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WBSCTE DIPLOMA QUESTION PAPER

FIRST YEAR COMMON FOR ALL BRANCHES

BASIC CHEMISTRY DEC 2016

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

i) Basic functional group is

(a) $-COOCH_3$ (b) -CHO (c) -NH, (d) -COOH

ii) Unit of electrochemical equivalent weight is

(a) ampere/gm (b) coulomb/gm (c) gm/coulomb (d) coulomb/kg

iii) De Broglie relation for wave nature of electron is

(a) $\lambda = h/mv$ (b) $\lambda h = my$ (c) $\lambda hmv = 1$ (d) $\lambda = hmv$

iv) Which compound is not aromatic?

(a) benzene (b) phenol (c) naphthalene (d) hexane-1 -ol

v) Spiegel doesn't contain

(a) Mn (b) C (c) Fe (d) Zn

vi) Oxidation number of oxygen in OF_2 is

(a) -2 (b) +2 (c) 0 (d) +1

vii) Which one is a buffer solution?

(a) $CH_3COOH+HCl$ (b) NH_4NO_3+NaC1

(c) NaCl+HCl (d) NH_4OH+NH_4Cl

viii) Equivalent weight of $H_4\ PO_4$ is (Molecular weight is M)

(a) M/4 (b) 3M (c) M/3 (d) 2M/3

ix) The secondary standard solution is

(a) Na_2CO_3 (anhydrous) (b) $K_2Cr_2O_7$ (c) NaOH (d) $H_2C_2O_4\ 2H_2O$

x) Which quantum number repi.esents ORBITAL?

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

xi) Which doesn't produce H_2 gas on reaction with dil H_2SO_4 ?

(a) Mg (b) Cu (c) Zn (d) Sn

xii) Detection of carbon-carbon unsaturation is performed with

(a) $AgNO_3$ (b) ENO_3 (c) $Br_2 + CCl_4$ (d) O_3

xiii) Gas used for welding purpose is

(a) C_2H_2 (b) ethylene (c) methane (d) butane

xiv) Formula of calgon is

(a) $Na_6(PO_3)_6$ (b) Na_3PO_4 (c) H_3PO_3 (d) Na_2HPO_3

xv) Shape of ammonia molecule is

(a) tetrahedral (b) linear (c) triangular planner (d) octahedral

xvi) Very low density of ice is due to

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(a) hydrogen bonding and tetrahedral (b) co-ordinate bonding and tetrahedral

(c) ionic bonding (d) vander walls force

xvii) pH of 0.01N NaOH solution is

(a) 9 (b) 10 (c) 2 (d) 12

xviii) Which shows both as oxidant and reductant?

(a) HNO_3 (b) HNO_2 (c) $KMnO_4$ (d) H_2S

xix) Variable valency is shown by

(a) sulphur (b) nitrogen (c) fluorine (d) oxygen

xx) The element showing the activity as semiconductor is

(a) Zn (b) Ni (c) Si (d) Cu

xxi) Self reduction process if applicable to extract

(a) Na (b) Fe (c) Cu (d) Al

xxii) Acidic compound is

(a) phenol (b) ethanol (c) naphthalene (d) benzene

xxiii) Which is the acid salt?

(a) Na_3PO_4 (b) K_2SO_4 (c) $NaHSO_4$ (d) Pb(OH)Cl

xxiv) Which belongs to homologous series of methane?

(a) C_2H_2 (b) C_2H_4 (c) CH_2OH (d) C_4H_{10}

Group-A

2. a) Show the chemical bonding in NaF, H_3O^+, NH_4^+.

b) Explain why KHF_2 exists but $KHCl_2$ doesn't.

c) Write the postulates of Bohr atomic model regarding electron.

d) State - (i) Pauli exclusion principle, (ii) Hund's rule.

3. a) Why is diamond extremely hard, has very high melting point and non-conductor of electricity but graphite is a good electrical conductor and lubricant?

b) Draw the unit cell diagram of sodium chloride and hence calculate the effective number Nal- and Cl^- ions.

c) Solubility product of $BaSO_4$ is ‘q’? What is the value of solubility?

d) Define buffer solution.

4. a) Calculate the number of atoms in 0.053g Na_2CO_3

b) How much volume of H_2 gas at NTP is produced on reaction between 0.653gm Zn and dilute HCI?

c) by is ethyl alcohol soluble in water but ether doesn't?

d) Explain 'common ion effect' with example.

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Group-B

5. a) Define Faraday.

b) Write the electrodes, electrolyte and reactions in lead storage cell.

c) What are the products on electrolysis of $CuSO_4$ solution using - (i) Pt, (ii) Cu electrodes? Explain.

6. a) Write the physio-chemical principles to prepare sulphuric acid by contact process.

b) Define chemical equilibrium.

c) State La Chatellier's principle.

d) Write two points on Arrhenius theory of electrolytic dissociation.

7. a) Balance by oxidation number or ion electron method:

i) $Cu + HNO_3 \rightarrow Cu(NO_3)2 + N_2O + H_2O$

ii) $Zn + NaOH + NaNO_2 \rightarrow NH, + Na_2ZnO_2$

b) Write the name of one red-ox indicator.

c) How can you prepare 200m1; 0.08(N) MCI from 12(N) HCl solution'?

Group-C

8. a) Mention the reactions occurring in blast furnace for extraction of iron.

b) Write the composition of carbon in three types of iron..

c) Write the electrode, electrolyte and reactions only to extract Al metal.

d) Why aluminium extraction is not possible by carbon reduction method?

9. a) Which type of water should be used for boiler purpose and why?

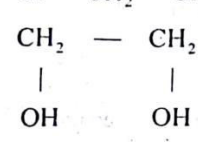
b) Write the softening of hard water by ion exchange resin method (principles and reactions only).

c) One litre of a sample of hard water contains 0.0555g $CaCl_2$, and 0.0240g $MgSO_4$. Calculate the hardness in ppm unit.

d) Which is more pure and why - distilled water or ion-exchange resin treated water?

10. a) Write the IUPAC name:

i) $Cl-CH_2-CH=CH_2$

ii)


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b) Write the products:

i) $CH \equiv CH \xrightarrow[H_2SO_4]{Hg^{+2}}$

ii) $CH_2 = CH_2 \xrightarrow[KMnO_4]{alkaline}$

c) How is rectified spirit prepared?

d) What is power alcohol?