VCD 9/10/19 CHEMISTRY P-II S.Y.B.Sc SEM-IV ATKT Oct 2019
MARKS:100 TIME : 3 Hrs

NOTE: i) All the questions are compulsory.
ii) Figures to right indicate full marks.
iii) Use of non –programmable calculator / log table is allowed.

Q1. A. Fill in the blanks with suitable option (any 12) (12)

i. Poison _____ catalytic activity.
a. increases b. decreases c. doesn't alter.

ii. A catalyst _____ the energy of activation.
a. enhances b. lowers c. maintains

iii. For simple cubic system, number of atoms belonging to unit cell are _____
a. 1 b. 2 c. 3

iv. There are _____ crystal systems and _____ Bravais lattices
a. 14 ,7 b. 7,7 c. 7,14

v. The total number of effective atoms in _____ is 2
a. Simple cubic b. FCC c. BCC

vi. Catalyst and reactants are in different phase in _____ catalysis
a. homogeneous b. heterogeneous c. none of these

vii. Acid rain contains _____.
a. H_2SO_4 and HNO_3 b. H_2SO_4 and HCl c. HNO_3 and HCl

viii. _____ is called king of chemicals.
a. HNO_3 b. H_2SO_4 c. HCl.

ix. N_2O is called as _____.
a. laughing gas b. tear gas c. drowning gas

x. As hydration energy of anions _____ basicity of its aqueous solution increases
a. increases b. decreases c. remains same

xi. As per Bronsted – Lowry concept, base is a proton _____
a. donor b. acceptor c. none

xii. Hydrolysis of hydrated cation makes solution _____
a. basic b. neutral c. acidic

xiii. The pKa values are greater than 14 for _____ cation.
a. Non acidic b. weakly acidic c. feebly acidic

xiv. Thiophene contains _____.
a. N b. O c. S

xv. Pyridine is _____.
a. Aromatic b. non aromatic c. aliphatic

xvi. Diazotization occurs for ____
a. Phenol b. aniline c. benzene

xvii. In Amines , Nitrogen is electron pain _____
a. donor b. acceptor c. both a and b

xviii. _____amine undergoes carbylamine.
a. ethyl b. diethyl c. triethyl

Q1. B. State true or false (any three) (03)

i. Temperature increases the rate of reaction
ii. A cube has 23 elements of symmetry.
iii. Acetylation is carried out by Friedel Crafts reaction
iv. Pyridine is basic
v. Degree of hydrolysis increases with increase in charge to radius ratio.
vi. Phosphoric acid is mineral acid

Q1. C. Match the columns (any five) (05)

Column A	Column B
i. Promoters	a. N_2O
ii. Inhibitors	b. NO
iii. Thiophene	c. N_2O_4
iv. Pyridine	d. 5 membered ring
v. Nitrous oxide	e. 6 membered ring
vi. Nitric oxide	f. Negative catalysts
	g. Positive catalyst
	h. Neutral catalyst

Q.2. Attempt the following (any four) (20)

A. Write a note on catalytic selectivity.
B. Define crystallography. Write a note on law of constancy of interfacial angle.
C. Explain what are promoters and inhibitors with suitable examples.
D. Explain: i. axis of symmetry and ii. Plane of symmetry
E. Write a note on Adsorption theory of catalysis.
F. The first order reflection maxima from (100), (110) and (111) planes of cubic crystal occur at 7.2^0, 10.2^0, 12.5^0 respectively. What type of cubic lattice does the crystal possess?

Q.3. Attempt the following (any four) (20)

A. What are the uses of sulphuric acid?
B. What are the factors affecting hydration of oxo anions?

C. With the help of predominance diagram explain the weakly basic anion and moderately basic anion with suitable examples.
D. List the classification of anions based on pKa values with suitable example.
E. Write the physical properties of nitric acid
F. What is acid rain? What are its effects on environment?

Q.4. Attempt the following (any four) (20)

A. Describe the Paal Knorr synthesis for preparation of i. thiophene and ii. furan.
B. Discuss the aromaticity of furan.
C. Write a note on i. Friedal crafts reaction and ii. Vislmeyer Haack reaction
D. Write a note on i. Hoffmann degradation of amines and ii. Reductive amination
E. What are amines? How are they classified?
F. How will you distinguish primary, secondary and tertiary amines by acetylation reaction?

Q.5. Attempt the following (any four) (20)

A. Define : unit cell, crystal lattice, axis of symmetry, center of symmetry and lattice planes
B. Give a brief account of homogeneous and heterogeneous catalysis
C. Write a note on photochemical smog.
D. What are the sources of Sulphur dioxide?
E. What are diazonium salts? Give the mechanism of diazodization.
F. How is aniline converted to i. Bromobenzene and ii. Phenol