07AT01

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential)

[Affiliated to Madurai Kamaraj University]

B.Sc. Botany/Zoology Degree (Semester) Examinations, November 2017

Part – III : Allied Subject : First Semester : Paper – I

INORGANIC, ORGANIC & PHYSICAL CHEMISTRY - I

Under CBCS – Credit 4

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

SECTION – A

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

1. The principle of volumetric estimation is
   a) V1 x N1÷V2 x N2 b) V1 x V2 = N1x N2
   c) V1 x N1 = V2 x N2 d) none of these
2. The unequal distribution of carbon atoms on either side of the functional group gives rise to _____
   a) Functional isomerism b) Metamerism
   c) Positional isomerism d) Tautomerism
3. Which of the following is not a nucleophile?
   a) a) BF_3 b) Cl^- c) OH^- d) NH_3
4. The shape of carbocation is
   a) Tetrahedral (b) Linear (c) Pyramidal (d) Planar
5. A catalyst will affect the rate of the forward reaction by changing the
   a) Heat of formation b) Heat of reaction
   C) Activation energy d)Potential energy of products
6. The equivalent weight of sulphuric acid is _____
7. The phenomenon in which certain organic compounds have the property of rotating plane polarised light is called _____
8. Reactions which involve the migration of the functional group from one position to another position is called _____
9. The valency of carbon atom in organic compound is _____
10. Synthesis of carbohydrate by plant using sunlight is called as _____

SECTION – B

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

11. a) What do you mean by standardisation? How will you standardise secondary standard solutions? **(OR)**
    b) Write a note on i) Molecular weight
    ii) Formula weight
    iii) Equivalent weight
12. a) Explain the molecular formula and structural formula with suitable examples. **(OR)**
    b) An organic substance contains the following percentage composition of elements. C= 18.6%; H=1.55%; Cl=55.04% and O=24.81%. Calculate its empirical formula.
13. a) Explain nucleophilic reagents and its types with examples. **(OR)**
    b) Write short notes on i) Resonance ii) Tautomerism
14. a) Write short notes on the hybridisation of carbon in methane. **(OR)**
    b) Explain with suitable examples of homolytic and heterolytic fissions.
15. a) Explain the following i) Acid-base catalysis
    ii) Catalytic poisoning iii) Catalytic promoters **(OR)**
    b) Bring out the comparison between thermal and photochemical reactions.

SECTION – C

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

16. a) Explain with examples i) Normality ii) Molarity
    b) Discuss the principle involved in titrimetry.
17. What is meant by isomerism? How is it classified? Explain structural isomerism with examples.
18. Explain the following with suitable examples
    i) Polymerisation reactions
    ii) Elimination reaction
    iii) Addition reaction
19. Discuss the formation, structure, stability of carbanions with suitable examples.
20. Describe the applications of radioactive isotopes in biology and medicine.

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

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B.Sc. Physics Degree (Semester) Examinations, November 2017

Part – III : Allied Subject : First Semester : Paper – I

INORGANIC, ORGANIC & PHYSICAL CHEMISTRY - I

Under CBCS – Credit 4

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

SECTION – A

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

1. The molecular weight of water molecule is

   a) 20 b) 28 c) 18 d) 38

2. Which of the molecule undergo sp^2 hybridization?

   a) CH_4 b) C_2H_4 c) C_2H_2 d) C_2H_6

3. The bond order of oxygen molecule is

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

4. The isotopes used in cancer treatment is

   a) Co-60 b) Na-24 c) C-12 d) N-14

5. Which one is used as an acid-base indicator?

   a) crown ether b) TNT c) BHC d) Phenolphthalein

6. The equivalent weight of NaOH is _____.

7. The mixing up of atomic orbitals is called as _____.

8. The magnetic behaviour of O_2 molecule is _____.

9. The principle behind atom bomb is _____.

10. TNT stands for _____.

SECTION – B

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

11. a) What are primary and secondary standards? Give suitable examples. What are the characteristics of primary standards?

(OR)

b) Define the following terms: i) Normality ii) Molarity iii) Equivalent of acids and bases.

12. a) What is meant by hybridization? How is it classified? Explain the sp^2 hybridization by taking a simple organic molecule.

(OR)

b) What do you mean by overlapping of atomic orbitals? Discuss the sp hybridization by taking $BeCl_2$ as an example.

13. a) Why He_2 molecule does not exist? Draw and explain the M.O diagram of hydrogen molecule.

(OR)

b) Define bonding, anti-bonding and non-bonding molecular orbitals.

14. a) i) What are composition of nucleus? Explain the stability of nucleus by using binding energy. **(5)**

ii) Define nuclear forces. **(2)**

(OR)

b) i) State and explain Soddy's group displacement law and law of radioactive disintegration. **(4)**

ii) Define mass defect. **(3)**

15. a) i) What are crown ethers? Explain their properties and uses. **(4)**

ii) Explain the preparation, properties and uses of lithium aluminium hydride. **(3)**

(OR)

b) Discuss the preparation, properties and uses of TNT and phenolphthalein.

SECTION – C

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

16. i) Explain the principle and types of titrimetry. **(7)**

ii) How can you prepare 0.1N oxalic acid solution? **(3)**

17. What are the postulates of Valence Bond theory? Explain its application.

18. Write a detailed note on MO theory and VSEPR theory.

19. i) What are nuclear fission and nuclear fusion reactions? Explain their applications. **(4)**

ii) What are the applications of radio isotopes in various fields? **(6)**

20. Explain the preparation, properties and uses of BHC, aspirin and malachite green.

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

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[Affiliated to Madurai Kamaraj University]

B.Sc. Chemistry Degree (Semester) Examinations, November 2017

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

INORGANIC AND PHYSICAL CHEMISTRY

Under CBCS – Credit 4

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

SECTION – A

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

1. Radiation from Lyman series of hydrogen spectrum associates with _____.
   a) Short wavelength b) long wavelength
   c) intermediate wavelength d) no radiation
2. The Eigen value of Eigen function, e^{2x} of operator d/dx is
   a) 0 b) 1 c) -1 d) 2
3. Which one of the following has highest ionization energy
   a) Li b) Rb c) Ne d) Ar
4. The non-elastic gel is _____.
   a) Gelatin b) silica c) agar-agar d) starch
5. The Frendlich adsorption isotherm is
   a) The variation of adsorption with pressure at a given at a constant temperature
   b) The variation of adsorption with temperature at a given at a constant pressure
   c) The variation of adsorption with volume at a given at a constant temperature
   d) The variation of adsorption with pressure at a given at a constant volume
6. The law of motion of macroscopic objects are studied by _____.
7. The radial node present in 2p orbitals is _____.
8. General electronic configuration of outermost orbital of halogens is _____.
9. Starch in water is an example of _____ system.
10. The activation energy of desorption is very low for physisorption due to the adsorbate molecules are held by comparatively _____ forces.

SECTION – B

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

11. a) Explain the following i) Photo electric effect
    ii) Heisenberg uncertainty principle

    (OR)

    b) Explain the Bohr's theory and the origin of hydrogen spectrum.
12. a) Write the postulates of quantum mechanics.

    (OR)

    b) Discuss the Zeeman effect with an example.
13. a) Explain the Born-Haber cycle for the formation of sodium chloride.

    (OR)

    b) Differentiate the ionic, covalent and metallic and hydrogen bonds with example.
14. a) Explain different types of gels and give their preparation of gels and.

    (OR)

    b) Explain the determination of molecular weight of polymer by osmotic pressure method.
15. a) Enumerate the application of adsorption.

    (OR)

    b) Explain the different types of catalysis with suitable examples.

SECTION – C

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

16. Drive the Bohr equation for energy of electron in hydrogen atom.
17. Drive the Schrödinger wave equation.
18. What is electronegativity? and how it is determined by Pauling and Mullikan's methods?
19. What is emulsion? And explain the types of emulsions with their applications.
20. Discuss the mechanism and kinetics of enzyme catalyzed reactions.

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

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B.Sc. Chemistry Degree (Semester) Examinations, November 2017

Part – III : Core Subject : First Semester : Paper – II

ORGANIC CHEMISTRY - I

Under CBCS – Credit 3

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

SECTION – A

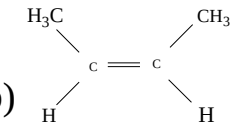
Answer ALL Questions: **(10 × 1 = 10)**

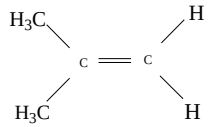
1. The IUPAC name of $H_3C\text{-}C\equiv C\text{-}CH(CH_3)_2$ is
   a) 4,4-Dimethyl - 2-pentyne
   b) 4-Methyl-2-pentyne
   c) Methyl-isopropyl acetylene
   d) 2-Methyl-4-pentyne

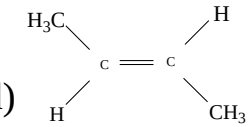
2. In which of the following p-electrons of the halogen are not involved in delocalisation?
   a) Bromobenzene b) Chlorobenzene
   c) Vinyl chloride d) Alkyl chloride

3. The compound which reacts with HBr obeying Markownikoff's rule is

   a) $CH_2=CH_2$

   b) 

   c) 

   d) 

4. Birch reduction of benzene to 1,4-cyclohexadiene is governed by __
   a) Ionic b) Free radical
   c) Both ionic and free radical d) None of these

5. In the nitration of benzene, the active species involved is
   a) nitrite ion b) nitrate ion
   c) nitronium ion d) nitrogen peroxide

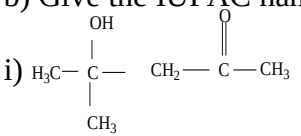
6. The common name of propanone is _____.

7. The shape of $+CH_3$ is _____.
8. Dehydrohalogenation of 2-bromobutane with alc.KOH gives mainly _____.
9. Benzene on ozonolysis gives glyoxal, methylglyoxal and dimethyl glyoxal is the ratio of _____.
10. In aromatic electrophilic substitution -Br group is _____ orienting.

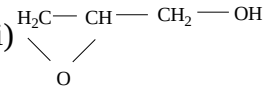
SECTION – B

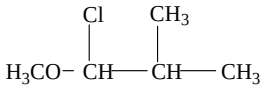
Answer ALL Questions: **(5 × 7 = 35)**

11. a) Write short notes on:
i) Chain isomerism ii) Functional isomerism. (3.5 + 3.5)
(**OR**)
b) Give the IUPAC names of the following compounds.

i) 

ii) $HOOC\text{-}CH_2\text{-}CHO$

iii) 

iv) 

v) $H_3C.CO.CO.CH_3$

12. a) Describe the stability and ease of formation of free radicals. (**OR**)
b) Discuss no bond resonance effect. Write difference between this and mesomeric effect.
13. a) Explain the mechanism of free radical substitution in methane by halogenation. (**OR**)
b) Narrate the geometrical isomerism exhibited by alkenes.
14. a) Give an account of modern theory of aromaticity. (**OR**)
b) Write short notes on:
i) Conditions for aromaticity.
ii) Resonance energy in benzene. (3.5+3.5)
15. a)i) The amino group in aniline is ortho-para directing but aniline hydrochloride is meta directing. Rationalise.
ii) Toluene is nitrated more readily than benzene. Why? (**OR**)
b) Explain why $-CF_3$ and $-NO_2$ should be deactivating and meta-directing in a typical electrophilic aromatic substitution reaction.

SECTION – C

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

16. Write short notes on:
a) Position isomerism b) Metamerism c) Tautomerism (3+3.5+3.5)
17. Write short notes on the following:
a) Addition reaction b) Rearrangement reaction
c) Inductive effect. (3.5+3.5+3)
18. a) Compare the acidity of alkynes with alkenes.
b) Write a note on peroxide effect. (5+5)
19. What is Kekule's structure of benzene? What are the limitations of Kekule's structure? How is the structure modified by modern concept?
20. Discuss the mechanism of electrophilic substitution in the case of benzene for the following:
a) Sulphonation b) Friedel-Craft's acylation
c) Chlorination (4+3+3)

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

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B.Sc. Chemistry Degree (Semester) Examinations, November 2017

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

INORGONIC AND ORGANIC CHEMISTRY - II

Under CBCS – Credit 4

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

SECTION – A

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

1. Which one is colourless in acidic condition?
   a) Methyl orange b) $KMnO_4$
   c) Phenolphthalein d) none of these
2. Rutile is the important ore of _____ metal.
   a) Uranium b) Titanium c) Thorium d) Vanadium
3. Which group forms the strongest H-bond to water molecules?
   a) Alcohols b) Ethers c) Phenols d) all equally strong
4. What happens when ethyl iodide is treated with KSH
   a) Methanethiol b) Ethanaethiol
   c) Diethyl ether d) Propanone
5. Benzaldehyde does not react with
   a) phenylhydrazine b) Fehling's solution
   c) Tollens' reagent d) $NaHSO_3$
6. Define Molality.
7. What do you mean by mineral?
8. How is catechol prepared?
9. Write any two applications of diethyl ether.
10. How will you synthesize cinnamaldehyde ?

SECTION – B

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

11. a) How will you prepare standard solutions? How do standardising a secondary standard solution?

    (OR)

    b) Describe the types of indicators used in acid-base titrations.
12. a) Describe the forth flotation technique as applied to metallurgy.

    (OR)

    b) Write a note on Van-Arkel method.
13. a) Explain the preparation and properties of resorcinol.

    (OR)

    b) Give an account on acidity of phenols.
14. a) Write short notes on the comparison of ether and alcohols.

    (OR)

    b) Describe the preparation and properties of ethyl mercaptan.
15. a) Describe the preparation and properties of ethyl methyl ketone.

    (OR)

    b) How are the following compounds obtained?
    (i) acrolein (ii) glycolaldehyde (iii) benzophenone

SECTION – C

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

16. Explain the different types of titrations.
17. What are the chief ores of vanadium? How is vanadium extracted and purified?
18. What happens when
    i) chlorobenzene is treated with nitric acid, sulphuric acid and NaOH.
    ii) Phenol is treated with alkaline solution of $C_6H_5\overset{\oplus}{N}_2\overset{\ominus}{Cl}$
    iii) Naphthalene undergoes reduction with sodium and ethanol.
    iv) Anthracene undergoes oxidation with sodium dichromate and sulphuric acid.
19. Explain the preparation and properties of mustard gas and diethyl ether.
20. Give a brief account on preparation and properties of benzaldehyde.

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential)

[Affiliated to Madurai Kamaraj University]

B.Sc. Chemistry Degree (Semester) Examinations, November 2017

Part – III : Core Subject : Third Semester : Paper – II

PHYSICAL CHEMISTRY - II

Under CBCS – Credit 3

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

SECTION – A

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

1. Boyle's law mathematically expression is

   a) PV = constant b) P=1/V c) P=V d) None of these.

2. Heat capacity of solid at constant volume (C_v) is

   a) $(\partial S/\partial T)_p$ b) $(\partial H/\partial T)_p$ c) $(\partial E/\partial T)_v$ d) $(\partial G/\partial T)_s$

3. The efficiency of heat engine working between two temperatures $27^\circ C$ and $127^\circ C$ is

   a) 2 b) 1 c) 0.5 d) 0.25

4. Which of the molecules are having residual entropies at 0 K?

   a) H_2 b) D_2 c) CO d) All of them

5. _____process is the synthesis of sulphur dioxide.

   a) Haber b) Contact

   c) Brikeland – Eyde d) None

6. One mole of an ideal gas equation is _____.

7. The Joule – Thomson coefficient equation is _____.

8. The entropy of universe _____.

9. The III law of thermodynamics states that in the limit T→0, _____.

10. The unit of equilibrium constant is _____.

SECTION – B

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

11. a) Derive Maxwell – Boltzmann law of molecular velocities.

    (OR)

    b) Explain the following, i) mean free path ii) collision diameter

12. a) Deduce the relationship between Cp - Cv = R.

    (OR)

    b) State and explain the Hess's law of constant heat summation.

13. a) Write the different statements of the second law of constant heat summation. **(OR)**

    b) Derive the Gibbs – Helmholtz equation.

14. a) Illustrate the need and statement of third law of thermodynamics.

    (OR)

    b) State and explain the Nernst heat theorem.

15. a) Derive the equilibrium constant expression in terms of partial pressures. **(OR)**

    b) Apply Le-Chatelier's principle to manufacture of sulphuric acid.

SECTION – C

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

16. Discuss the postulates of kinetic theory of gases.
17. Calculate the w, q, dU and dH for the ideal gases under adiabatic condition for reversible process.
18. Deduce the efficiency of heat engine by using Carnot cycle.
19. Write note on the following, a) absolute entropy b) residual entropy.
20. Apply the Le-Chatelier's principle to

    a) Manufacture of NH_3

    b) Manufacture of nitric acid.

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential)

[Affiliated to Madurai Kamaraj University]

B.Sc. Chemistry Degree (Semester) Examinations, November 2017

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

ORGANIC CHEMISTRY - II

Under CBCS – Credit 4

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

SECTION – A

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

1. Malonic acid is heated with P_2O_5, it gives_____

   a) Acetic acid b) Carbon suboxide

   c) Butanoic acid d) None of these

2. Carbylamine test is given by

   a) 1° amine b) 2° amine c) 3° amine d) none of these

3. Which of the following formulas best represents diazomethane?

   a) $CH_2=\overset{+}{N}=\ddot{N}:^{-}$ b) $H-\ddot{N}=C=\ddot{N}-H$ c) $:\overset{-}{C}H_2-N=\overset{+}{N}:$ d) $CH_2=\overset{+}{N}=\overset{-}{N}:$

4. Optical isomers that are not mirror images are called

   a) Diasteromers b) Enantiomers

   c) Metamers d) Meso compounds

5. Which of the following is most stable conformation of cyclohexane?

   a) Chair b) Haworth c) boat d) newmann

6. Write the structure of phthalimide.

7. Methyl cyanide reacts with CH_3MgI to gives _____

8. Benzenediazonium chloride reacts with warm water to form _____

9. What is functional isomerism?

10. State the conformations

SECTION – B

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

11. a) How are following conversion achieved?

i) Ethylene ⟶ succinic acid

ii) Malonic acid ⟶ fumaric acid

iii) Ethanoic acid ⟶ malonic acid.

(OR)

b) i) Discuss the isomerism exhibited by maleic acid and fumaric acid.

ii) Phthalic acid + PCl_5 ⟶ ?

12. a) Describe the preparation and properties of methylcyanide .

(OR)

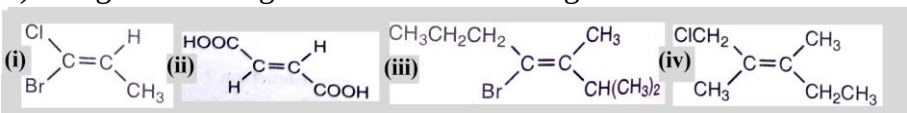
b) How is urea prepared? Describe its resonance structure.

13. a) Give the preparation and properties of diazomethane .

(OR)

b) Describe the reduction of nitrobenzene in neutral, alkaline and acid media.

14. a) Assign E-Z configuration of the following alkenes.



(OR)

b) Write a short note on asymmetric synthesis.

15. a) Explain why cyclobutane is more stable than cyclopropane.

(OR)

b) Draw and explain the conformations of decalin.

SECTION – C

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

16. How will you synthesize the following compounds :

i) Tartaric acid from ethylene

ii) Phthalic anhydride from o-xylene

iii) Adipic acid from cyclohexane

17. i) How will you distinguish between primary, secondary and tertiary amines?

ii) Write any two preparations of thiourea.

18. How are the following compounds obtained?

i) m-Chloronitrobenzene from nitrobenzene

ii) p-Benzoquinone from aniline

iii) p-Aminobenzoic acid form Toluidine

iv) m-Fluorotoluene from Toluidine

19. Give an account of:

i) Newmann projection ii) Walen inversion

20. Write notes on: (i) Bayer's strain theory (ii) Conformation of cyclohexane

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential)

[Affiliated to Madurai Kamaraj University]

B.Sc. Chemistry Degree (Semester) Examinations, November 2017

Part – III : Core Subject : Fifth Semester : Paper – II

INORGANIC CHEMISTRY - II

Under CBCS – Credit 5

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

SECTION – A

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

1. Ligand is a _____?
   a) Bronsted acid b) Bronsted base
   c) Lewis acid d) Lewis base
2. Give the name of the complex $K[BF_4]$.
3. What is the Crystal Field Stabilization Energy for d^{10} electrons?
   a) 0 b) 4 c) 6 d) 12
4. According to Crystal Field Theory the bond between the central metal atom and the ligands are due to _____ interaction.
5. Inner sphere electron transfer is rare in biological systems, where redox sites are often shielded by _____
   a) Amino acid b) Bulky proteins
   c) Carbohydrates d) Fats
6. Mixed valence compounds contain an element which is present in more than one _____
7. What is the formula for mean?
8. _____ error is the difference between observed and actual value.
   a) Operational b) Instrumental c) Absolute d) Personal
9. The colour of blood is due to _____ element.
10. Which of the following element is used for diagnosis of cancer?
    a) Silicon b) Iodine c) Helium d) Neon

SECTION – B

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

11. a) Explain Werner theory of co-ordination compound with an example. **(OR)**
    b) Discuss the bonding in complexes – $[Co(NH_3)_6]^{3+}$ and $[MnCl_4]^{2-}$?
12. a) Elaborate the crystal field splitting in octahedral complex.
    (OR)
    b) Elaborate the crystal field splitting in tetrahedral complex.
13. a) Define labile and inert complex with an example.
    (OR)
    b) Discuss the Trans effect in coordination compounds with an example.
14. a) What are the classifications of errors? Explain.
    (OR)
    b) Explain the following terms i) absolute error, ii) standard deviation and iii) relative error.
15. a) Write the function and toxicity of F, AL, Cl, Ca, Mn, Zn and Co in biological system. **(OR)**
    b) Write the function and toxicity of Mo, Sn, Hg, Pb, Mg, As and Na in biological system.

SECTION – C

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

16. Explain in detail the ionization, coordination, linkage and geometrical isomerism in coordination complexes with example.
17. Give the postulates of molecular orbital theory and explain the sigma bonding in octahedral complexes.
18. Discuss the substitution reactions in cobalt and platinum complexes.
19. Explain i) Co-precipitation ii) Post precipitation and iii) Difference between precision and accuracy.
20. Discuss the role of radioactive elements in the field of agriculture and cancer diagnosis and treatment.

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

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[Affiliated to Madurai Kamaraj University]

B.Sc. Chemistry Degree (Semester) Examinations, November 2017

Part – III : Core Subject : Fifth Semester : Paper – III

PHYSICAL CHEMISTRY - III

Under CBCS – Credit 4

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

SECTION – A

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

1. Which of the following will not give a electrolytic solution?
   a) Acetic acid b) Sodium chloride
   c) Glucose d) Hydrogen chloride
2. According to Arrhenius theory, define an acid.
3. In an electrochemical cell the _____ takes place at anode.
   a) Reduction b) Oxidation
   c) Sublimation d) Evaporation.
4. Which electrode is used to measure the pH of a solution?
5. Differentiate primary and secondary cells
6. _____ acid is used as an electrolyte in the lead storage battery
   a) Sulphuric acid b) Nitric acid
   c) Acetic acid d) Hydrofluoric acid.
7. "Only those light which is absorbed by the system can bring about a photochemical change" is the law of photochemistry given by_____
   a) Grotthus and Draper b) Stark and Einstein
   c) Beer and Lamberts d) none of them
8. Define Beer-Lamberts law.
9. Define a phase.
10. Water exist in -------- phases.
    a) 1 b) 2 c) 3 d) 4

SECTION – B

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

11. a) Write short note on Oswalt's law and its application.

    (OR)

    b) Discuss in detail about Arrhenius theory.
12. a) Explain the metal-metal ion electrode and gas electrode.

    (OR)

    b) i) What is liquid junction potential? (ii) Explain the term salt bridge.
13. a) Write a note on polorography .

    (OR)

    b) Write short note on i) westron-cadmium cell
    ii) Lead storage cell.
14. a) Explain the formation of *HCL* through photochemical reaction.

    (OR)

    b) Differentiate fluorescence from phosphorescence.
15. a) Give the thermodynamic derivation of phase rule.

    (OR)

    b) Describe the one component system of water.

SECTION – C

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

16. Explain: i) Onsager equation
    ii) Kohlraush law and its application.
17. Derive Nernst equation for both oxidation and reduction potentials.
18. Explain elaborately the acid base reaction through potentiometric titration.
19. Draw and explain Jablonski diagram.
20. Give a neat sketch and explain Pb-Ag phase rule system.

07EP51

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

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B.Sc. Chemistry Degree (Semester) Examinations, November 2017

Part – III : Elective Subject : Fifth Semester : Paper – I

COMPUTER APPLICATION IN CHEMISTRY AND GREEN CHEMISTRY

Under CBCS – Credit 5

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

SECTION – A

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

1. Which of the following is an input device?

   a) Mouse b) Keyboard c) Scanner d) All the above

2. Memory is mainly classified into _____ types.

   a) 2 b) 5 c) 4 d) 10

3. The short cut key for create a new text document is

   a) Ctrl + O b) Ctrl + N c) Ctrl S d) Ctrl K

4. Which one is eco-friendly?

   a) Diesel b) Petrol c) Bio-Diesel d) Kerosene

5. Which of the following is a product of green chemistry?

   a) Corn oil b) Petroleum c) Coal tar d) Coke

6. PC stands for _____.

7. RAM stands for _____.

8. The extension for MS word document is _____.

9. An example for green solvent is _____.

10. The number of main principles involved in green chemistry is _____.

SECTION – B

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

11. a) Define computer. How is it classified?

    (OR)

    b) Write a short note on input and output devices.

12. a) Explain the decimal and binary number systems.

    (OR)

    b) Explain in detail hardware and software devices.

13. a) Write a short note on chemdraw and mention its significance.

    (OR)

    b) Explain the applications of MS word in various fields.

14. a) What is the need for green chemistry?

    (OR)

    b) What are importance of green chemistry education?

15. a) Explain the scope of green chemistry.

    (OR)

    b) Write a brief note on atom economy.

SECTION – C

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

16. Draw and explain the various parts of a computer.
17. What is meant by memory unit? Explain the various types of memories in computer.
18. Define DBMS. Write a detailed note on data bases using MS access.
19. a) State and explain the environmental protection laws. (4)

    b) Write a note on products of green chemistry (6)
20. Define green chemistry. Discuss the twelve principles of green chemistry.

07NE11

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

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B.A./B.Sc. Degree (Semester) Examinations, November 2017

Part – IV : NME Subject : First Semester : Paper – I

FOOD CHEMISTRY

Under CBCS – Credit 2

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

SECTION – A

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

1. Prevention of food Adulteration Act was initiated in the year

   a) 1952 b) 1954 c) 1958 d) 1960

2. Which one of the following is not a body-building food?

   a) Meat b) pulses and legumes

   c) fruits d) egg

3. Which of the following is an adulterant?

   a) Urea b) pesticides c) iron filing d) All of these

4. Why do organic foods often cost more than nonorganic foods

   a) Higher taxes b) productions costs

   c) more organic farms d) none of these

5. Deficiency of vitamin A causes

   a) Beri-Beri b) Night blindness c) Scurvy d) Anaemia

6. The Central AGMARK laboratory is located at _____.

7. We obtain our food from _____.

8. Carbohydrates provide _____ to our body.

9. Vitamin C is called _____.

10. India adopted the national Nutritional policy in _____.

SECTION – B

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

11. a) Write a short note on Chemicals in food.

    (OR)

    b) Give the advantages of Pressure Cooking.

12. a) What is the principle of food preservation? How are tomatoes preserved?

    (OR)

    b) Why do we cook food? What are limitations of it?

13. a) Explain different types of food spoilage?

    (OR)

    b) Describe the preparation and uses of BHC and DDT.

14. a) Explain the role of chemical preservatives in food.

    (OR)

    b) What is Spirulina? How is it nutritionally superior to milk and egg?

SECTION – C

Answer any TWO Questions: **($2 \times 12\frac{1}{2} = 25$)**

15. i) How is food irradiated? Explain the advantages.

    ii) What are organic foods?

16. List at least 7 articles normally adulterated, name the adulterant and test for detection of adulterant.

17. Discuss the different methods of food groups.

07SB3A

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

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B.Sc. Chemistry Degree (Semester) Examinations, November 2017

Part – IV : Skill Based Subject : Third Semester : Paper – I

BIOMOLECULES AND PHARMACEUTICAL CHEMISTRY

Under CBCS – Credit 2

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

SECTION – A

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

1. 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

2. Which substance is not present in nucleic acid?

   a) Cytosine b) Adenine c) Thymine d) Guanidine

3. How many carbonyl groups present in Uracil

   a) 0 b) 6 c) 4 d) 2

4. Dr. Marton use N_2O first time in surgical operation in year_____.

   a) 1864 b) 1812 c) 1846 d) 1833

5. Role of messenger ribonucleic acid (mRNA) is_____ production.

   a) Nucleic acid b) enzyme c) protein d) chromosome

6. Draw a structure of Adenine, Guanine?

7. What do you mean by anti-inflammatory agent?

8. Draw a structure of Cocaine?

9. Write any one difference in DNA and RNA.

10. What is meant by protein?

SECTION – B

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

11. a) Discuss following terms: (i) Nucleosides (ii) Nucleotides (iii) Nucleic acid **(OR)**

    b) Write a note on preparation and properties of amino acids.

12. a) Discuss (i) Zwitter ion (ii) Fischer Lock and Key model. (3+7)

    (OR)

    b) Write a note on factors affecting in enzymes catalytic activity.

13. a) Write a note on mode of action, advantage and disadvantage of gaseous anaesthetics. **(OR)**

    b) Discuss structure, advantage and disadvantage of Thiopental sodium.

14. a) What do you mean by anaesthetics? Write the characteristics of ideal anaesthetics. **(OR)**

    b) Write a note on antipyretic analgesics.

SECTION – C

Answer any TWO Questions: **($2 \times 12\frac{1}{2} = 25$)**

15. Differentiate Narcotic and Non-narcotic analgesic?

16. Discuss structural and medicinal properties of paracetamol and ibuprofen.

17. Briefly explain formaldehyde and phenol derivatives as antiseptic and disinfectant.