07AT01



Answer ALL Questions :

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential) [Affiliated to Madurai Kamaraj University] B.Sc. (Bot. / Zoo.) Degree (Semester) Examinations, November 2015

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

$(10 \times 1 = 10)$

1. 80 gram of Na normality of th	OH pellets dissolv ne solution is	ed in one litre o	of H_2O , the
a) 8 N	b) 2 N	c) 10 N	d) 40 N
2. The equivalent	t weight of sulphu	ric acid is	
a) 63	b) 60	c) 49	d) 68
3. The isomers of	f a substance must	have	
a) Same chem	nical properties	b) Same mole	cular formulae
c) Same struc	tural formulae	d) Same func	tional groups
4. The functional	group of alcohol i	is	
a) –OH	b) –CHO	c) –COOH	d) $-NH_2$
5. Which of the f	ollowing is an elec	ctrophile?	
a) $CH_3\overline{O}$	b) $CH_3 \overset{+}{C}H_2$	c) <i>NH</i> ₃	d) $CH_3\overline{C}H_2$
6. Define carbani	on.		
7. Define promot	er and give an exa	mple.	
8. Chemilumines	cence is the	as a result of	chemical reaction.
a) Absorption	of light	b) Emission	of light
c) Refraction	of light	d) None of t	he above
9. Give few exam	ples for free radic	als.	

10. What are nucleophiles? Give examples.

SECTION – B

Answer ALL Questions :

 $(5 \times 7 = 35)$

11.a) Define standard solution. Explain primary standard solution and their requirements.

(**OR**)

- b) i) What is the molarity of a solution prepared by dissolving5.0 gram of toluene in 225 gm of benzene?
 - ii) What is meant by end point and indicator?
- 12.a) What is meant by isomerism? How is it classified? Explain chain and position isomerism with suitable example.

(OR)

- b) Write a short note on emprirical formula and molecular formula.
- 13.a) Explain addition and elimination reactions with suitable examples.

(**OR**)

- b) Explain substitution, rearrangement and polymerization reactions with suitable examples.
- 14. a) Describe hemolytic fission and hetrolytic fission of a covalent bond with an example.

(**OR**)

b) Explain relative stability of primary, secondary and tertiary Carbonium ions. 15. a) Compare thermal and photochemical reactions.

(OR)

b) Distinguish between homogeneous catalysis and heterogeneous catalysis with suitable examples.

<u>SECTION – C</u>

Answer any THREE Questions : $(3 \times 10 = 30)$ 16. a) Explain the following terms : i) Equivalent weight (6) ii) Normality iii) Molarity iv) Molecular weight b) Write a note on basic principles of volumetric analysis. (4) 17. a) Explain metamerism and functional group isomerism with suitable example. (5) b) Write a note on stereoisomerism. (5) 18. a) Explain tautomerism with an example. (4) b) Explain the following terms with suitable examples (6) i) Electrophile ii) Nucleophile 19. a) What are organic reaction intermediates? Give a few examples. b) Explain the following terms with suitable examples. (4+6)ii) Free radical i) Carbanion 20. a) What are the various applications of radioactive isotopes in

b) Write brief notes on catalytic poison and positive catalysis.

(6 + 4)

biology and medical fields?

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07AT01



VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST (Autonomous & Residential)

[Affiliated to Madurai Kamaraj University] **B.Sc. Physics** Degree (Semester) Examinations, November 2015 Part – III : Allied Subject : First Semester : Paper – I

INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY

Time: 3 Hours

Under CBCS – Credit 4

Max. Marks: **75**

<u>SECTION – A</u>

Answer ALL Questions :

 $(10 \times 1 = 10)$

- 1. 80 gm of NaOH pellets dissolved in 1 litre of H₂O. The normality of the solution is ______.
 - a) 8 b) 2 c) 10 d) 40
- 2. The equilibrium distance at which the two atomic nuclei are held is called
 - a) Bond energy b) Bond length
 - c) Stabilization energy d) Ionic radius
- 3. The bond order of O_2 molecule is?
 - a) Zero b) One c) Two d) Three
- 4. An Atom bomb is based on _____ Principle.
 - a) Nuclear fission b) Nuclear fusion
 - c) Both d) None of the above
- 5. It is an acetyl derivative of salicyclic acid

a) Aspirin	b) Phenolphthalein

- c) Hexachlorobezene d) Malachite green
- 6. What is the principle of volumetric analysis?
- 7. Define hybridization.
- 8. Draw the shape of BF_3 molecule on the basis of VSEPR theory.
- 9. What are the compositions of nucleus?
- 10. Mention any one use of phenolphthalein.

$\underline{SECTION - B}$

Answer ALL Questions : $(5 \times 7 = 35)$ 11.a) Define standard solution? Explain primary standard solution and their requirements? (\mathbf{OR}) b) What do you know about the concept of molecular weight, formula weight and equivalent weight? 12. a) Explain the formation of H₂ molecule on the basis of VB theory. (\mathbf{OR}) b) Discuss the sp^3 hybridization with suitable examples. 13.a) Draw and explain the M.O. diagram of H₂ and He₂ molecules. (\mathbf{OR}) b) Bring out the differences between bonding and anti-bonding molecular orbital. 14.a) State and explain Soddy's group displacement law. (**OR**) i) Mass defect ii) Binding energy b) What is mean by 15.a) What are crown ethers. Discuss the applications of crown ethers and malachite green. (\mathbf{OR}) b) How TNT and BHC are prepared? Explain their properties. **SECTION – C Answer any THREE Questions :** $(3 \times 10 = 30)$ 16. a) Explain the following terms : (7 + 3)i) Normality ii) Molarity iii) Weight Percentage b) What is the basic requirement of volumetric titration? 17. Explain the various postulates of VBT with suitable examples. 18. a) What are the postulates of VSEPR theory. (5 + 5)b) Explain the shape of the following molecules on the basis of VSEPR theory. i) X_eF_4 ii) PCl₅ 19. a) Distinguish between nuclear fission and nuclear fusion. (4 + 6)b) What are the applications of radioactive isotopes in various fields? 20. List out the synthesis and applications of lithium aluminium hydride and aspirin.





(Autonomous & Residential)

 [Affiliated to Madurai Kamaraj University]
 B.Sc. Chemistry Degree (Semester) Examinations, November 2015 Part – III : Core Subject : First Semester : Paper – I

INORGANIC AND PHYSICAL CHEMISTRY

Under CBCS – Credit 4 Time: **3** Hours

Max. Marks: 75

<u>SECTION – A</u>

Answer ALL Que	estions :		$(10 \times 1 = 10)$
1. The energy of an electron in Bohr's atom		as we	
move away fro	om the nucleus.		
a) Remains the	e same	b) Decreases	c) Increases
d) Sometimes	increases, Some	etimes decrease	S
2. The orbital wit	h n = 3 and $1 =$	2 is	
a) 3s	b) 3p	c) 3d	d) 3f
3. The attraction	exerted by an at	om on the elect	ron pair bonding it
to another atom	n by covalent be	ond is called	
a) Ionisation e	energy	b) Electron af	finity
c) Electronega	ativity	d) Non of the	se
4. The human kidneys purify the blood by throug		through	
natural membr	anes.		
a) Osmosis	b) Diffusion	c) Dialysis	d) Emulsification
5. When a substat	nce is uniformly	v distributed three	oughout the bulk,
the phenomeno	on is called		
a) Positive add	sorption	b) Negative a	dsorption
c) Absorption		d) Desorption	1
6. Define Compto	on Effect.		
7. State Hund's r	ule.		
8. Define Ionic be	ond.		
9. What is Brown	ian movement?		

10. What are catalytic poisons?

<u>SECTION – B</u>

<u>Answer ALL Questions</u> :

 $(5 \times 7 = 35)$

11.a) i) State and explain Ritz combination principle.

ii) Discuss the Hydrogen spectrum.

(OR)

- b) i) Write a note on Photoelectric effect.
 - ii) State and explain Heisenberg uncertainty principle.
- 12. a) Write short notes on i) Eigen function and Eigen values.
 - ii) Quantum numbers.

(OR)

- b) State and explain Aufbau principle and Pauli's exclusion principle.
- 13.a) i) Explain why inert gases have very high ionization potential than their neighbours?
 - ii) Why is the ionization potential of nitrogen greater than that of oxygen?

(**OR**)

b) Define Lattice energy. How lattice energy is calculated using Born-Haber cycle?

14.a) i) Discuss the types of colloids.

ii) Write the difference between gels and emulsions.

(OR)

b) Write short notes on i) Stability of colloids.

ii) Donnan- Membrance equilibrium.

15.a) i) What are the factors affecting the adsorption?

ii) Give any two applications of adsorption.

(**OR**)

b) Describe the theories of catalysis.

<u>SECTION – C</u>

Answer any THREE Questions :

 $(3 \times 10 = 30)$

- 16. a) Derive De-Broglie's equation.
 - b) Write a note on Bohr-Sommerfeld theory.
- 17. a) Derive Schrodinger wave equation.b) What is Zeeman effect?
- 18. Explain the following i) Hydrogen bondii) Metallic bond iii) Fajan's rule
- a) Describe determination of molecular weight by light scattering method.
 - b) Explain any three applications of colloids.
- 20. a) Derive Langmuir adsorption isotherms.

b) Explain the characteristics of catalysis.

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(Autonomous & Residential)
 [Affiliated to Madurai Kamaraj University]
 B.Sc. Chemistry Degree (Semester) Examinations, November 2015
 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 :

 $(10 \times 1 = 10)$

1. Write IUPAC name of the following compound:

$$CH_3 - CH - CH_2 - CH_3$$

 $| CH_3$

- 2. Give an example for positional isomerism.
- 3. Write the order of stability of 1° , 2° , 3° carbocations.
- 4. What is homolytic fission.
- 5. Give a method to prepare methane.
- 6. Predict the unstable intermediate in the following reaction:

CH₄
$$\xrightarrow{\text{Oxidation}} \left(\bigcup_{\text{unstable}} \xrightarrow{-H_2O} \xrightarrow{H}_{H} C = O \right)$$

- 7. What is the C C bond length in benzene.
- 8. Which of the following is not aromatic?



- 9. What is the electrophile which involved in the sulphonation of benzene?
- 10. Name any two activating substituents in aromatic system.

$\frac{\text{SECTION} - B}{\text{Answer ALL Questions}} : (5 \times 7 = 35)$ 11. a) What is isomerism? Explain chain isomerism and functional

(2 + 5) what is isomerism? Explain chain isomerism and functional isomerism with examples.

(**OR**)

b) Write the IUPAC name for the following compounds:





12.a) Discuss "Inductive effect" in detail.

(**OR**)

- b) What are electrophilic and nucleophilic reagents and discuss their classification with examples.
- 13.a) Discuss the mechanism of free radical substitution in methane by halogenation.

(OR)

- b) i) Discuss any two methods for the preparation of alkynes.
- ii) Write a note on geometrical isomerism. (4+3)

14. a) Discuss the preparation and structure of benzene.

(OR)

- b) Write a note on resonance and resonance energy in benzene.
- 15.a) i) What do you mean by o, p directors in aromatic substitution reactions? Explain with examples.
 - ii) What are activating substituents in aromatic system?Give examples. (5 + 2)

(OR)

b) Discuss the nitration of benzene with mechanism.

Answer any THREE Questions :

<u>SECTION – C</u>

$(3 \times 10 = 30)$

- 16. a) Explain any four rules for naming the organic compounds.
 - b) Write a note on positional isomerism and metamerism. (4+6)
- 17. Explain the following reactions with one example each
 a) Addition reactions
 b) Substitution reactions
 c) Rearrangement reactions
 (3 + 3 + 4)
- 18. Explain Markovnikov's rule and explain peroxide effect on addition reactions of alkenes.
- 19. What is aromaticity. Explain modern theory of aromaticity.
- 20. Write a note on the following with mechanism:a) Friedel-Crafts acylationb) Sulphonation (5 + 5)

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST (Autonomous & Residential)

[Affiliated to Madurai Kamaraj University] B.Sc. Chemistry Degree (Semester) Examinations, November 2015 Part - III : Core Subject : Third Semester : Paper - I

INORGANIC AND ORGANIC CHEMISTRY

Time: **3** Hours

Under CBCS - Credit 5

Max. Marks: 75

SECTION – A

Answer ALL Questions :

 $(10 \times 1 = 10)$

- 1. Which of the following is a primary standard solution? b) Oxalic acid a) NaOH d) None of these c) $KMnO_4$
- 2. What is the indicator used for the titration of Na₂CO₃ Vs HCl?

3. Define an ore?

- 4. What are the two types of fluxes?
- 5. Give the structure of 2, 4, 6 trinitrophenol.
- 6. Complete the following reaction

− OH + HC1 → ?

- 7. Write the formula for methyl propyl ether.
- 8. Give the structure for cyclohexane thiol.
- 9. Draw the structure of quinine.
- 10. What will you get when benzophenone reacts with potassium hydroxide?

SECTION – B

Answer ALL Questions :

 $(5 \times 7 = 35)$

- 11.a) Define:- i) molarity ii) normality and iii) weight percentage (**OR**)
 - b) Discuss any two types of titrometric analysis.

12. a) Write short notes on froth flotation technique.

(\mathbf{OR})

b) Write short notes on zone refining method.

13.a) How will you prepare the following from phenol

i) aniline ii) benzene and iii) anisole

(\mathbf{OR})

b) Write the preparation of anthracene by Haworth process.

14.a) Explain the commercial preparation of diethyl ether from ethylene. Give the uses of diethyl ether.

(\mathbf{OR})

b) Prepare ethanethiol from i) Ethyl alcohol and ii) Thiourea 15.a) Write the reaction of Grignard reagent with

> ii) ketone with mechanism i) aldehyde and

(**OR**)

i) paraldehyde and ii) metaldehyde b) Write a note on

SECTION – C

Answer any THREE Questions :

 $(3 \times 10 = 30)$

- 16. Explain the preparation of standard solution, standardization of secondary standared solution with an example.
- 17. a) Compare the properties of elements in III and IV group. b) Write short note on von-Argel method.
- 18. How will you prepare naphthalene by Haworth synthesis from benzene.
- 19. Write the structure, preparation and properties of mustard gas.
- 20. Give the preparation of benzaldehyde by
 - i) Gattermann-Kotch reaction ii) Gattermann aldehyde reaction iii) Rosenmund reaction and iv) using grignard reagent

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential) [Affiliated to Madurai Kamaraj University] B.Sc. Chemistry Degree (Semester) Examinations, November 2015 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 :

 $(10 \times 1 = 10)$

- 1. According to GayLussac's law for a fixed volume of a given gas a) b) c) d)
- 2. A system that can transfer both energy and matter to and from its surroundings is called
 - a) an isolated system b) a closed system
 - c) an open system d) a heterogeneous system
- 3. When water is cooled to ice, its entropy b) decreases c) remains the same d) a) increases becomes zero
- 4. The Third law of thermodynamics states that in the a) b) c) d)
- 5. Which of the following can change the value of the equilibrium constant for a reaction
 - a) changing the concentration of the reactants
 - b) adding a catalyst c) changing the solvent
 - d) removing the products as they are formed
- 6. What is London forces?
- 7. Why is joule Thomson coefficient of an ideal gas zero?
- 8. Calculate the efficiency of a heat engine operating between 400K and 300K.
- 9. Write Debye T3 law.
- 10. Who won the Nobel prize for the synthesis of ammonia?

SECTION - B

Answer ALL Questions : $(5 \times 7 = 35)$ 11.a) Deduce Boyle's law from kinetic gas equation.

(OR)

b) How will you calculate collision diameter and mean free path from viscosity measurement?

12.a) Explain the terms heat capacity and heat capacity at constant volume.

(OR)

- b) Derive thermodynamically for one mole of an ideal gas.
- 13.a) Establish the criteria for feasibility of a process.

(OR)

- b) How does free energy vary with temperature and pressure?
- 14. a) Explain the Nernst heat theorem.

(OR)

b) Explain how the entropy changes calculated in a chemical reaction?

- 15.a) What is Le Chatelier's principle? Explain giving examples. (OR)
 - b) Explain the terms i) Homogeneous equilibrium ii) Hetreogeneous equilibrium

SECTION – C

Answer any THREE Questions :

 $(3 \times 10 = 30)$

- 16. Give a brief account Maxwell's distribution law of velocities. Explain with the help of graph, how molecular velocities change with increase in temperature.
- 17. i) Derive a relationship between pressure and volume in adiabatic expansion of an ideal gas.

ii) The van der Waals constants a and b for hydrogen in units, are 0.246 and respectively. Calculate the inversion temperature of hydrogen.

- 18. Derive clausius Clapeyron equation.
- 19. State and explain the Third law of thermodynamics. How can it be verified experimentally?
- 20. i) Give an experimental proof of dynamic nature of chemical equailibrium.

ii) Calculate the pressure of gas at 700K in the heterogeneous equilibrium reaction for this reactions is .

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(Autonomous & Residential) [Affiliated to Madurai Kamaraj University] **B.Sc. Chemistry** Degree (Semester) Examinations, November 2015

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 :

 $(10 \times 1 = 10)$

- Tartaric acid when treated with Fenton's reagent gives ______.
 a) dihydroxy fumaric acid b) tartonic acid
 c) mesoxalic acid d) oxalic acid
- 2. Which one of the following is most basic?a) Methylamine b) Ethylamine c) Diethylamine d) Ammonia
- 4. Naphthalene when reduced with sodium and isoamyl alcohol gives ______.
 a) tetralene b) decalene c) 1, 2 dialin d) 1, 4 dialin
- 5. A meso form of tartaric acid is optically inactive due to ______.
 a) dextrorotatory nature b) levorotatory nature
 c) internal compensation of two opposite rotations
 d) external compensation of two opposite rotations
- 6. How is adipic acid obtained?
- 7. How will you distinguish ethylcyanide and ethylisocyanide?
- 8. How will you prepare p-toluidine?
- 9. What are condensed polynuclear hydrocarbons?
- 10. Designate the compound whether it has E or Z configuration.



<u>SECTION – B</u>

Answer ALL Questions :

 $(5 \times 7 = 35)$

11.a) Narrate the optical isomerism exhibited by tartaric acid.

(OR)

- b) Describe the geometrical isomerism exhibited by maleic and fumaric acids.
- 12. a) Give an account of the structure of urea.

(**OR**)

b) Explain what happens when ethylamine reacts with

i) nitrous acid ii) acetyl chloride

- iii) potassium hydroxide and chloroform $(2 + 2\frac{1}{2} + 2\frac{1}{2})$
- 13. a) What happens when diazomethane is treated with the following

reagents?	i) Sodium amalgam	ii) Acetylene
iii) Ethylene	iv) Acetaldehyde	$(1\frac{1}{2} + 1\frac{1}{2} + 2 + 2)$
	(OR)	

b) What are the synthetic uses of diazoacetic ester?

14. a) Write a note on conformational analysis of cyclohexane.

(**OR**)

b) Write briefly about Bayer's strain theory.

15. a) What is meant by asymmetric synthesis?

Write a method of asymmetric synthesis.

(**OR**)

b) Explain the phenomenon of optical isomerism in allenes.

<u>SECTION – C</u>

Answer any THREE Questions :

 $(3 \times 10 = 30)$

- 16. Give two methods for preparing phthalic acid and how will you
 - convert it intoa) benzeneb) phthalimidec) phenolphthaleind) anthranitic acid
- 17. a) How will urea prepared in the laboratory? Give the reaction of urea with i) HNO₂ ii) CH₃COCl iii) NH₂ NH₂
 - b) Suggest two tests to differentiate primary and secondary amines.

(8+2)

- a) Explain the reduction of nitrobenzene under different conditions and indicate the products formed in each.
 - b) Account for this : Aniline is a weaker base than ethylamine.

(7 + 3)

- 19. a) How is anthracene prepared? Describe its properties.
 b) Draw the Newmann projection formulae for the different conformations of n butane and point out the most stable conformation among them. (6 + 4)
- 20. a) Write a note on determination of configuration of cis-trans isomers.b) Explain resolution of racemic mixture with an example. (5 + 5)

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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential) [Affiliated to Madurai Kamaraj University] B.Sc. Chemistry Degree (Semester) Examinations, November 2015 Part - III : Core Subject : Fifth Semester : Paper - II

INORGANIC CHEMISTRY – II

Under CBCS - Credit 5

Max. Marks: 75

SECTION – A

Answer ALL Questions :

Time: 3 Hours

 $(10 \times 1 = 10)$

- 1. Coordination number of $[Co(NH_3)_6]^{3+}$ is b) 4 c) 5 d) 6 a) 2
- 2. The hybridisation of Ni in [Ni(CO)₄] is b) sp^3 c) dsp^3 d) sp^3 d a) sp
- 3. In neutral medium, the equivalent mass of KMnO₄ is a) M/2 b) M/3 c) M/5 d) M/6
- 4. Which one of the following not toxic element?
 - b) Xe c) Pu d) Ra a) As
- 5. Which one of the following kinetically stable compounds? a) Non-inert complexes b) alloy complexes c) inert complexes d) none
- 6. What are types of coordination isomerism?
- 7. Mention the t_{2g} orbital.
- 8. What is the difference between absolute and relative error?
- 9. Write any two essential elements.
- 10. State the Trans effect.

SECTION – B

Answer ALL Questions :

 $(5 \times 7 = 35)$

11.a) Explain VB theory with examples.

(OR)

b) State the EAN rule. Calculate the following complexes obey the EAN rule i) $[Cu (NH_3)_4]^{2+}$ ii) $[CoF_6]^{3-1}$

12. a) List out the important features of CFT.

(OR)

- b) Write the limitations and applications of CFT.
- 13.a) Write the sources and minimization of errors. (OR)
 - b) Explain the method of least squares.
- 14.a) Give a brief account of Haemoglobin and Myoglobin as oxygen carriers.

(OR)

- b) Write the function and toxicity of any two elements in biological elements.
- 15.a) Illustrate the mechanism of the dissociative with examples. (OR)
 - b) Write about the substitution reaction of platinum complexes.

SECTION – C

Answer any THREE Questions :

 $(3 \times 10 = 30)$

- 16. Write note on the following a) Ionisation isomerism b) linkage isomerism c) geometrical isomerism
 - d) optical isomerism. (2+2+3+3)
- 17. Discuss the tetrahedral complexes with examples using MO theory.
- 18. Write note on a) co-precipitation b) post precipitation
- 19. Discuss in detailed the biochemistry of iron.
- 20. Describe the mechanism of inner and outer sphere electron transfer reactions.





VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential) [Affiliated to Madurai Kamaraj University] B.Sc. Chemistry Degree (Semester) Examinations, November 2015 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 :

 $(10 \times 1 = 10)$

1. On passing one faraday of electricity, one mole of metal is deposited from the solution of

a) NaCl c) AlCl₃ b) CaCl₂ d) none of these

2. Standard cell potential is

a) measured at a temperature of 250 C

b) measured when ionic concentrations of aqueous reactants are 1.00M c) measured under the conditions of 1.00 atm for gaseous reactants d) all of the above

- 3. In the polarographic technique ______ is called polarogram. a) current – voltage curve b) current density c) the electrolyte d) diffusion layer
- 4. The light emitted in a chemiluminescent is also called a) cold light b) hot light c) bright light d) none of these
- 5. Water system has three phases-ice, water and vapours. The number of components in the system is
 - d) four a) one b) two c) three
- 6. Name a theory which explains the behavior of weak electrolytes.
- 7. What is the sign of oxidation potential?
- 8. Define the term decomposition potential.
- 9. What is quantum efficiency?
- 10. Who discovered the phase rule first?

SECTION – B

Answer ALL Questions : $(5 \times 7 = 35)$ 11.a) i) Discuss the limitations of Arrhenius theory. ii) The specific conductance of 0.01M solution of formic acid was found to be 0.01 at 25oC. Calculate the degree of dissociation of the acid. Molar conductance of formic acid at infinite dilution is. (OR) b) Give an account of the Debye – Huckel theory of strong electrolytes. 12. a) What are the different types of reversible electrode? (OR)b) What is electrochemical series? What are its applications? 13.a) Discuss the potentiometric titrations with suitable examples. (OR)i) Lead storage cells b) Explain the following : ii) Westron cadmium cells. 14.a) Discuss the kinetics of the photochemical reaction (OR)b) i) What are the reasons for abnormal quantum yied? ii) Distinguish between fluorescence and phosphorescence with the help of Jablonski diagram. 15.a) Discuss the salient features of lead – silver system. (OR) b) Give the labelled phase diagram of water system and discuss the importance of various points, lines and areas. **SECTION – C** $(3 \times 10 = 30)$ **Answer any THREE Questions :**

16. i) State and explain Kohlrausch law. ii) Explain any two applications of conductance measurements. iii) Define the term ionic mobility.

How is it determined experimentally?

- 17. i) Derive the Nernst equation for the effect of concentration of electrolyte on electrode potential.
 - ii) What is liquid junction potential? How can it be minimized?
 - iii) Derive the relation between electromotive force and equilibrium constant of a cell reaction
- 18. i) What is corrosion. How will you prevent it?ii) Explain any two applications of over voltage.iii) Give the advantages of polarographic analysis.
- 19. Briefly discuss the following i) flash photolysis ii) photosensitization
- 20. Discuss the features of phase diagram of two components system miscible in liquid state.



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VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential) [Affiliated to Madurai Kamaraj University] B.Sc. Chemistry Degree (Semester) Examinations, November 2015 Part – III : Elective Subject : Fifth Semester : Paper – I

GREEN CHEMISTRY

Time: 3 Hours

Under CBCS - Credit 5 Max. Marks: 75

SECTION – A

Answer ALL Questions :

 $(10 \times 1 = 10)$

- 1. Define Green chemistry.
- 2. Expand the term, "EPA".
- 3. Which one of the following is not correct according to view point of green chemistry? Green chemistry should be: a) Simple b) Atom efficient c) Toxic d) Environment friendly
- 4. The word, "Green chemistry" was coined by a) Alan R.Katrizky b) Paul T.Anastas d) T.C.Williamson c) Paul Anderson
- 5. Suggest a chemical / compound that can be used as a replacement / alternate to organic solvents.
- 6. What are the alternate names that can be used for green chemistry?
- 7. The twelve principles of green chemistry were proposed by _____ and _____.
- 8. Mention any two phases / steps that involved in a natural product drug discovery.
- 9. Give any two examples of frequently used microbial biocatalysts.
- 10. Mention any two organisms used to produce amino acids by fermentation process.

SECTION – B

- **Answer ALL Questions :**
- $(5 \times 7 = 35)$

11.a) Write a note on the following:

(4 + 3)

- i) Green chemistry and eco-efficiency
- ii) Sustainability and cleaner production

(\mathbf{OR})

- b) Write in detail about "Green chemistry education".
- 12. a) Discuss the pollution control to pollution prevention.

(\mathbf{OR})

- b) Write your idea about pollution a price tag of modern society.
- 13.a) Explain atom economy by taking an example.

(**OR**)

- b) Discuss the scope of green chemistry.
- 14. a) Write a note on natural products drug discovery as a modern outlook. (\mathbf{OR})
 - b) Write a note on microorganisms as a novel source of bioactive compounds.
- 15.a) How will you correlate the fields, green chemistry and biotechnology. (\mathbf{OR})
 - b) Explain the terms fermentation and biotransformation with examples.

SECTION – C

Answer any THREE Questions :

- $(3 \times 10 = 30)$
- 16. i) State any five environmental protection laws. (5 + 5)ii) What are the challenges ahead for a chemist.
- 17. Justify the statement, "Green chemistry The need of the day".
- 18. Highlight the twelve principles of green chemistry.
- 19. Plants as sources of new drugs / biomolecules Justify.
- 20. Bring out the biotransformation reactions in the production of fine chemicals.

NNNNN

07NE11



VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST (Autonomous & Residential) [Affiliated to Madurai Kamaraj University]

B.A. / B.Sc. Degree (Semester) Examinations, November 2015 Part – IV : NME Subject : First Semester : Paper – I

FOOD CHEMISTRY Under CBCS – Credit 2

Time: 2 Hours

Max. Marks: 75

<u>SECTION – A</u>

Answer ALL Questions :

 $(10 \times 1 = 10)$

- 1. The adulterant present in the Tea leaves
 - a) Exhausted tea b) Dried seeds powder
 - c) chalk powder d) none of these
- 2. The boiling point of water in the pressure cooker is
 - a) $0^{\circ}C$ b) $100^{\circ}C$ c) increases d) decreases
- 3. One gram of carbohydrate gives _____ calories.
 - a) 1 b) 6 c) 4 d) 9
- 4. Which one is the natural antioxidant

a) Edible oil b) Ghee c) Black pepper d) Turmeric powder

- 5. The adulterant present in the sugar is
 - a) Rava b) Chalk powder c) Maida d) none of these
- 6. What do you mean by Food Chemistry?
- 7. Define food preservation?
- 8. Give any two methods to preserve the foods.
- 9. Give any two symptoms of the deficiency of Iron in the body.
- 10. Write the abbreviation of 'AGMARK'.

<u>SECTION – B</u>

Answer ALL Questions :

 $(4 \times 10 = 40)$

11.a) Give the Basic Five (ICMR) classification of food groups.

(**OR**)

- b) Discussion on the preliminary preparation.
- 12. a) Explain the adulterants and harmful effects for the following foods.i) Ghee ii) Milk iii) Edible oil iv) Tea leaves (OR)
 - b) Power of food inspectors.
- 13.a) Write short notes on a) Sweeteners b) Colouring agents (**OR**)
 - b) Write short note on nutrient deficiency symptoms and sources of nutrients?
- 14.a) Discuss the advantage and disadvantage of fermentation?

(OR)

b) Grouping of foods discussion on nutritive values.

<u>SECTION – C</u>

Answer any TWO Questions :

 $(2 \times 12^{1/2} = 25)$

- 15. Name three preliminary methods of cooking. Discuss advantage and limitations giving suitable example?
- 16. List at least eight articles normally adulterates, name the adulterant and the test for detection of adulterant.
- 17. What are the points to be considered before designing a packaging systems.

07SB3A



VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST (Autonomous & Residential)

[Affiliated to Madurai Kamaraj University] **B.Sc. Chemistry** Degree (Semester) Examinations, November 2015 Part – IV : Skill Based Subject : Third Semester : Paper – I

BIOMOLECULES AND PHARMACETICAL CHEMISTRY

Time: 2 Hours

Under CBCS – Credit 2

Max. Marks: 75

<u>SECTION – A</u>

Answer ALL Questions :

 $(10 \times 1 = 10)$

- 1. Proteins are,
 - a) Polypeptides b) Polymers of ethylene
 - c) α-aminocarboxylicacids d) Polymers of propylene
- 2. Glycine reacts with nitrous acid to form
 - a) Glycolic acid b) Diketopiperazine
 - c) Methylamine d) Ethyl alcohol
- 3. Which one of the following is an anaesthetics?
 - a) Nitric oxideb) Nitrous oxidec) Nitrogen dioxided) Ammonia
- 4. Heroin is a derivative of
 - a) Caffeine b) Pethidine c) Morphine d) Diacetyl morphine
- 5. Thymol is
 - a) 2-isopropyl -5-methyl phenol b) 3-methyl-6-isopropylphenol
 - d) None of these
- 6. What are α -amino acids?
- 7. Define enzyme specificity?
- 8. Define the term anaesthetics?

c) 3, 4 – dimethyl phenol

- 9. Write the preparation of paracetamol?
- 10. Give the uses of nitrofuroxime?

<u>SECTION – B</u>

Answer ALL Questie	<u>ons</u> :	$(4 \times 10 = 40)$
11.a) What are protei	ns? Discuss the structure	e of proteins?
	(OR)	
b) Define nucleic	acids? Describe the mair	n points of difference
between DNA a	and RNA.	
12. a) Discuss the non	nenclature and classification	tion of enzymes.
	(OR)	
b) Explain the Fis	cher lock and key model	theory.
13.a) Write the advan	tages and disadvantages	of
i) Vinylether	ii) Cyclopropane	iii) Chloroform
	(OR)	
b) Discuss the der	ivatives of salicylic acid	used as analgesics.
14.a) Distinction betw	veen the disinfectants an	d antiseptics.
	(OR)	
b) Give an accoun	t of the derivatives of ph	enol used disinfectants.
	<u>SECTION – C</u>	
Answer any TWO Q	uestions :	$(2 \times 12^{1/2} = 25)$
15. Write the structure	e of morphine. Discuss th	ne analgesic activity of
morphine and its c	lerivatives.	
i) What is a loop	al anaesthetic?	
(0. 1) what is a local set of the set o		
What are requ	irements of a good local	anaesthetic?
What are required with the second sec	irements of a good local hree local anaesthetic?	anaesthetic?