XII-B

3/80

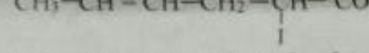
MID TERM EXAMINATION (2017-2018)
CLASS: XII SUBJECT: CHEMISTRY

Time: 3 Hours **Total Marks: 70**

General Instructions:

1. All questions are compulsory.
2. Question numbers 1 to 5 are very short answer questions and carry 1 mark each.
3. Question numbers 6 to 10 are short answer questions and carry 2 marks each.
4. Question numbers 11 to 22 are also short answer questions and carry 3 marks each.
5. Question number 23 carries 4 marks.
6. Question numbers 24 to 26 are long answer questions and carry 5 marks each.
7. As far as possible, attempt in serial order.

1. What are fuel cells?
2. Write IUPAC name of the following compound:



3. Write the structural formula of aspirin.
4. Give the significance of Vant Hoff factor.
5. Illustrate Cumene process.
6. Explain the mechanism of: Acid catalyzed dehydration of an alcohol at 413 K.
7. Name two water soluble vitamins, state their resources & the diseases caused due to their deficiency in diet.
8. State Henry's Law. Give any two applications
9. Out of 0.1 molal solutions of glucose and sodium chloride each, which one will have a higher boiling point and why?
10. What are biodegradable and non- biodegradable detergents? Give one example of each.
11. Answer the following:
    A. What will happen to RBC's when placed in 1% NaCl solution? (1)
    B. 45 grams of ethylene glycol ($C_2H_6O_2$) is mixed with 600 grams of water. Calculate :-
        (a) the freezing point depression
        (b) the freezing point of the solution.(Given K_f for water is 1.86 K Kg/mol) (1+1)
12. Silver forms ccp lattice and X – ray studies of it's crystals show that the edge length of It's unit cell is 408.6 pm. Calculate the density of silver.(Atomic mass = 107.9 u).
13. Distinguish between:
    (i) Butanal & Butanone.
    (ii) Phenol & Benzoic acid
    (iii) Aniline and propanamine (1+1+1)
14. (A) What are the following substances? (1+1)

(i) Invert Sugar
(ii) Polypeptides.

(B) Ionic solids conduct electricity in molten state but not in the solid state. Explain. (1)

15. (a) What is PHBV? Give its one use.
(b) Which order of kinetics do S_N2 reactions follow? Give an example. (2+1)

16. (a) Distinguish between
(i) hcp & ccp
(ii) Octahedral void and tetrahedral void
(b) Give the name and structure of the monomer of Nylon-6 (2+1)

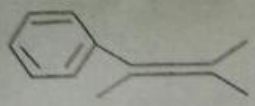
17. (a) Atoms of element B form hcp lattice and those of the element A occupy ⅓rd of the tetrahedral voids. What is the formula of the compound formed by the elements A and B?
(b) Define 12 – 16 compounds with an example. (2+1)

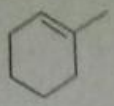
18. The electrical resistance of a column of 0.05 mol/l NaOH solution of diameter 1 cm and length 50 cm is 5.55×10^3 ohm. Calculate it's resistivity, conductivity and molar conductivity.

19. (a) Phenol is more acidic than alcohol. Comment.
(b) Low level of noradrenaline is the cause of depression. What type of drugs are needed to cure this problem? Name two such drugs. (1+2)

20. How are the following conversions carried out?
(a) Aniline to nitrobenzene.
(b) Ethanamine to N-ethylethanamide.
(c) Chloroethane to propan – 1 – amine. (1+1+1)

21. (a) Complete the equations for the following reactions:

(i)  + HBr ⟶

(ii)  + HI ⟶

(b) Grignard reagent is prepared under anhydrous conditions. Comment. (2+1)

22. (a) Distinguish between allylic and benzylic halides with example.
(b) Give any two structural differences between DNA & RNA. (2+1)

23. Rohit needs silicon to make a semi-conductor for his project. He had one impure chip that can be used. He found online the methods to purify the chip for the semi-conductor making. Answer the following questions:
(a) Name the method used for purification. (1)
(b) Give the principle of this method. (1)
(c) Write any two values associated with Rohit's act. (2)

24. (a) State & explain Faraday's second law of electrolysis.
(b) The e.m.f ($E°_{cell}$) for the cell reaction.
$3Sn^{4+} + 2Cr$ --------> $3Sn^{2+} + 2Cr^{3+}$ is 0.89V. Calculate $\Delta G°$ for the reaction.
(c) Explain how rusting is envisaged as setting up of an electrochemical cell. (1+2+2)

25. (a) Write IUPAC name & structural formula of picric acid.

(b) Why does HCOOH not undergo HVZ reaction?
(c) Why is formic acid stronger than acetic acid?
(d) What is protection of amino group? Explain with example. (2+1+1+1)

26. Answer the following:
(a) Distinguish between Buna-N and Buna-S. (2)
(b) What are S_N1 reactions? Give example. (1)
(c) Convert benzoic acid to
(i) Benzaldehyde
(ii) Toluene (1+1)