



Sub.Code : 112'D'

**HSEB-GRADE XI****2073 (2016)****Chemistry****(New and Old Course)**

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. Calculate the mass of the following: 1+1
  - (i) 4 atom of carbon
  - (ii) 3 molecule of hydrogen
2. State law of Constant Composition giving a suitable example. 2
3. Define discontinuous solubility curve. What types of salt are responsible for such curves? 1+1
4. Mention any two important characters of each of the following: 1+1
  - (i) Efflorescent substance
  - (ii) Amorphous solid
5. Assign the value of the quantum number  $n$ ,  $l$  and  $m$  for the outermost electron in sodium atom. 1+1
6. Write down the electronic configuration of 1+1
  - (i)  $Al^{3+}$
  - (ii) S.
7. Define nuclear fusion reaction giving an example. 1+1
8. Draw the Lewis structure of 1+1
  - (i)  $H_2SO_3$
  - (ii)  $N_2O$ .
9. Each carbon-oxygen bond in  $CO_2$  is polar but  $CO_2$  molecule is non-polar. Explain proper reason. 1+1
10. Predict which of the following pair has larger electron affinity and why? 2  
O and F.
11. Define oxidation number. What is the oxidation number of P in  $NaH_2PO_2$ ? 1+1

Contd...

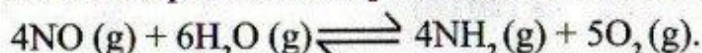




112'D

(2)

12. Write the expression for equilibrium Constant ( $K_c$ ) for the following reaction:



What is the relationship between  $K_p$  and  $K_c$  for the above reaction? 1+1

13. What is nascent hydrogen? Mention an example to show nascent hydrogen is more powerful reducing agent than molecular hydrogen. 1+1

14. How does the formation of ozone take place in stratosphere? Give any two uses of ozone. 1+1

15. What happens when the gas obtained by heating methanoic acid and conc. sulphuric acid is heated with  $\text{Fe}_2\text{O}_3$ ? 2

16. How is  $\text{SO}_2$  responsible for acid rain? 2

17. 'Every ore is mineral but every mineral is not ore'. Give reason. 2

18. Give a balanced chemical reaction for the preparation of slaked lime. How would you obtain lime water from slaked lime. 1+1

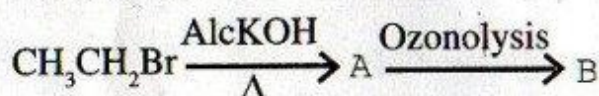
19. Give the structure of the following compounds: 1+1

(i) 2, 3-dimethyl but-2-ene

(ii) ethylethanoate

20. How is an electrophile differed from nucleophile? Give a suitable example of each. 1+1

21. Identify the major products A and B in the following reaction sequence and give their IUPAC name. 1+1



22. How would you prepare methane from 1+1

(i) chloromethane

(ii) sodium ethanoate

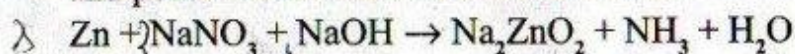
### Group 'B'

Attempt any five questions.

5x5=25

23. What property did Mendeleev use to classify the element in his periodic table? Point out the anomalies in the Mendeleev's periodic table. 1+4

24. Balance the following equation by oxidation number or ion-electron method and point out the oxidant and reductant: 5



Contd...





(3)

112'D'

25. ✓ How is ethene prepared in the laboratory? What happens when ethene is passed through Baeyer's reagent? 4+1

26. ✓ Starting from sulphur, how would you obtain sulphuric acid (reaction only).

How does conc.  $H_2SO_4$  react with : 2+1+1+1

(i) Sugar (ii)  $P_4$ .

Why is conc. sulphuric acid diluted by adding acid to water but not water to acid?

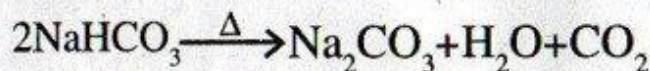
27. Differentiate between : 2.5+2.5

(i) Calcination and roasting

(ii) Carbon-reduction process and thermite process.

28. Describe the preparation of bromine from carnallite. What happens when bromine is passed through hot and conc. NaOH ? 4+1

29. ✓ For a reaction: 2+1+2



2.5gm of a sample  $NaHCO_3$  when strongly heated gives 310cc of  $CO_2$  at  $27^\circ C$  and 760 mmHg pressure.

(i) ✓ Calculate the percentage purity of the sample ( $NaHCO_3$ )

(ii) ✓ How many moles of water produced in the reaction?

(iii) ✓ What mass of pure HCl is required to neutralize  $Na_2CO_3$  produced in the reaction?

### Group 'C'

Attempt any two questions.

2x10=20

30. ✓ State Charle's Law. How did this law lead to the development of the absolute temperature scale? Plot temperature-volume relationship indicating absolute zero.

A saturated hydrocarbon ( $C_nH_{2n+2}$ ) diffuses through a porous membrane twice as fast as sulphurdioxide . Determine the molecular formula of the hydrocarbon. 1+4+1+4

Contd...





112'D'

(4)

31. Sketch a well-labeled diagram for the manufacture of Caustic Soda (NaOH) by Castner Kellner's process. Explain the principle and procedure involve on it. What happens when Caustic Soda is: 6+1+1+2

(i) heated with Sulphur.

(ii) treated with Zinc

How would you convert Caustic Soda into Sodium Silicate?

32. Write the principle and process involved along with self-explanatory diagram for the manufacture of nitric acid by catalytic oxidation of ammonia. How does concentrated nitric acid react with: 6+1.5+1.5+1

(i) iron (ii) iodine.

Why is conc. nitric acid stored in dark bottle?

33. Write short notes on any two: 2x5=10

(i) Rutherford atomic model

(ii) Le-Chatelier's principle and its applications.

(iii) Characteristics of homologous series.

(iv) Lassaigne's test for nitrogen.

-0-