Amity PV.

First Term Exam – 2017-2018

Class – XII

Subject – CHEMISTRY

Time: 3 Hours **Max. Marks: 70**

General Instructions:

(i) All questions are compulsory
(ii) Questions 1-5 are short answer ques. carrying 1M each.
(iii) Questions 6-10 carry 2M each.
(iv) Questions 11-22 carry 3M each.
(v) Question 23 carries 4M.
(vi) Questions 24-26 are long answer questions carry 5M each.
(vii) Use of calculators is not allowed. Use log table if required.

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1. What is the coordination number in a bcc structure? (1)

2. Give one point of difference between order and molecularity. (1)

3. List the reagents required to convert phenol to salicylaldehyde using Reimer Tiemann reaction. (1)

4. Define peptide bond. (1)

5. Two strands of DNA are complementary. What does this mean? (1)

6. Solubility of H_2S in water at STP is 0.195 m. Calculate the Henry's constant for H_2S. (2)

7. Arrange in increasing order of mentioned property (2)

   (a) phenol, p-cresol, p-nitrophenol, cyclohexanol (Ka value)

   (b) sec-butyl alcohol, n-butyl alcohol, tert-butyl alcohol (ease of esterification)

8. Write two points of difference between thermoplastics and thermosetting plastics.

   OR

   Give an example of addition copolymer. Also mention its use.

9. Define limiting molar conductivity. Why does conductivity of an electrolyte solution decrease with the decrease in concentration? What is the relationship between molar conductivity and conductivity? (2)

10. What are Bacteriostatic and Bacteriocidal antibiotics? Give an example of each. (2)

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11. (a) Why is Bithionol added to soap? (3)

(b) Which class of drugs is used in sleeping pills?

(c) What are antiseptics? Give one example.

OR

(a) Which type of detergents are used in liquid dish washers? Give an example.

(b) What are artificial sweeteners? Give an example.

(c) What are antipyretics? Give an example. (3)

12. Write structures of monomers of the following polymers. (3)

(a) Buna-S (b) Nylon-6,6 (c) Dacron

13. Write short notes on

(a) Hinsberg test (b) Coupling reaction (3)

14. Account for the following:

(a) Gabriel phthalimide synthesis is preferred for preparation of primary amines

(b) aniline is a weaker base than ammonia

(c) aniline is converted to acetanilide before bromination (3)

15. (a) Distinguish between following:

(i) acetaldehyde and benzaldehyde

(ii) ethyl benzoate and benzoic acid

(b) Give equation showing reaction of methanal with conc. OH^-. (2+1)

16. Convert:

(a) Phenol to aspirin

(b) ethanol to methanol

(c) ethanol to acetone (3)

17. Give reason

(a) Inspite of being ring deactivators, halogens are o,p-directing (3)

(b) Boiling point of iodoethane is more than that of chloroethane

(c) Thionyl chloride is preferred while preparing haloalkanes from alcohols

18. (a) Write stepwise mechanism for the given reaction: (-)-2-bromooctane reacts with aq. NaOH to form (+)-octan-2-ol (2)

(b) Give structure and IUPAC name of product formed when cyclohexene is treated with Br_2 in presence of UV light. (1)

19. Following data were obtained during first order thermal decomposition of SO_2Cl_2 at constant volume.

$SO_2Cl_2(g) \rightarrow SO_2(g) + Cl_2(g)$

Experiment	Time (s^{-1})	Total pressure (atm)
1	0	0.4
2	100	0.7

Calculate the value of rate constant.

20. For the reaction:

$2NO(g) + Cl_2(g) \rightarrow 2NOCl(g)$

Following data were collected at 263 k.

Expt. Number	Initial [NO]	Initial[Cl_2]	Rate of disappearance of Cl_2 ($molL^{-1}min^{-1}$)
1	0.15	0.15	0.60
2	0.15	0.30	1.20
3	0.30	0.15	2.40
4	0.25	0.25	?

Find the missing data.

21. Molybdenum (atomic mass 96g/mol), has density 10.3 gcm^{-3} and edge length of unit cell is 314 pm. Identify the type of unit cell. (3)

22. Give reason: (3)

(a) KCl heated in K vapours gives violet colour

(b) Si doped with B shows increased conductivity

(c) Old glass objects lose their transparency

23. A major population of Indians is still undernourished or malnourished. On detailed investigation of various such cases, an NGO found a high percentage of people suffering from dermatitis and convulsions in an area. In collaboration with Govt. authorities, they planned to provide food supplements to people and educate them over the issue.

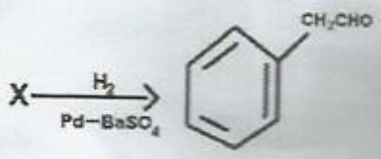
(a) What are vitamins?

(b) Name the vitamin which must be provided through these food supplements.

(c) List two food stuffs rich in this vitamin.

(d) List two values shown by the NGO. (4)

24. (a) Identify X (1)



(b) Identify B and C in the following reaction. (1)

C

Benzene + B → Benzophenone

(c) Why are aromatic aldehydes less reactive than aliphatic ones towards nucleophilic addition reaction? (2)

(d) Write equation showing reaction of cyclopropanone with hydroxylamine. (1)

OR

(a) α-hydrogen of carbonyl compounds is acidic in nature. Explain with a suitable example. (2)

(b) Why are carboxylic acids stronger acids than phenol? (2)

(c) Why do ketones not respond to Fehling's test? (1)

25. (a) An aq. Solution containing 1.248 g $BaCl_2$ (molar mass = 208.34 g/mol) in 100g water boils at 100.0832°C. Calculate the degree of dissociation of $BaCl_2$ (K_b for water = 0.52 K kg/mol) (3)

(b) Define: (i) Colligative property (ii) Azeotrope (2)

OR

(a) Calculate the mass of a non-volatile solute (molar mass = 40g/mol) that should be dissolved in 114g of octane to reduce its vapour pressure to 80%. (3)

(b) State Henry's law. How is used in solving the problem of "bends"? (2)

26. (a) Calculate the emf of given cell at 298K

$Cr(s) \mid Cr^{3+}(0.1M) \parallel Fe^{2+}(0.01M) \mid Fe(s)$

$E^{o}(Cr^{3+} \mid Cr) = -0.75V$, $E^{o}(Fe^{2+} \mid Fe) = -0.45V$ (3)

(b) Give chemical equations for the reactions occurring at respective electrodes during electrolysis of conc. H_2SO_4 solution using Pt electrodes. (2)

OR

(a) Calculate ΔG for the cell reaction at 298K:

$Zn(s) \mid Zn^{2+}(0.0004M) \parallel Cd^{2+}(0.2M) \parallel Cd(s)$

$E^{o}(Zn^{2+} \mid Zn) = -0.76V$, $E^{o}(Cd^{2+} \mid Cd) = -0.403V$ (3)

(b) Alkaline medium slows down the rate of rusting. Explain using suitable chemical equation. (2)