

WBSCTE DIPLOMA QUESTION PAPER
FIRST YEAR COMMON FOR ALL BRANCHES
BASIC CHEMISTRY DEC 2017

1. Choose the correct answer from the given alternatives (any twenty):

i) sp^2 hybridisation is known as

- (a) $BeCl_2$ (b) CCl_4 (c) BCl_3 (d) NH_3

ii) Permutit is the sodium salt of

- (a) Al, Si & O (b) B, Si & O (c) C, B, O (d) C, O

iii) The compound can be prepared is

- (a) F_2O_5 (b) OF_6 (c) NCl_5 (d) SF_6

iv) The primary standard solution is prepared by

- (a) oxalic acid (b) hydrochloric acid (c) sulphuric acid (d) sodium hydroxide

v) Rectified spirit is

- (a) 96% ethyl alcohol (b) 95.6% ethyl alcohol

- (c) 98% ethyl alcohol (d) 100% ethyl alcohol

vi) In Rutherford's experiment of atomic model the screen behind the gold foil contains

- (a) CdS (b) Ni_2O_3 (c) ZnS (d) Na_2S

vii) Functional group isomer of ethyl alcohol is

- (a) acetic acid (b) ethanol (c) dimethyl ether (d) methyl format

viii) The metal cannot be extracted by carbon-reduction process is

- (a) lead (b) zinc (c) iron (d) aluminum

ix) Which quantum number represents sub-shell

- (a) principal (b) azimuthal (c) magnetic (d) spin

x) In graphite, the layers are held by force, called

- (a) hydrogen bond (b) van der Waals (c) covalent bond (d) co-ordinate bond

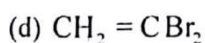
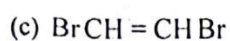
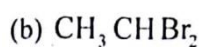
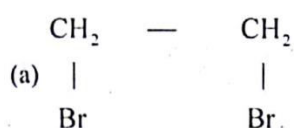
xi) The effective number of Na^+ and Cl^- ions in the unit cell is

- (a) 5 (b) 3 (c) 2 (d) 4

xii) The impurity in iron extraction is

- (a) SiO_2 (b) Al_2O_3 (c) ZnO (d) CuO

xiii) Reaction of ethylene and Br_2 gives



xiv) Phenolphthalein is the correct indicator for titration

- (a) $NH_4OH \sim H_2SO_4$ (b) oxalic acid \sim sodium hydroxide

- (c) sodium hydroxide and acetic acid (d) $\text{NH}_4\text{OH} \sim \text{HCl}$
- xv) Hardness of water is expressed in terms of salt
(a) MgCO_3 (b) CaCO_3 (c) FeCO_3 (d) FeCl_2
- xvi) Acidic functional group is
(a) $-\text{NH}_2$ (b) $-\text{OH}$ (c) $-\text{COOH}$ (d) $-\text{CHO}$
- xvii) Electrolyte in lead storage cell is
(a) HCl (b) HNO_3 (c) H_2SO_4 (d) NaOH
- xviii) Which is not buffer solution
(a) $\text{NH}_4\text{OH} + \text{NH}_4\text{NO}_3$, (b) $\text{NaOCOCH}_3, \text{CH}_3\text{COOH}$
(c) $\text{NaH}_2\text{PO}_2, \text{H}_3\text{PO}_3$ (d) $\text{NH}_4\text{Cl} + \text{NaCl}$
- xix) While passing 0.03 F of electricity produces element at electrode
(a) 0.01 Eq (b) 0.02 Eq (c) 0.03 Eq (d) 0.06 Eq
- xx) The correct electronic configuration of Fe^{+3} is
(a) $3d^5 4s^1$ (b) $3d^5$ (c) $4s^1 3d^4$ (d) $3d^4 4s^2$
- xxi) Ozonolysis of alkenes requires the reagents
(a) $\text{O}_3, \text{Zn}, \text{H}_2\text{O}$ (b) O_3, Al (c) $\text{O}_3, \text{Ni}, \text{H}_2\text{O}$ (d) $\text{O}_3, \text{H}_2\text{O}$
- xxii) The metal gives of H_2 gas (on reaction with dilute H_2SO_4) is
(a) Fe (b) Ag (c) Cu (d) Au
- xxiii) Aluminium chloride exists as
(a) monomer (b) dimer (c) trimer (d) tetramer
- xxiv) Element used as semiconductor is
(a) Cu (b) Al (c) K (d) Si

Group-A

2. a) Calculate the number of atoms in 0.011 gm CO_2 .
b) Ethyl alcohol has higher boiling point than dimethyl ether- Why?
c) How much gm of NH_3 is formed by reaction of 0.0535 gm NH_4Cl with NaOH ?
d) What happens during passing dry HCl gas through saturated solution of NaCl - explain.
3. a) Mention two defects of Bohr's theory on electrons.
b) Show the bonding in - (i) HNO_2 (ii) MgCl_2
c) What are meant by inter and intra molecular hydrogen bonding? Give example.
d) Define: Lewis theory acidity.
4. a) Explain why does ice float in water?

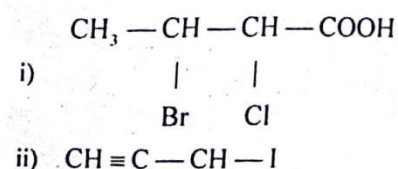
- b) Define pH of a solution.
- c) Calculate the pH of 0.0001 (N) HCl solution.
- d) State Pauli Exclusion Principle and Hund's Rule.

Group-B

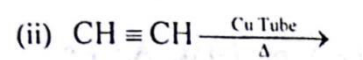
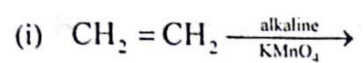
- 5. a) 20 ml 0.4 (N) H₂SO₄ is mixed with 80ml 0.5 (N) NaOH solution. What is the nature and strength of final solution?
 - b) Balance by ion electron method:
 - i) $\text{MnO}_4^- + \text{H}^+ + \text{S}^{2-} \rightarrow \text{Mn}^{2+} + \text{S} + \text{H}_2\text{O}$
 - ii) $\text{Cl}_2 + \text{OH}^- \rightarrow \text{Cl}^- + \text{OCl}^- + \text{H}_2\text{O}$
 - c) Calculate the oxidation number of- (i) Cr in K₂Cr₂O₇, (ii) Two 'N' in NH₄NO₃.
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- 6. a) Write the electrodes, electrolyte and reactions in DRY CELL.
 - b) Electricity of 4 ampere is passed for 483 seconds through a solution to deposit 0.5 gm of a metal of equivalent weight 25. Find out the value of Faraday.
 - c) Derive the relation between chemical and electrochemical equivalent weight of an element.
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- 7. a) State La Chatelliar's principle.
 - b) Write the physic-chemical principles to prepare –
 - (1) NH₃ by Haber's process. (ii) HNO₃ by Ostwald's process.
 - c) What are the electrodes, electrolyte used for Nickel plating on iron metal?

Group-C

- 8. a) Explain permanent and temporary hardness with examples.
 - b) Write the principles and reactions of permutit process for removal of hardness of water.
 - c) How Na₂ EDTA is applied to estimate hardness of water? Briefly mention it.
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- 9. a) Write the reactions and principles to extract copper metal.
 - b) Mention the principles to manufacture steel, including reactions.
 - c) Explain whether the reaction, $\text{Al} + \text{CuSO}_4 = \text{Cu} + \text{Al}_2(\text{SO}_4)_3$
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- 10. (a) Write the IUPAC name:



(b) Write the products:



(c) How ethylene and acetylene separated from their mixture?

(d) What is methylated spirit?