a few drops of conc. HCl to give _____.
   a) O_2 b) CaO c) HClO d) Cl_2
3. Of the given anions, the strongest Bronsted base is
   a) ClO_4^- b) ClO_3^- c) ClO_2^- d) ClO^-
4. Which one of the following is an anthraquinone dye?
   a) Eosin b) Alizarin c) Congo red d) Bismark brown
5. In the given reaction
   $B_2H_6 \xrightarrow[298K]{Cl_2} [\times]$ $[\times]$ will be
   a) B_2H_5Cl b) B_2H_4Cl c) BCl_3 d) BCl_2
6. What are silicones?
7. What are polyhalides?
8. What are Lewis bases?
9. What is Magneson reagent?
10. What are electron deficient compounds?

SECTION – B

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

11. a) Discuss the important properties and uses of silicones?

(OR)

b) Write notes on (i) Zeolites (ii) Ultramarine. (3.5+3.5)

12. a) Give a detailed account of the interhalogen compounds with special reference to the compounds involving iodine.

(OR)

b) Why does fluorine differ from the rest of the family members? Bring out the main points of difference.

13. a) Describe any three types of reactions in liquid ammonia as a solvent. **(OR)**

b) Explain HSAB principle. Discuss its applications.

14. a) Narrate the advantages and disadvantages of organic reagents in inorganic analysis. **(OR)**

b) Give an account of the following:

i) Uranyl zinc acetate ii) Rhodamine – B (3.5+3.5)

15. a) Describe any four general methods of preparation of boranes.

(OR)

b) i) Write down the structure of the following:

(I) Pentaborane – 11

(II) Hexaborane – 10

(III) Decaborane – 14 (1.5+1.5+1.0)

ii) Write a note on Wades rule. (3)

SECTION – C

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

16. Classify silicates into different types. Gives the composition and structure of each type of silicate.

17. a) What are pseudohalogens? Why are they so called? Describe the important characteristics of pseudohalogens. **(7)**

b) Write a brief note on basic iodine. **(3)**

18. a) What is symbiosis? Give examples. What are its applications? **(6)**

b) Give a brief account of types of non aqueous solvents. **(4)**

19. Describe in detail the estimations of magnesium and nickel using EDTA.

20. Discuss in detail the bridge structure of diborane. Bring out clearly the nature of bonds in hydrogen bridges.

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B.Sc. Chemistry Degree (Semester) Examinations, April 2018

Part – III : Core Subject : Sixth Semester : Paper – I

ORGANIC CHEMISTRY - III

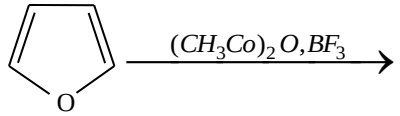
Under CBCS – Credit 4

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

SECTION – A

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

1. Natural rubber is a polymer of
   a) Ethylene b) Isoprene c) 1,4-Butadiene d) Acrylic acid
2. Which one of the following is a vat dye?
   a) Martius yellow b) Malachite green
   c) Indigo d) Alizarin
3. Which one of the following is not a five membered heterocyclic compound?
   a) Thiophene b) Furan c) Pyridine d) Pyrrole
4. Which one of the following disease is caused by the deficiency of vitamin-c?
   a) xerophthalmea b) Beriberi
   c) Rickets d) Scurvy
5. Which one of the following region in IR is known as functional group region?
   a) 650 – 900 cm^{-1} b) 900 – 1300 cm^{-1}
   c) 1300 – 4000 cm^{-1} d) None of these
6. What does the word polymer mean?
7. What are auxochromes? Give an example.
8. Write the product of the following reaction.



9. What is isoprene rule?
10. What is chemical shift?

SECTION – B

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

11. a) i) What are thermo and thermosetting polymers? Give examples. **(5)**
    ii) How is Nylon 66 prepared? **(2)**

(OR)

b) Describe the biomedical applications of polymers.

12. a) Discuss briefly the relationship between colour and chemical constitution. Explain on the basis of valence bond theory.

(OR)

b) i) How are alizarin and fluorescein synthesised? **(5)**
ii) N - substituted amides, R - CO - NHR, do not undergo Hofmann rearrangement. Why? **(2)**

13. a) How will you synthesis isoquinoline? Give its resonance structures. What are the oxidation products of isoquinoline?

(OR)

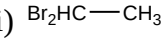
b) Outline the synthesis of
i) Indole ii) Piperine **(3.5+3.5)**

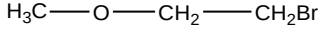
14. a) Give the synthesis of citral from acetone and acetylene.

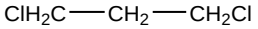
(OR)

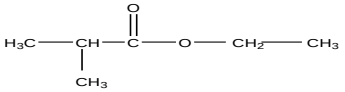
b) Describe the applications of the following drugs.
i) Sulphanilamide ii) Sulphathiazole **(3.5+3.5)**

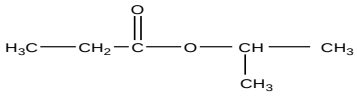
15. a) Predict the splitting patterns you would expect for each proton in the following molecules.

i) 

ii) 

iii) 

iv) 

v) 

(OR)

b) Describe briefly the factors influencing chemical shift.

SECTION – C

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

16. a) Discuss the mechanism of free radical polymerization.

    b) Write notes on conducting polymers. **(5+5)**

17. Describe the mechanism of the following rearrangements.

    a) Benzilic acid rearrangement.

    b) Fries rearrangement.

    c) Wagner – Meerwein rearrangement.

    d) Orton rearrangement **(4×2.5 = 10)**

18. Give the structural elucidation of coniine.

19. Narrate the biological importance of the following:

    a) Thyroxine b) Thiamine

    c) Testosterone d) Progesterone **(4×2.5 = 10)**

20. a) Explain the electronic transitions in the UV region.

    b) Write a short note on finger print region.

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B.Sc. Chemistry Degree (Semester) Examinations, April 2018
Part – III : Core Subject : Six 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. $2HI \rightarrow H_2 + I_2$ is _____.
   a) unimolecular b) bimolecular
   c) trimolecular d) tetramolecular
2. The plane of symmetry is represent as _____.
   a) σ b) E c) C_n d) φ
3. The rotational spectra of molecule are observed in the _____.
   a) IR region b) microwave region
   c) UV region d) visible region
4. The Raman spectroscopy deals with _____.
   a) absorption b) emission
   c) the scattering of light d) none of these
5. How many equivalent protons present in TMS?
   a) 4 b) 8 c)10 d) 12
6. What is meant by order of reaction?
7. Define point group.
8. What is emission spectrum?
9. Why do not show IR spectra for homonuclear diatomic molecules?
10. Define isotopic peaks.

SECTION – B

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

11. a) Derive an expression for the first order rate constant and half life period of a reaction. **(OR)**
    b) How will you determine order of a reaction?
12. a) Write short notes on (i) Symmetry elements (ii) Symmetry operation (iii) centre of inversion
    (OR)
    b) Define the following terms
    i) Abelian and non-a belian group (ii) Order of the group iii) cyclic group
13. a) Explain the following terms i) Absorption spectra ii) Band spectra iii) Rotational spectra
    (OR)
    b) What are different types of molecular spectra?
14. a) Discuss about the IR spectra of diatomic molecule.
    (OR)
    b) Distinguish between Raman and IR spectra.
15. a) Describe the NMR spectrum of ethanol.
    (OR)
    b) Write detailed notes on nitrogen rule and Mc Lafferty rearrangement.

SECTION – C

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

16. Explain the collision theory for unimolcular reaction.
17. Discuss diagrammatically the point groups for water and ammonia.
18. Prove that for a rigid diatomic rotor the moment of inertia is given by $I=\mu r^2$.
19. Explain the rotation-vibration spectra of diatomic molecules.
20. Sketch and explain the hyperfine splitting of ESR spectrum of hydrogen and methyl radical.

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B.Sc. Chemistry Degree (Semester) Examinations, April 2018
Part – III : Elective Subject : Sixth Semester : Paper – II

NANOCHEMISTRY
Under CBCS – Credit 5

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

SECTION – A

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

1. Which lenses are used in electron microscopes?
   a) Glass lenses b) electromagnetic lenses
   c) fibre glass lenses d) none of these
2. TOPO stands for
   a) Trioctylphosphine oxalate b) Trioctylphosphine oxide
   c) Trioctylphosphine d) Trioctylphosphine selenide
3. The combination of surface science and molecular biology are called as _____.
   a) biotechnology b) nanochemistry
   c) nanobiology d) surface
4. The silicon nanowires can act as _____.
   a) superconductor b) gas sensor
   c) reducing agent d) photocatalyst
5. Surface plasmon band of gold nanoparticle appears at _____ nm in UV-vis spectroscopy.
   a) 300-400 b) 400-500 c) 500-700 d) 700-900
6. What is transmitting?
7. Define quantum dots.
8. Write any two examples of magnetic nanoparticles.
9. What is sensor?
10. Define tectodendrimers.

SECTION – B

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

11. a) Give the outline of electronic microscopies.
    (OR)
    b) List out the difference between nanotechnology and biology.
12. a) Write a note on molecular precursors.
    (OR)
    b) Describe the electronic structure of nanocrystals.
13. a) Discuss the interaction nanoparticles with conjugate biomolecules. **(OR)**
    b) Write the advantages of noble metal nanoparticles.
14. a) What is the role of cyclic voltammograms in nanosensor?
    (OR)
    b) Discuss the responsibility of nanosensor in future.
15. a) Write notes on: (i) nanoshells (ii) nanopores.
    (OR)
    b) What are the advantages of gold nanoparticls in nanomedicine.

SECTION – C

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

16. Explain the detail study of transmission electron microscopy.
17. a) How will you synthesis metal selenide nanoparticles? (5)
    b) Write the uses of semiconductor nanocrystals. (5)
18. Explain the magnetic nanoparticles and its application.
19. How will you discuss the concept of nano-biosensors?
20. Discuss the properties of nanoparticles useful for therapeutic applications?

07NE21

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential)

[Affiliated to Madurai Kamaraj University]

B.A./B.Sc./B. Com. Degree (Semester) Examinations, April 2018

Part – IV : NME 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. The cure and treatment of diarrhoea is
   a) Oral Re-hydration salts solution b) Antibiotic drugs
   c) chelating therapy d) chemotherapy
2. The risk factors for types 2 diabetes mellitus include_____.
   a) All of the options listed are correct
   b) being a member of a high-risk population
   c) being overweight d) family history
3. Having a high blood glucose level is called
   a) hypoglycemia b) diabetic ketoacidosis
   c) hyperglycemia d) macrosomia
4. 75 to 90 mm of mercury is an adults normal
   a) systolic pressure b) diastolic pressure
   c) peristalsis pressure d) water pressure
5. Drug is
   a) produced by endocrine glands b) produced by exocrine glands
   c) are secreted through pituitary gland
   d) are externally administered chemical substances

Give Short Answer:

6. Write any two symptoms of Water borne disease.
7. What is mean by enzymes?
8. How to control hypertension?
9. Write any two controlling process of TB.
10. What is mean by MMR?

SECTION – B

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

11. a) Write note on Insect and Air borne disease.

(OR)

b) Explain the following terms: (a) Pharmacology
(b) Pharmacognosy (c) Pharmacodynamics (d) Pharmacokinetics

12. a) Discuss the symptoms, prevention and control of Mumps.

(OR)

b) Write note on Rubell.

13. a) Discuss clinical feature, prevention and control of Cholera.

(OR)

b) Discuss clinical feature, prevention and control of Typhoid.

14. a) Write note on causes of Diabetes, hyper and hypoglycemic drugs.

(OR)

b) Write note on cardio vascular drugs.

SECTION – C

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

15. Discuss in detail any two hereditary diseases.
16. Define the following terms: (a) Enzymes (b) receptors
(c) carrier protein (d) nucleic acid
17. Write note on Blood pressure.

07SB4A

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential)

[Affiliated to Madurai Kamaraj University]

B.Sc. Chemistry Degree (Semester) Examinations, April 2018

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. One nano second is
   a) 10^{-9} sec b) 10^{-12} sec c) 10^{-6} sec d) 10^{-15} sec
2. Yellow spots on citrus leaves is due to the deficiency of
   a) Boron b) Zinc c) Iron d) Magnesium
3. Theory which proclaims that an explosion created universe is called the law of gravity
   a) Big bang theory b) Darwin theory
   c) Earth theory d) none of these
4. An antidote used in mercury poisoning is
   a) Calomel b) Cis-platin c) EDTA d) None of these
5. Organic fertilizers can be derived from
   a) Animal materials b) carbon materials
   c) plant materials d) both a and c

Give Short Answers:

6. Define Microwave Oven.
7. How is an eggshell like a tooth?
8. Who discovered helium and why?
9. Is stretching a rubber band endothermic or exothermic?
10. What is the p^H level of human blood?

SECTION – B

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

11. a) How is food irradiated? Explain the advantages.

(OR)

b) Give the advantages of pressure cooking.

12. a) Write short note on decaying papers.

(OR)

b) Explain third liquid element.

13. a) Why do lakes freeze from the Top to down?

(OR)

b) Bring out the importance of sodium chloride.

14. a) Explain the anticancer activity of metal complexes.

(OR)

b) What are the chemical fertilizers? Explain the advantages.

SECTION – C

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

15. i) List the role of Fe, Mn, Mo, Cu and Zn in biological processes.

ii) Discuss the Big - Bang theory.

16. i) How do Fe and Mg differ in their physiological roles?

ii) Elucidate the structure of Hemoglobin.

17. i) Write a note on photosynthesis

ii) Explain the distribution of element on the earth and in living systems.

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B.Sc. Chemistry Degree (Semester) Examinations, April 2018

Part – IV : Skill based subject : Sixth Semester : Paper – I

CHEMISTRY FOR COMPETITIVE EXAMINATIONS

Under CBCS – Credit: 2

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

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

1. The maximum number of covalent formed by nitrogen is
   a) 1 b) 2 c) 3 d) 4
2. The metal that is usually extracted from sea water is
   a) Ca b) Na c) K d) Mg
3. The formula C_6H_5-CO-CH_3 represents
   a) Acetone b) Phenyl acetate
   c) Acetophenone d)Acetic acid
4. The inert gases are _____ in water
   a) Sparingly soluble b) insoluble
   c) soluble d) none of these
5. The molecular formula of phosphorous is
   a) P_1 b) P_2 c) P_3 d) P_4
6. The number of electrons presents in H^+ is
   a) 1 b) 2 c) 3 d) 0
7. The hottest part of the gas flame is known as
   a) Non-luminous zone b) dark zone
   c) blue zone d) luminous zone
8. The human body is made up of several chemical elements; the element present in the highest proportion (65%) in the body is
   a) Hydrogen b) Carbon c) Oxygen d) Nitrogen
9. The isomerism which exists between CH_3CHCI_2 and CH_2CI. CH_2CI is
   a) chain isomerism b) metamerism
   c) positional isomerism d) functional group isomerism
10. The metal does not give H_2 on treatment with dilute HCL is
    a) Zn b) Fe c) Ag d) Ca

11. The main active constituent of tea and coffee is
    a) nicotine b) chlorophyll c) caffeine d) aspirin
12. The hardest form of carbon is
    a) coke b) charcoal c) diamond d) graphite
13. The major constituent of air is
    a) N_2 b) O_2 c) H_2 d) CO_2
14. The main chemical constituent of clay is
    a) silicon oxide b) aluminium borosilicate
    c) zeolites d) aluminium silicate
15. The material which can be deformed permanently by heat and pressure is called a
    a) Thermoplastic b) thermoset
    c) chemical compound d) polymer
16. Which one of the following conformations of cyclohexane is chiral
    a) Twist boat b) Rigid c) Chair d) Boat
17. The ionic mobility of alkali metal ions in aqueous solution is maximum for
    a) K^+ b) Rb^+ c) Li^+ d) Na^+
18. A 5.2 molal aquose solution of methyl alchol is supplied . What is the mole fraction in the solution
    a) 0.100 b) 0.190 c) 0.086 d) 0.050
19. Which one of the following aqueous solution will exhibit highest boiling point?
    a) 0.01 M Na2SO4 b) 0.01 M KNO3
    c) 0.015 M Urea d) 0.015 M glucose
20. Which one of the following concentration factor is affected by change in temperature?
    a) Molarity b) Molality
    c) Mole Fraction d) Weight Fraction
21. Hydrogen ion concentraction in mol/L in a solution of PH =5.4 will be
    a) 3.98×10^6 b) 3.68×10^6 c) 3.88×10^6 d) 3.98×10^6
22. What is the conjucate base of OH^-
    a) O^{2-} b) O^- c) H_2O d) O_2

23. An aqueous solution of 1 M NaCl and 1 M HCl is
    a) not a buffer but PH<7 b) not a buffer but PH>7
    c) a buffer with PH<7 d) a buffer with PH>7
24. The gas leaked from a storage tank of the union carbide plant in Bhopal gas tragedy was
    a) methyl isocyanate b) Methylamine
    c) Ammonia d) Phosgene
25. What is DDT among the following?
    a) Green house gas b) A fertilizer
    c) biodegradable pollutant d) non- biodegradable pollutant
26. The smog is essentially caused by the presence of _____ gases.
    a) oxygen and ozone b) oxygen and nitrogen
    c) oxides of sulphur and nitrogen d) ozone and nitrogen
27. Identify the compound that exhibits tautomerism
    a) 2-butene b) lactic acid c) 2-pentanone d) phenol
28. The alkene that exhibits geometrical isomerism is
    a) propane b) 2- methyl propene
    c) 2-butene d) 2-methyl-2-butene
29. Nylon threads are made up of _____ polymer
    a) Polyvinyl b) polyester c) polyamide d) polyethylene
30. The reason for double helical structure of DNA is operation of?
    a) van der Waals' forces b) dipole- dipole interaction
    c) hydrogen bonding d) electrostatic attractions
31. Insulin production and its action in human body are responsible for the level of diabetes. This compound belongs to which of the following categories?
    a) A coenzyme b) A hormone
    c) An enzyme d) An antibiotic
32. Which one of the following types of drugs reduces fever
    a) Tranquiliser b) Antibiotic
    c) Antipyretic d) Analgestic
33. Which of the following could act as a propellant for rockets
    a) Liquid hydrogen+ liquid nitrogen
    b) Liquid oxygen + liquid argon
    c) Liquid oxygen+ liquid nitrogen
    d) Liquid hydrogen+ liquid oxygen

34. The structure of IF_7 is
    a) square pyramid b) Trigonal pyramid
    c) Octahedral d) Pentagonal bipyramidal

35. The number of types of bond between two atoms in calcium carbide is
    a) 1 sigma ,2 pi b) 1 sigma,1 pi
    c) 2 sigma 1pi d) 2sigma 2 pi

36. Using MO theory Predict which which of the following species has athe sharthness bond length?
    a) O_2^{2+} b) O_2^{+} c) O_2^{2-} d) O_2^{-}

37. Lattice energy of the ionic compound depends upon
    a) charge and size of the ion b) packing of ion only
    c) size of the ion only d) charge of the ion only

38. Which one of the following species is diamagnetic in nature
    a) H_2^{-} b) H_2^{+} c) H_2 d) He_2^{+}

39. Which of the following oxide is amphoteric in character?
    a) SnO_2 b) SiO_2 c) CO_2 d) CaO

40. The substance not likely to contain $CaCO_3$ is
    a) a marble statue b) Calcined gypsum
    c) sea shells d) dolomite

41. Glass is a
    a) Microcrystalline b) super cooled liquid
    c) gel d) polymeric mixture

42. Which one of the following is an amphoteric oxide
    a) ZnO b) Na_2O c) SO_2 d) B_2O_3

43. CH_3MgI is an organometallic compound due to?
    a) Mg-I bond b) C-I bond c) C-Mg bond d) C-H bond

44. Aspirin is known as
    a) acetyl salicylic acid b) phenyl salicylate
    c) acetyl salicylate d) methyl salicylic acid

45. Silver mirror test is given by which one of the following compounds?
    a) Acetaldehyde b) Acetone
    c) methanol d) Benzophenone

46. The compound formed asa result of oxidation of ethyl benzene by $KMnO_4$ is
    a) Benzophenone b) acetophenone
    c) benzoic acid d) benzyl alcohol

47. The general formula CnH_2nO_2 could be for open chain
    a) Diketones b) carboxylic acid
    c) diols d) dialdehydes

48. The frequency of light emitted for the transition=4 to n=2 of He^+ is equal to the transition in H atom corresponding to which of the following
    a) n=3 to n=1 b) n=2 to n=1 c) n=3 to n=2 d) n=4 to n=3

49. Which of the following nuclear reaction emission will generate an isotope?
    a) neutron particle b) Positron
    c) alpha particle d) beta particle

50. Consider the ground state of Cr atom. The number odf electron s with the azimuthal quantum numbers l=1 and 2 are respectively
    a) 12 and 4 b) 12and 5 c) 16 and 4 d) 16 and 5

51. The number of d-electrons retained in Fe^{2+} ion is
    a) 3 b) 4 c) 5 d) 6

52. The correct statement for the molecule CsI_3 is
    a) covalent molecule b) contains Cs^+ and I^{3-}
    c) contains Cs^{3+} and I^- d) none of these

53. Which one of the following molecule is expected to exhibit diamagnetic behaviour
    a) C_2 b) N_2 c) O_2 d)S_2

54. Aluminium is extracted by the electrolysis of
    a) alumina b) bauxite
    c) molten cryolite d) alumina mixture with molten cryolite

55. Which of the following ores is best concentrated by froth-floatation method?
    a) magnetite b) cassiterite c) galena d) malachite

56. Which of the following exists as covalent crystal in the solid state?
    a) Iodine b) Silicon c) Sulphur d) Phosphorus

57. Which of the following on thermal decomposition yields a basic as well as acidic oxides
a) $NaNO_3$ b) $KClO_3$ c) $CaCO_3$ d) NH_4NO_3

58. The type of hybridization of boron in diborane is
a) sp b) sp^2 c) sp^3 d) sp^3d^2

59. The number of hydrogen atom attached to phosphorus atom in hypophosphorous
a) 3 b) 1 c) 2 d) 0

60. Racemic mixture is formed by mixing two
a) Isomeric compounds b) chiral compounds
c) *meso* compounds d) enantiomers with chiral carbon

61. How many chiral compounds are possible on monochlorination of 2-methylbutane?
a) 8 b) 2 c) 4 d) 6

62. Iodoform canbe prepared from all except?
a) ethyl methyl ketone b) isopropyl alcohol
c) 3-methyl-2-butanone d) isobutyl alcohol

63. The reaction of toluene with Cl_2 in presence of $FeCl_3$ gives predominantly
a) benzoyl chloride b) benzyl chloride
c) o -and p- chlorotoluene d) m-chlorotoluene

64. Alkyl halide react with dialkyl copper reagents to give
a) alkenyl halide b) alkane
c) alkyl copper halides d) alkenes

65. Butene-1 may be converted to butane by reaction with
a) Zn-HCl b) Sn-HCl c) Zn-Hg d) Pd/H_2

66. Which one of the following compounds has the smallest bond angle?
a) SO_2 b) H_2O c) H_2S d) NH_3

67. Identify the correct statement regarding a spontaneous process.
a) the change in entropy is positive
b) endothermic process are never spontaneous
c) exothermic process are always spontaneous
d) lowering of energy is the only criteria for spontaneity

68. The enthalpy change for a reaction does not depends upon the
a) physical state of the reactants and products
b) use of different reactant fior the same product
c) nature of the intermediate reaction steps
d) difference in initial or final temperature of involved substance

69. Heat required to raise the temperature of I mole of a substance by 1^0 is called
a) specific heat b) molar heat capacity
c) water equivalent d) specific gravity

70. A 5.2 molal aquose solution of methyl alchol is supplied . What is the mole fraction in the solution
a) 0.100 b) 0.190 c) 0.086 d) 0.050

71. Which one of the following has a square planar geometry?
a) $[CoCl_4]^{2-}$ b) $[FeCl_4]^{2-}$ c) $[NiCl_4]^{2-}$ d) $[PtCl_4]^{2-}$

72. The value of the spin only magnetic moment for one of the following confugrations is2.84 BM. The correct one is
a) d^5 (in strong ligand field)
b) d^3 in weak as well as in strong fields
c) d^4 (in weak field) d) d^4 (in strong field ligand)

73. The lanthanide contraction is responsible for the fact that
a) Zr and Zn have the same oxidation state
b) Zr and Hf have about the same radius
c) Zr and Nb have similar oxidation state
d) Zr and Y have about the same radius

74. Which one of the following nitrates will leave behind a metal on strong heating?
a) Ferric nitrate b) Copper nitrate
c) Magnesium nitrate d) silver nitrate

75. For making good quality mirrors plates of float glass are used. These are obtained by floating molten glass over a liquid metal which does not solidify before glass. The metal used can be
a) mercury b) tin c) sodium d) magnesium

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

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B.Sc. Chemistry Degree (Semester) Examinations, April 2018

Part – IV : Skill based subject : Sixth Semester : Paper – III

ANALYTICAL METHODS IN CHEMISTRY

Under CBCS – Credit: 2

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

SECTION – A

Answer ALL Questions: (10 × 1 = 10)

1. The number of moles of solute present in 1 kg of a solvent is called its
   a) morality b) molarity c) normality d) formality
2. Beer lambert's law gives the relation between which of the following?
   a) Reflected radiation and concentration
   b) Scattered radiation and concentration
   c) Energy absorption and concentration
   d) Energy absorption and reflection radiation
3. In chromatography, the stationary phase can be _____ supported on a solid.
   a) Solid or liquid b) Liquid or gas c) Solid only d) Liquid only
4. Which of the following forms of electrochemistry seeks to obtain the condition of full polarization?
   a) potentiometry b) voltammetry
   c) coulometry d) electrogravimetry
5. To dilute a concentrated acid.
   a) add acid to the water
   b) mix both, the water and the acid, simultaneously
   c) add water to the acid
   d) never mix acid and water; the result could be quite hazardous

Give Short Answer:

6. Write any two analytical methods in chemical laboratory.
7. What is mean by R_f -value?
8. Write the formula of Beer-lambert's law.
9. What is mean by reversibility?
10. Write any two flammable and explosive chemicals?

SECTION – B

Answer ALL Questions: (4 × 10 = 40)

11. a) Write advantage and limitations of chemical methods.

(OR)

b)Write note on Instrumental method.

12. a) Explain the steps involved in TLC towards sample.

(OR)

b) Write note on importance of analytical methods in qualitative and quantitative analysis.

13. a) How will you test the reversible of CV?

(OR)

b) Write the application of CV.

14. a) Explain threshold vapour concentration, safe limits and waste disposal.

(OR)

b) Write note on simple First aid procedures for accidents involving chemical laboratory.

SECTION – C

Answer any TWO Questions: (2×12½ =25)

15. Write principle and application of Beer-Lambert's law.
16. Write principle, preparation, elution and application of column chromatography.
17. Write note on storage and handling of following chemicals with suitable example (a) corrosive (b)flammable (c) explosive (d) toxic (e) carcinogenic (f) poisonous.