

HIMACHAL PRADESH BOARD OF SCHOOL EDUCATION, DHARAMSHALA
Model Question Paper
Class – 11th

Duration – 03:00 Hr

Chemistry(Theory)

M.M.: 60

Instructions:

- i) The question paper consists of four sections- A, B, C and D.*
- ii) Internal choices are given in some questions.*
- iii) Section A contains 12 MCQ 1 to 12 of 1 mark each.*
- iv) Section B contains 9 questions from 13 to 21 of 2 marks each.*
- v) Section C contains 6 questions from 22 to 27 of 3 marks each.*
- vi) Section D contains 3 questions from 28 to 30 of 4 marks each.*
- vii) Make neat and clean diagrams where required.*

Section A (1X12)

Q.1 One mole of oxygen molecule is equal to

- a) 6.023×10^{23} atoms of oxygen b) 6.023×10^{-23} atoms of oxygen
- c) 6.023×10^{23} molecules of oxygen d) 6.023×10^{-23} molecules of oxygen

Q.2 3d orbitals have values

- a) $n=2, l=3$ b) $n=3, l=0$
- c) $n=3, l=1$ d) $n=3, l=2$

Q. 3 Which of the following elements has maximum electron gain enthalpy

- a) F b) Cl c) Br d) I

Q.4 Pyramidal geometry associated with

- a) CH_4 b) NH_3 c) H_2O d) CO_2

Q.5 Decreasing order of bond angle in H_2O , NH_3 and CH_4

- a) $\text{CH}_4 > \text{NH}_3 > \text{H}_2\text{O}$ b) $\text{NH}_3 > \text{H}_2\text{O} > \text{CH}_4$
- c) $\text{CH}_4 > \text{H}_2\text{O} > \text{NH}_3$ d) $\text{H}_2\text{O} > \text{CH}_4 > \text{NH}_3$

Q.6 According to Boyle's law

- a) At constant T, $V \propto P$ b) At constant T, $V \propto 1/P$
- c) At constant P, $V \propto T$ d) At constant T, $P \propto T$

Q.7 For the reaction $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$

- a) $\Delta H = \Delta U$ b) $\Delta H > \Delta U$ c) $\Delta H < \Delta U$ d) $\Delta H \neq \Delta U$

Q.8 Conjugate acid of base OH^- is

- a) H_3O^+ b) H_2O c) H^+ d) none of above

Q.9 Lithium shows diagonal relationship with

- a) Mg b) Be c) Al d) B

Q.10 Functional group $-\text{O}-$ belongs to the family of

- a) ketone b) aldehyde c) ether d) alcohols

Q.11 Lassaigne's test is not shown by

- a) Diazonium salt b) Nitrogen c) Sulphur d) Chlorine

Q.12 Free radicals are formed by

- a) homolytic fission. b) heterolytic fission. c) fusion.
e) none of above.

(1x12=12)

Section B (2X9)

Q.13 i) What do you mean by significant figures?

ii) Number of significant figures in 0.005030 are (1,1)

Q.14 i) Define atomic number.

ii) Give electronic configuration of $\text{Cr}(Z=24)$ atom. (1,1)

Q. 15 Derive de Broglie equation. OR

Explain why half filled and completely filled orbital have extra stability. (2)

Q.16 Explain radius of positive ion is always smaller than that of parent atom. (2)

Q.17 State and explain Dalton's law of partial pressure.

OR

A gas occupies 200mL at a pressure of 0.820 bar at 20°C . How much volume will it when it is subjected to external pressure of 1.025 bar at same temperature ? (2)

Q.18 Derive relationship between K_c and K_p . (2)

Q.19 i) Give the general electronic configuration of group 13 elements.

ii) Solid carbon dioxide is called (1,1)

Q.20 i) Complete the reaction $\text{CH}_2=\text{CH}_2 + \text{O}_3 \rightarrow \dots + \dots$

ii) Give Aromatisation reaction. (1,1)

Q.21 i) What is acid rain?

ii) What are the harmful effects of acid rain? (1,1)

Section C (3X6)

Q. 22 Draw molecular orbital diagram of oxygen molecule. Calculate

its bond order. **OR**

On the basis of VSEPR theory, discuss the shape of NH_3 molecule. (3)

Q.23 i) Calculate pH value of 0.01 M NaOH.

ii) Define common ion effect. (2,1)

Q.24) i) Define oxidation number. Find oxidation number of Mn in MnO_4^- .

ii) What is electrochemical cell? (2,1)

Q.25) i) Why H_2S is gas, but H_2O is liquid ?

ii) Permanent hardness of water is due to presence of (2,1)

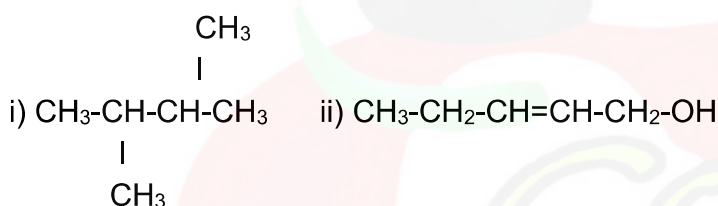
Q.26 Explain

i) Why alkali metals give blue colour in liquid ammonia ?

ii) What is the action of heat on Gypsum? (2,1)

Q.27 i) Define functional group.

ii) Give IUPAC name of organic compounds



(1,1,1)

Section C (4X3)

Q.28 i) Prove that $\Delta H = \Delta U + \Delta n_g RT$.

ii) Define exothermic and endothermic reactions.

(2,2)

Q.29 i) Discuss the structure of Diborane.

ii) CCl_4 cannot be hydrolyzed but SiCl_4 can be . Explain.

OR

i) Why CO_2 is gas but SiO_2 is solid? Explain.

ii) What are fullerenes? How are they prepared? (2,2)

Q.30 explain (any four)

i) What is Wurtz reaction?

ii) What is Markovnikov rule?

iii) Give Friedel Craft Reaction ?

iv) Draw the conformations of ethane.

v) What is pyrolysis?

(1,1,1,1)