SWAMI VIVEKANAND ACADEMY

Chak chariya, Majhawa, Kachhawa, Mirzapur

Class – XII – Chemistry –Test Paper – Date: 24.12.2019

General Instructions:

(i) All questions are compulsory.

(ii) This question paper contains 37 questions.

*(iii) Questions 1 – 20 in **Section A** are objective type-very short answer type questions carrying **1 mark** each.*

*(iv) Questions 21 – 27 in **Section B** are short answer type questions carrying **2 marks** each.*

*(v) Questions 28 – 34 in **Section C** are long-answer I type questions carrying **3 marks** each.*

*(vi) Questions 35 – 37 in **Section D** are long-answer II type questions carrying **5 marks** each.*

(vii) 33% internal choices have been given in each sections.

Section 'A'

1. A narrow spectrum antibiotic is active give a space after against _____ .

   (a) Gram-positive or Gram-negative bacteria.

   (b) Gram-negative bacteria only.

   (c) Single organism or one disease.

   (d) Both Gram-positive and Gram-negative bacteria. 1

   OR

   Which of the following statements is not true about glucose?

   (a) It is an aldohexose.

   (b) On heating with HI it forms *n*-hexane.

   (c) It is present in furanose form.

   (d) It does not give 2,4-DNP test. 1

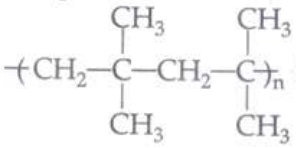
AI 2. Maximum amount of a solid solute that can be dissolved in a specified amount of a given liquid solvent does not depend upon ..... .

   (a) temperature

   (b) nature of solute

   (c) pressure

   (d) pressure of solvent 1

3.  is a polymer having monomer units:

(a) =<

(b) 

(c) 

(d) 

1

4. In the metallurgy of aluminium :
   (a) Al^{3+} is oxidised to Al (s).
   (b) graphite anode is oxidised to carbon monoxide and carbon dioxide.
   (c) oxidation state of oxygen changes in the reaction at anode.
   (d) oxidation state of oxygen changes in the overall reaction involved in the process. 1

OR

The magnetic moment is associated with its spin angular momentum and orbital angular momentum. Spin only magnetic moment value of Cr^{3+} ion is

(a) 2.87 BM
(b) 3.87 BM
(c) 3.47 BM
(d) 3.57 BM 1

5. Which of the following process does not occur at the interface of phases?
   (a) Crystallisation
   (b) Heterogeneous catalysis
   (c) Homogeneous catalysis
   (d) Corrosion 1

OR

Which of the following statement is false?

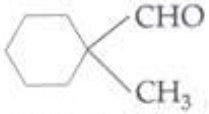
(a) Two different solutions of sucrose of same molality prepared in different solvents will have the same depression in freezing point.

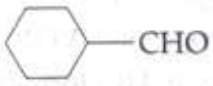
(b) The osmotic pressure of a solution is given by the equation $\pi = CRT$ (where C is the molarity of the solution).

(c) Decreasing order of osmotic pressure for 0.01 M aqueous solutions of barium chloride, potassium chloride, acetic acid and sucrose is
$BaCl_2 > KCl > CH_3COOH >$ sucrose.

(d) According to Raoult's law, the vapour pressure exerted by a volatile component of a solution is directly proportional to its mole fraction in the solution. 1

6. Cannizzaro reaction is not given by_____

(a) 

(b) 

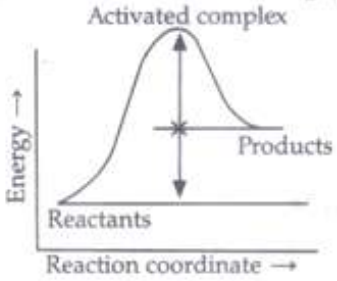
(c) HCHO

(d) CH_3CHO 1

7. Monochlorination of toluene in sunlight followed by hydrolysis with aq. NaOH yields.
   (a) *o*-Cresol
   (b) *m*-Cresol
   (c) 2, 4-Dihydroxytoluene
   (d) Benzyl alcohol 1

8. Which reagent will you use for the following reaction?
$CH_3CH_2CH_2CH_3 \longrightarrow CH_3CH_2CH_2CH_2Cl + CH_3CH_2CHClCH_3$
   (a) Cl_2/UV light
   (b) $NaCl + H_2SO_4$
   (c) Cl_2 gas in dark
   (d) Cl_2 gas in the presence of iron in dark. 1

9. Consider the following figure and mark the correct option :



(a) Activation energy of forward reaction is $E_1 + E_2$ and product is less stable than reactant.

(b) Activation energy of forward reaction is $E_1 + E_2$ and product is more is stable than reactant.

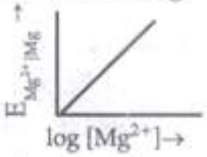
(c) Activation energy of both forward and backward reaction is $E_1 + E_2$ and reactant is more stable than product.

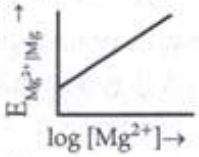
(d) Activation energy of backward reaction is E_1 and product is more stable than reactant. 1

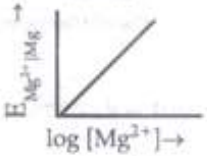
10. Electrode potential for Mg electrode varies according to the equation:

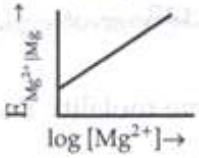
$$E_{Mg^{2+}/Mg} = E^{\ominus}_{Mg^{2+}/Mg} - \frac{0.059}{2} \log \frac{1}{[Mg^{2+}]}$$

The graph of $E_{Mg^{2+}/Mg}$ vs. log $[Mg^{2+}]$ is

(a) 

(b) 

(c) 

(d) 

11. Arrange the following polymers in the increasing order of their intermolecular forces : Terylene, Polythene, Neoprene. 1

12. Explain the following :

The enthalpies of atomization of transition metals are quite high. 1

OR

Zinc oxide can be reduced to metal by heating with carbon but Cr_2O_3 cannot be reduced by heating with carbon. 3

13. Which one of the following compound is more easily hydrolyzed by KOH and why ?

$CH_3CHClCH_2CH_3$ Or $CH_3CH_2CH_2Cl$ 1

14. Which of the following is a fibre : Nylon, Neoprene, PVC? 1

15. Account for the following: Iron on reaction with HCl forms $FeCl_2$ and not $FeCl_3$. 1

16. Write IUPAC name of the following compound: $(CH_3)_2N–CH_2CH_3$ 1

OR

Write the chemical reaction to explain Kolbe's reaction. 1

17. Following compounds are given to you :

2-Bromopentane, 2-Bromo-2-methylbutane, 1-Bromopentane

Write the compound which is most reactive towards β-elimination reaction. 1

18. Lyophilic sol is more stable than lyophobic sol. Why? 1

19. Write the chemical reaction which takes place in Mond's process for refining of nickel. 1

20. Why water cannot be completely separated from aqueous solution of ethyl alcohol ? 1

OR

Why is Tyndall effect shown by colloidal solutions ? 1

Section 'B'

21. Give two requirements for vapour phase refining. 2

OR

Explain the following observations :

(i) Copper atom has completely filled *d* orbitals ($3d^{10}$) in its ground state, yet it is regarded as a transition element.

(ii) Cr^{2+} is a stronger reducing agent than Fe^{2+} in aqueous solution. 2

22. (i) What is the effect of temperature on the solubility of a gas in a liquid?

(ii) Mention two important applications of Henry's Law. 2

23. (i) Arrange the following in order of property indicated for each set :

F_2, Cl_2, Br_2, I_2 – increasing bond dissociation enthalpy.

(ii) Write the order of thermal stability of the hydrides of Group 16 elements. 2

24. Which of the following solutions has higher freezing point? 0.05 M $Al_2(SO_4)_3$, 0.1 M $K_3[Fe(CN)_6]$ Justify. 2

OR

The conductivity of 0.20 M solution of KCl at 298 K is 0.025 S cm^{-1}. Calculate its molar conductivity. 2

25. (a) If half-life period of a first order reaction is x and $3/4^{th}$ life period of the same reaction is y, how are x and y related to each other ?

(b) In some cases it is found that a large number of colliding molecules have energy more than threshold energy, yet the reaction is slow. Why ? 2

26. Draw the structure of the following molecules :

(a) $H_2S_2O_7$

(b) $XeOF_4$ 2

27. Define the following terms :

(i) Pseudo first order reaction.

(ii) Half-life period of a reaction ($t_{½}$). 2

Section 'C'

28. Write the therapeutic action of following on human body and mention the class of drugs to which each of these belong :

(i) Ranitidine

(ii) Morphine

(iii) Aspirin 3

29. (i) $[Ni(CN)_4]^{2-}$ is diamagnetic whereas $[NiCl_4]^{2-}$ is paramagnetic. Give reason. (At. no. of Ni = 28)

(ii) The molecular shape of $Ni(CO)_4$ is not the same as that of $[Ni(CN)_4]^{2-}$. Give reason.

(iii) Why are low spin tetrahedral complexes not formed? 3

30. An organic aromatic compound 'A' with the molecular formula C_6H_7N is sparingly soluble in water. 'A' on treatment with dil HCl gives a water-soluble compound 'B'. 'A' also reacts with chloroform in presence of alcoholic KOH to form an obnoxious smelling compound 'C'. 'A' reacts with benzene sulphonyl chloride to form and alkali soluble compound 'D'. 'A' reacts with $NaNO_2$ and HCl to form a compound 'E' which on reaction with phenol forms an orange dye 'F'. Elucidate the structures of the organic compounds from 'A' to 'F'. 3

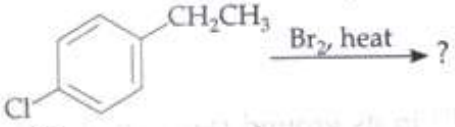
31. (i) Write the mechanism of the following reaction :

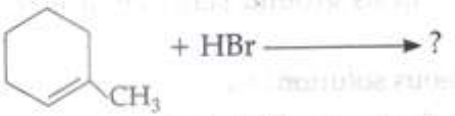
$$2CH_3CH_2OH \xrightarrow{H^+} CH_3CH_2 - O - CH_2CH_3$$

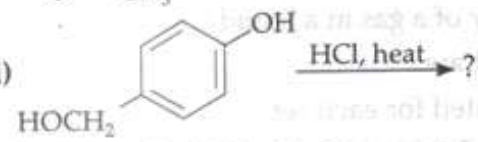
(ii) Write the equations involved in the acetylation of Salicylic acid. 3

OR

Draw the structures of the major monohalo product for each of the following reactions :

(i) 

(ii) 

(iii)  3

32. (i) Explain why is O=C=O nonpolar while R–O–R is polar.

(ii) An alkoxide is a stronger base than hydroxide ion. Justify. 3

33. (i) Write the name of the cell which is generally used in transistors. Write the reactions taking place at the anode and the cathode of this cell.

(ii) Write the products of electrolysis of aqueous solution of NaCl with platinum electrodes. 3

34. Predict the products of the following reactions :

(i) $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\underset{|}{\overset{|}{C}}}}=O \xrightarrow[\text{(ii) KOH/Glycol, } \Delta]{\text{(i) } H_2N-NH_2} ?$

(ii) $C_6H_5-CO-CH_3 \xrightarrow{NaOH/I_2} ? + ?$

(iii) $CH_3COONa \xrightarrow[\Delta]{NaOH/CaO} ?$ 3

OR

Draw the structure and name the product formed if the following alcohols are oxidized. Assume that an excess of oxidizing agent is used.

(i) $CH_3CH_2CH_2CH_2OH$

(ii) 2-butanol

(iii) 2-methyl-1-propanol 3

Section 'D'

35. Write the structures of fragments produced on complete hydrolysis of DNA. How are they linked in DNA molecule? Draw a diagram to show pairing of nucleotide bases in double helix of DNA. 5

OR

Some alkylhalides undergo substitution whereas some undergo elimination reaction on treatment with bases. Discuss the structural features of alkyl halides with the help of examples which are responsible for this difference. 5

36. (a) Out of 1 M glucose and 2 M glucose, which one has a higher boiling point and why ?

(b) What happens when the external pressure applied becomes more than the osmotic pressure of solution ?

(c) Explain the terms ideal and non-ideal solutions in the light of forces of interactions operating between molecules in liquid solutions. 5

OR

(i) How can we get the following colloidal solutions :

(a) Silver in water

(b) Sulphur in water

(c) $Fe(OH)_3$ in water

(d) Gold in water

(ii) List two applications of adsorption.

(iii) What happens when

(a) an emulsion is centrifuged ?

(b) electric current is passed through a colloidal solution ? 5

37. A violet compound of manganese (A) decomposes on heating to liberate oxygen and compounds (B) and (C) of manganese are formed. Compound (C) reacts with KOH in the presence of potassium nitrate to give compound (B). On heating compound (C) with conc. H_2SO_4 and NaCl, chlorine gas is liberated and a compound (D) of manganese along with other products is formed. Identify compounds A to D and also explain the reactions involved. 5