

# BSC. PART - II EXAMINATION - 2008

## CHEMISTRY SUB/GEN

Answer six questions, selecting at least one from each Group and Q.No 1 is compulsory

1. Choose the correct choice in the following

(a) Half life period of a reaction is inversely proportional to the initial concentration of the reactant, the order of a reaction is: (i) 1 (ii) 2 (iii) 3 (iv) zero

(b) The unit of specific conductance is

(i)  $\text{ohm}^{-1} \text{cm}^{-1}$  (ii)  $\text{ohm}^{-1} \text{cm}^{-3} \text{equi}^{-1}$  (iii)  $\text{ohm}^{-1} \text{cm}^{-2} \text{mol}^{-1}$

(c) Strong electrolyte is

(i)  $\text{CH}_3\text{COOH}$  Solution (ii)  $\text{NH}_4\text{OH}$  Solution  
(iii)  $\text{HCl}$  Solution (iv)  $\text{H}_3\text{PO}_4$  Solution

(d) The shape of  $\text{sp}^3\text{d}^2$  hybrid atom is

(i) Tetrahedral (ii) Pentagonal bipyramid (iii) Octahedral (iv) None of these

(e) Molten sodium chloride conducts electricity due to the presence of

(i) Free ions (ii) Free molecules  
(iii) Free electrons (iv) Atoms of sodium and chlorine

(f) Which of the following is most abundant in air?

(i) He (ii) Ne (iii) Ar (iv)  $\text{CO}_2$

(g) Which of the following does not contain -COOH group?

(i) Formic acid (ii) Lactic acid (iii) Picric acid (iv) Chloroacetic acid

(h) Oxalic acid reacts with glycerol at  $110^\circ\text{C}$  to give

(i) Acrolein (ii) Formic acid (iii) Allyl alcohol

(i) The reaction of formaldehyde with  $\text{NaOH}$  to give  $\text{CH}_2\text{OH}$  and  $\text{HCOO}^- \text{Na}^+$  is

(i) Perkin reaction (ii) Kolbe reaction (iii) Cannizzaro reaction

(j) Which of the following is optically inactive?

(i) Citric acid (ii) Lactic acid (iii) Tartaric acid (iv) None of these

### GROUP - A

2. (a) Explain molecularity and order of a reaction. What is the difference between them?

(b) Obtain an expression for the rate constant of a first order reaction.

3. (a) Explain Ostwald's dilution law and discuss its limitations.

(b) A 0.10 M solution of ammonium hydroxide is 1.3% ionized at  $25^\circ\text{C}$ .

Calculate the dissociation constant of ammonium hydroxide.

4. (a) Explain isotopes, isobars and isotones. (b) Discuss radiocarbon dating.

5. (a) What are the factors which influence the rate of a reaction?

(b) Discuss the effect of temperature on such rates.

(c) What do you mean by rate determining step?

### GROUP - B

6. How potassium permanganate is obtained from pyrolusite? Calculate its equivalent weight in acidic medium. How does  $\text{KMnO}_4$  react with solution of:

(i)  $\text{KI}$  (ii)  $\text{H}_2\text{S}$

7. Name two important ores of Cobalt. How pure Cobalt is extracted from its ore?

8. Write notes on any two of the following (a) Heisenberg Uncertainty Principle

(b) Hydrazoic acid (c) Nitrogenous fertilizers

9. Discuss two methods for the preparation of sodium thiosulphate. How does sodium thiosulphate react with (a)  $\text{HCl}$  (b)  $\text{I}_2$  (c)  $\text{FeCl}_3$

### GROUP C

- 10 (a) How will you synthesise citric acid from propylene?  
(b) How citric acid is isolated from lemon juice?  
(c) How does citric acid react with (a) Acetyl Chloride (ii) Fuming  $H_2SO_4$
11. Bring out the following conversions  
(i) Glucose to fructose and vice-versa (ii) Glucose to Arabinose and vice-versa
12. How benzene diazonium chloride is prepared? How will you convert benzene diazonium chloride into?  
(i) Benzene (ii) Phenol (iii) Phenylhydrazine (iv) Nitrobenzene
13. Write notes on any two of the following  
(a) Friedel – Craft's reaction (b) Perkin reaction (c) Sandmeyer's reaction

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