

**HSEB-GRADE XII****2073 (2016)****Chemistry****Sub.Code : 212'D'**

*Candidates are required to give their answer in their own words as far as practicable. The figures in the margin indicate full marks.*

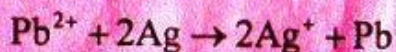
**Time : 3 hrs.****Full Marks:- 75****Pass Marks:- 27****Group 'A'****Attempt any fifteen questions:****15x2=30**

1. Ammonia molecule has got trigonal pyramidal geometry even though nitrogen of ammonia gets  $sp^3$  hybridization. Give reason. **2**

2. Why is crystal oxalic acid regarded as a good substance for the preparation of primary standard solution? **2**

3. Define: **1+1**  
(i) Degree of ionisation.  
(ii) Ostwald's dilution law.

4. Predict whether the following reaction will occur spontaneously or not. Why? **1+1**

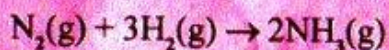


given,

$$E^{\circ}_{Ag^+/Ag} = 0.80V$$

$$E^{\circ}_{Pb^{2+}/Pb} = -0.13V$$

5. What is meant by enthalpy of reaction? If standard enthalpy of formation of ammonia is  $46KJ\ mol^{-1}$ , what is the enthalpy change of the following reaction? **1+1**



6. Under what conditions is the reaction expected to occur **1+1**  
(i) spontaneous (ii) non-spontaneous, if  $\Delta H$  and  $\Delta S$  are negative.

7. What are the essential conditions for the effective collision of reacting species? **2**

8. Starting from phenol how would you obtain cyclohexane. **2**

**Contd...**

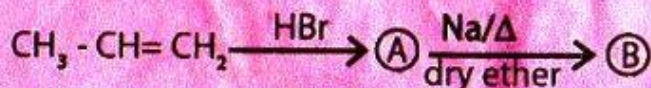




212'D'

(2)

9. Identify (A) and (B) in the following sequence of the reaction and give their IUPAC Name. 2



10. How is phenol obtained from 1+1  
(i) benzene diazonium chloride  
(ii) chlorobenzene

11. Write down an isomeric ether of isopropyl alcohol. What happens when the isomeric ether is heated with excess HI? 1+1

12. Write an example of 1+1  
(i) Cannizzaro's reaction  
(ii) Aldol Condensation

13. Why is chloroacetic acid stronger acid than acetic acid? 2

14. What happens when Nitrobenzene is 1+1  
(i) subjected to electrolytic reduction  
(ii) treated with Zn/NaOH

15. Give a suitable chemical test to distinguish ethanamine from N-methylmethanamine. 2

16. Distinguish between homopolymer and co-polymer with an example of each. 1+1

17. Write down the structure of 1+1  
(i) aspirin  
(ii) Paracetamole  
and mention their one use of each.

18. Illustrate the formation of peptide bond with an example. 2

19. What are non-reducing sugars? Write an example of it. 1+1

20. Write the action of heat on blue vitriol. 2

21. Give the reactions for the extraction of metallic zinc from zinc blende. 2

22. Write down chemical reactions that occur in zone of reduction of blast furnace during extraction of iron. 2

Contd...





(3)  
Group 'B'

212'D'

Attempt any five questions.

5x5=25

23. State Faraday's laws of electrolysis. Establish relationship between electro-chemical equivalent and chemical equivalent.

0.197 gm of copper is deposited by a current of 0.2A in 50 minutes. Calculate its electrochemical equivalent.

2+1+2

24. Define redox titration.

10 gm of NaOH was added to 200 cc of  $\frac{N}{2}$  ( $f=1.5$ )  $H_2SO_4$ . The volume was diluted to two litres. Predict whether the dilute solution is acidic, basic or neutral and also calculate the resulting molarity of the dilute solution.

1+2+2

25. Write down the chemistry of calomel.

5

26. Define rate law. The reaction  $P+Q \rightarrow Z$  is first order with respect to P and zero order with respect to Q. If so, fill in the blanks in the following.

1+4

Expt	[P] M	[Q] M	initial rate of formation [Z] M min <sup>-1</sup>
I	0.1	0.1	$2 \times 10^{-2}$
II	-	0.2	$4 \times 10^{-2}$
III	0.4	0.4	-
IV	-	0.2	$2 \times 10^{-2}$

27. Describe the laboratory method of preparation of ethoxyethane. What happens when ethoxyethane is exposed to air?

4+1

28. Give chemical reactions for the preparation of ethanal from (i) 1, 1-dibromo ethane (ii) ethyne (iii) ethanoyl chloride. How is ethanal converted into propan-2-ol?

3+2

29. An aliphatic compound (A) reacts with  $SOCl_2$  to give (B). (B) on dehydrohalogenation yields (C). The compound (C) on ozonolysis gives a mixture of ethanal and methanal. If (A) is an alcohol which responds iodoform test. Identify (A), (B) and (C). What product would you expect when compound (B) is heated with  $H_2/Ni$ ?

5

Contd...





212'D'

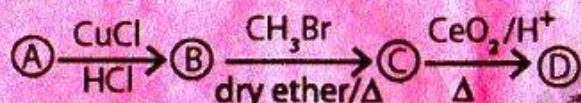
(4)

Group 'C'

Attempt any two questions.

2x10=20

30. How is pure and dry aniline prepared in the laboratory? Identify the major products (A), (B), (C) and (D) in the following reaction sequences. 6+4



The compound D undergoes clemmensen reduction to give Toluene.

31. How would you distinguish propan-2-ol from 2-methyl propan-2-ol by using Victor Meyers method. Write down suitable method for the conversion of: 5+2.5+2.5

- (i) Chloroform into dimethylamine.  
(ii) Ethanamine into methanamine.

32. State solubility product constant. What is the proper condition of precipitation of salt from its solution? Explain application of the solubility product principle and common ion effect. What is the minimum volume of water required to dissolve 1 gm of calcium sulphate at 298K? 1+1+4+4  
[given, solubility product ( $K_{sp}$ ) for  $\text{CaSO}_4 = 9.1 \times 10^{-6}$ ]

33. Write short notes on any two:

2x5=10

- (i) Extraction of blister copper from copper pyrites.  
(ii) Rusting of iron  
(iii) Hess's law of constant heat summation and its applications.  
(iv) Laboratory preparation of formic acid.