KARNATAKA BOARD CLASS 12 BIOLOGY PAPER-2019

(English Version)

Instructions : *1. The question paper has four parts. All parts are compulsory.*

2. Part-A carries 10 marks. Each question carries 1 mark.

Part-B carries 10 marks. Each question carries 2 marks.

Part-C carries 15 marks. Each question carries 3 marks.

Part-D carries 35 marks. Each question carries 5 marks.

3. Write balanced chemical equations and draw diagrams wherever necessary.

4. Use log tables and simple calculator if necessary. (Use of scientific calculator is not allowed.)

PART – A

I. Answer **all** the questions. Each question carries **1** mark. (Answer each question in **one word** or in **one sentence**) : **(10 × 1 = 10)**

1) How does the size of blood cells change when placed in an aqueous solution containing more than 0.9% (m/v) sodium chloride?

2) How does the volume change on mixing two volatile liquids to form an ideal solution?

3) Draw a graph of λm V/s $\sqrt{C}$ for acetic acid (weak electrolyte) solution.

4) Unit of rate constant of a reaction is same as that of its rate. What is the order of this reaction?

5) Among physisorption or chemisorption which one has higher enthalpy of adsorption?

6) What is the role of depressant (NaCN) in Froth-Flotation method?

7) Name the noble gas having $ns^2 np^6$ electronic configuration but does not have d-orbitals in its valence shell.

8) Write the general equation for Wurtz reaction.

9) What is the reagent 'A' used in the following equation?

$$R - COOH \xrightarrow{A} R - CH_2OH$$

10) Which vitamin deficiency causes the diseases pernicious anaemia?

PART – B

II. Answer **any five** of the following. Each question carries 2 marks : **(5 × 2 = 10)**

11) Lithium metal has a body centred cubic lattice structure with edge length of unit cell 352 pm. Calculate the density of lithium metal. [Given : Atomic mass of $Li = 7\ gmol^{-1}$, $N_A = 6.022 \times 10^{23}$ Atoms mol^{-1}].

12) State Faraday's second law of electrolysis.

13) What is pseudo-first order reaction? Give an example.

14) How will you account for the following?

i) Actinoids exhibit more number of oxidation states than lanthanoides. **(1)**

ii) Atomic radii of second and third transition series elements are almost identical. **(1)**

15) Explain the Kolbe's reaction with equation.

16) Write the equation for the reaction between benzaldehyde and concentrated NaOH solution. Name the reaction.

17) i) What are anionic detergents? **(1)**

ii) What is the role of saccharin in food? **(1)**

18) Give one example each for the following.

i) Antifertility drugs. **(1)**

ii) Narcotic analgesics. **(1)**

PART – C

III. Answer **any five** of the following. Each question carries **3** marks : **(5 × 3 = 15)**

19) a) In the extraction of Aluminium by electrolysis,

i) Write overall cell reaction. **(1)**

ii) What is the role of cryolite? **(1)**

b) Name the metal refined by Mond's process. **(1)**

20) In the manufacture of ammonia by Haber's process. Write the flow chart and chemical equations with optimum conditions.

21) a) Give reason :

i) Hydrogen bonding in H_2O but not in H_2S. **(1)**

ii) Conc. H_2SO_4 is a good dehydrating agent. **(1)**

b) Give the structure of sulphurous acid (H_2SO_3). **(1)**

22) Complete the following chemical equations

i) $NH_3 + \underset{\text{Excess}}{3Cl_2} \rightarrow ..... + 3HCl$ **(1)**

ii) $Na_2SO_3 + 2HCl \rightarrow 2NaCl + H_2O + ...$ **(1)**

iii) $Br_2 + 3F_2 \rightarrow .....$ **(1)**

23) Write the balanced chemical equation involved in the manufacture of potassium-dichromate from chromite ore.

24) i) What are interstial compounds? **(1)**

ii) Transition metals show good catalytic property. Give any two reasons. **(2)**

25) a) Write the IUPAC name of $K_3[Cr(C_2O_4)_3]$. **(1)**

b) Give the facial (fac) and meridional (mer) isomeric structures of $[Co(NH_3)_3(NO_2)_3]$. **(2)**

26) With the help of Valence Bond Theory (VBT) explain hybridisation, geometry and magnetic property of $[Ni(CN)_4]^{2-}$ tetracyanido nickelate (II) ion. [Given : Atomic number of Ni = 28].

PART – D

IV. Answer **any three** of the following. Each question carries **5** marks : **(3 × 5 = 15)**

27) a) Calculate the packing efficiency in Face Centred Cubic (FCC) lattice. **(3)**

b) What is Frenkel defect? What is its effect on the density of a solid? **(2)**

28) a) 31 g of an unknown molecular material is dissolved in 500 g of water. The resulting solution freezes at 271.14 K. Calculate the molar mass of the material. [Given : K_f for water = 1.86 $KKgmol^{-1}$, T_f° of water = 273 K]. **(3)**

b) What is reverse osmosis? Mention its use. **(2)**

29) a) Write the equations for the reactions taking place at anode and cathode in the Lead-storage battery. **(3)**

b) Calculate the value of ΔrG° at 298 K for the cell reaction.

$3Mg_{(s)} + 2Al^{3+}_{(aq)} \rightarrow 3Mg^{2+}_{(aq)} + 2Al_{(s)}$

[Given ; $E^{\circ}_{Mg} = -2.36$ V, $E^{\circ}_{Al} = -1.66$ V and $F = 96487$ C]. **(2)**

30) a) Derive an integrated rate equation for the rate constant of a first-order reaction. **(3)**

b) The specific reaction rate of a reaction quadruples when temperature changes from 30°C to 50°C. Calculate the energy of activation of the reaction. [Given : $R = 8.314$ $JK^{-1}mol^{-1}$]. **(2)**

31) a) Define shape selective catalysis. Name the Zeolite catalyst used to convert alcohols to gasoline in petroleum industry. **(2)**

b) What is peptisation? Give an example. **(2)**

c) Write the expression for Freundlich adsorption isotherm. **(1)**

V. Answer **any four** of the following. Each question carries **5** marks : **(4 × 5 = 20)**

32) a) Write the equations for the steps involved in the S_N1 mechanism of hydrolysis of 2-bromo 2-methyl propane . **(2)**

b) i) Name the product formed for the reaction of isopropyl iodide on alcoholic KOH. **(1)**

ii) What is the condition to be satisfied for a compound to be chiral? **(1)**

c) What is racemic mixtures? **(1)**

33) a) Explain the mechanism of acid catalysed dehydration of ethanol to ethene. **(3)**

b) How do you prepare methoxy ethane by Williamson's ether synthesis? **(2)**

a) How does benzene reacts with acetyl-chloride in the presence of anhydrous $AlCl_3$? Give equation. **(2)**

b) i) Write general equation for esterification reaction. **(1)**

ii) Name the product obtained when benzoic acid is heated with ammonia. **(1)**

c) Name the reagent used in the Clemmensen reduction. **(1)**

35) a) Between CH_3NH_2 and $C_6H_5NH_2$ which is more base? Give reason. **(2)**

b) i) Name the main product when aniline is heated with alcoholic KOH and chloroform. **(1)**

ii) Give the IUPAC name of $(CH_3)_2N-C_2H_5$. **(1)**

c) Complete the chemical equation.

$CH_3CONH_2 \xrightarrow{Br_2/NaOH}$ **(1)**

36) a) Write the Haworth structure of maltose. **(2)**

b) What is peptide linkages? How many peptide bonds are present in a tetra-peptide? **(2)**

c) Name the hormone which regulates blood sugar level in the body. **(1)**

37) a) How is Buna-N prepared? Give equation. **(2)**

b) Name the monomers of Nylon-6, 6. **(2)**

c) What are thermosetting polymers? **(1)**