his Question Paper contains 20 printed pages.

I.No. 1100300

052 (E)

Oct/Nov - 2015

(SEMESTER - III)

પ્રશ્ન પેપરનો સેટ નંબર
Set No. of Question Paper:
11

Time : 2½ Hours] [Maximum Marks : 100

Instructions :

1) There are 64 questions in this question paper. All questions are compulsory.
2) Figures to the right indicate full marks to the questions.
3) Select proper option to make the statement correct.
4) The OMR sheet is given for answering the questions. The answer of each question is represented by (A) O, (B) O, (C) O, (D) O. Darken the circle ● of the correct answer with ball-pen.
5) Rough work is to be done on the space provided for this purpose in theTest Booklet only.
6) Read the questions carefully before your answer.
7) Set No. of Question Paper printed on the upper-most right side of the Question Paper is to be written in the Column provided in the OMR sheet.

1) What is 'X' in the following reaction. [1]

$$CH_3-CH_2-Cl+KOH \xrightarrow{CH_3CH_2OH} X+KCl+H_2O$$

(A) Butane (B) Ethane
(C) Ethene (D) Diethyl ether

2) Which of the following alcohol has highest solubility in water? [1]

(A) Glycerol (B) Benzyl alcohol
(C) Ethylene glycol (D) Butyl alcohol

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3) Which of the following alcohols gives ketone on Oxidation? [1]

(A) Ethanol

(B) Butan - 1 - ol

(C) Propan - 2 - ol

(D) Propan - 1 - ol

4) Which of the following product is obtained when phenol react with Br_2 in presence of CS_2 at 273-278 K temperature? [1]

(A) P-Bromo phenol

(B) O-Bromo phenol

(C) 2, 4, 6 - tri bromophenol

(D) O, P - dibromophenol

5) How many number of Carbon atoms in 1-Phenyl Ethanol? [1]

(A) 6 (B) 7

(C) 8 (D) 9

6) Which of the following statement is correct for "Interstitial defect"? [2]

(A) This defects increase the density of substance

(B) This defects increase the number of atom for unit volume

(C) Some of the sites of the lattice are vacant

(D) Particles like atom or molecule get arranged in the interstitial site of the crystal

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7) A solid has a structure in which 'W' atoms are located at the corners of cubic lattice 'O' atom at the center of edges and Na atom at the center of cube. The formula of the compound is – [2]

(A) $NaWO_3$

(B) Na_2WO_2

(C) $NaWO_2$

(D) Na_2WO_3

8) Assertion (A) : The boiling point of 0.1 m glucose solution is less than that of 0.1 m KCl solution.

Reason (R) : Elevation of boiling point is inversely proportional to the number of species present in the solution. [2]

(A) Both (A) and (R) are correct, but (R) is not the correct explanation for (A)

(B) (A) is correct, but (R) is incorrect

(C) (A) is incorrect, but (R) is correct

(D) Both (A) and (R) are correct and (R) is the correct explanation for (A)

9) Which of the following choices is correct regarding colligative property? [2]

(A) ΔT_b : 1m glucose$_{(aq)}$ < 1m $NaCl_{(aq)}$ < 0.2m $BaCl_{2\,(aq)}$

(B) ΔT_b : 0.2m $BaCl_{2\,(aq)}$ < 0.3m $NaCl_{(aq)}$ < 0.3m $AlCl_{3\,(aq)}$

(C) $\Delta\pi$: 1% sucrose$_{(aq)}$ < 1% glucose$_{(aq)}$ < 1% urea$_{(aq)}$

(D) ΔP : 0.5 m $NaCl_{(aq)}$ < 0.05m sucrose$_{(aq)}$ < 0.5m $Na_2SO_{4(aq)}$

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10) Calculate the solubility in water in term of mole fraction in partial pressure of CO_2 is 2×10^{-8} bar at 298 K temperature, the K_H value for CO_2 is 6.02×10^{-4} bar. [2]

(A) 3.322×10^{-5} (B) 3.011×10^{-5}

(C) 3.322×10^{-4} (D) 3.011×10^{-6}

11) Which of the following alcohols yields corresponding alky chloride on reaction with con. HCl + anhyd. $ZnCl_2$ at room temperature? [2]

(A) propane - 1- ol (B) iso butyl alcohol

(C) 2-methyl propan -1-ol (D) 2-methyl butane -2-ol

12) Which of the following is correct order of boiling point of alcohol? [2]

i) Propan 1-ol

ii) Butan -1-ol

iii) Butan 2-ol

iv) 2-Methyl propan - 2-ol

(A) (i) < (iii) < (ii) < (iv)

(B) (i) < (ii) < (iv) < (iii)

(C) (i) < (iv) < (iii) < (ii)

(D) (i) < (ii) < (iii) < (iv)

13) Which is the correct priority order for absolute configuration? [2]

(A) $-COOH, -CONH_2, -CHO, -COCH_3$

(B) $-COCH_3, -CONH_2, -COOH, -CHO$

(C) $-COOH, -COCH_3, -CONH_2, -CHO$

(D) $-COOH, -CONH_2, -COCH_3, -CHO$

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14) What is called the reaction used to get Alkylfluoride in presence of metallic fluorides? [2]

(A) Grignard reaction (B) Finkelstein reaction

(C) Swartz reaction (D) Wurtz reaction

15) $HNO_3 + X \rightarrow HPO_3 + Y$ In this equation mention the formula of X and Y. [2]

(A) $X = P_4O_{10}, Y = N_2O_5$

(B) $X = P_2O_5, Y = N_2O_5$

(C) $X = P_4O_{10}, Y = N_2O_4$

(D) $X = P_2O_5, Y = N_2O_4$

16) Which of the following pairs is proper for the method used in Column - I and metal obtained in Column - II? [2]

	Column - I		Column - II
P	Distillation	X	Cu
Q	Smelting	Y	Hg
R	Electrolysis	Z	Sn

(A) $P \rightarrow X, Q \rightarrow Y, R \rightarrow Z$

(B) $P \rightarrow Y, Q \rightarrow Z, R \rightarrow X$

(C) $P \rightarrow Y, Q \rightarrow X, R \rightarrow Z$

(D) $P \rightarrow Z, Q \rightarrow X, R \rightarrow Y$

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17) Select the suitable choice by comparing Column I with II. [2]

	Column - I		Column - II
X	Cryolite	M	$Na[Al(OH)_4]$
Y	Sodium-Aluminate	N	$[Al_2(OH)_4.Si_2O_5]$
Z	Kaolinite	P	$Na[Al_2(OH)_4]$
		Q	$Na[Al_2(OH)_4.Si_2O_5]$
		R	$Na_3[AlF_6]$

(A) X→R, Y→P, Z→Q

(B) X→R, Y→Q, Z→N

(C) X→R, Y→M, Z→N

(D) X→R, Y→P, Z→N

18) How many electrons will be passing through the cross section of an electric conductor in 1 second if 0.965 ampere current is passing per second? [2]

(A) 6.022×10^{23} (B) 6.022×10^{18}

(C) 6.022×10^{22} (D) 6.022×10^{-22}

19) 1 mole electron are passed through $CuSO_4$, $AgNO_3$ and $AlCl_3$, what will be the mole ratio of Cu, Ag and Al collected at the electrodes? [2]

(A) 3 : 6 : 2 (B) 1 : 2 : 3

(C) 2 : 1 : 3 (D) 1 : 1 : 1

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20) The quantity of electrolysis required for reduction of 1 mole MnO_4^- to MnO_2 [2]

(A) 1F

(B) 3F

(C) 7F

(D) 6F

21) In Column - I different magnetism are given and in Column - II alignment of magnetic dipoles are given, Match Column - I with Column - II. [3]

	Column - I		Column-II
(P)	Diamagnetic	(i)	↑↑↑↑↑↑
(Q)	Ferromagnetic	(ii)	↑↓↑↓↑↓
(R)	Antiferromagnetic	(iii)	↑↓↓↑↓↑
(S)	Ferrimagnetic	(iv)	↑↓↑↓↑↑
		(v)	↑↓↑↓↓↓

(A) (P)→(iv), (Q)→(iii), (R)→(v), (S)→(i)

(B) (P)→(iv), (Q)→(i), (R)→(iii), (S)→(ii)

(C) (P)→(v), (Q)→(i), (R)→(ii), (S)→(iii)

(D) (P)→(v), (Q)→(ii), (R)→(i), (S)→(iii)

Space for Rough Work

22) 12 gram of urea is dissolved in 2 liter solution at 300 K temperature. How many gram of NaCl should be dissolved in 10 liter solution so that it becomes iso-Osmotic with urea solution? [3]

[At. wt of Na = 23, Cl = 35.5 gm/mole]

(A) 29.25 gram (B) 7.31 gram

(C) 5.85 gram (D) 19.5 gram

23) Calculate the equilibrium constant of the reaction. [3]

$$Cu_{(s)} + 2Ag^{+}_{(aq)}(1M) \rightleftharpoons Cu^{2+}_{(aq)}(1M) + Ag_{(s)}$$

$$\left[E^{\circ}_{Cu/Cu^{+2}} = -0.34 \text{ volt} \;\&\; E^{\circ}_{Ag/Ag^{+}} = -0.80 \text{ volt}\right]$$

(A) 3.92×10^{-15} (B) 3.92×10^{15}

(C) 3.92×10^{13} (D) 3.92×10^{-13}

24) Mention the proper choice for the True and False Statement. For True Statement T and for False Statement F are mentioned. [3]

(a) Oxygen element possesses –2, –1, +1, +2, oxidation state

(b) The value of electron gain enthalpy of Cl element is more negative than that of F element

(c) Ozone is colourless in solid form

(d) Chlorine water when kept for longer times loses yellow colour

(A) TFTF

(B) TTFT

(C) TFTT

(D) FTFT

Space for Rough Work

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25) How many gram of Cu will be obtained by passing 6.0 ampere current through 1 liter 0.78 M $CuCl_2$ aqueous solution by dipping inert electrodes? What will be the change in concentration? [3]

[At. wt. of Cu = 63.5 gm/mole]

(A) 14.21 gms Cu, Decrease in concentration is 0.2238M

(B) 28.43 gms Cu, Decrease in concentration is 0.2238M

(C) 28.43 gms Cu, Decrease in concentration is 0.4477M

(D) 0.4477 gm Cu, Decrease in concentration is 0.2238M

26) Arrange the following halides in increasing order of SN^2 reactivity: [3]

CH_3Br, CH_3CH_2Cl, CH_3Cl, $(CH_3)_2CHCl$

(A) $(CH_3)_2CHCl < CH_3CH_2Cl < CH_3Cl < CH_3Br$

(B) $CH_3CH_2Cl > CH_3Cl > CH_3Br > (CH_3)_2CHCl$

(C) $CH_3CH_2Cl < CH_3Cl < CH_3Br < (CH_3)_2CHCl$

(D) $(CH_3)_2CHCl > CH_3CH_2Cl > CH_3Cl > CH_3Br$

Space for Rough Work

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27) Calculate degree of dissociation (α) for $K_3[Fe(CN)_6]$ when depression in freezing point is 0.062 K for 0.01 m $K_3[Fe(CN)_6]$ aqueous solution. The molal depression constant (K_f) for solvent is 1.86 K kg mole^{-1}. [4]

(A) 0.778

(B) 1.287

(C) 0.287

(D) 1.778

28) In Section - I conversion are given and in Section - II name of reaction are given Match Section - I and Section - II. [4]

	Section - I		Section - II
(1)	Ethyl acetate from ethanol	(a)	Wurtz-Fittig reaction
(2)	Ethoxy ethane from ethanol	(b)	Esterification
(3)	Salicyl adehyde from Phenol	(c)	Reimer - Tiemann Reaction
(4)	Ethyl benzene from Chlorobenzene	(d)	Etherification reaction
		(e)	Alkylation reaction

(A) (1)→ (e), (2)→ (b), (3)→ (a), (4)→ (d)

(B) (1)→ (b), (2)→ (d), (3)→ (c), (4)→ (a)

(C) (1)→ (c), (2)→ (e), (3)→ (d), (4) → (b)

(D) (1)→ (d), (2)→ (a), (3)→ (e), (4)→ (c)

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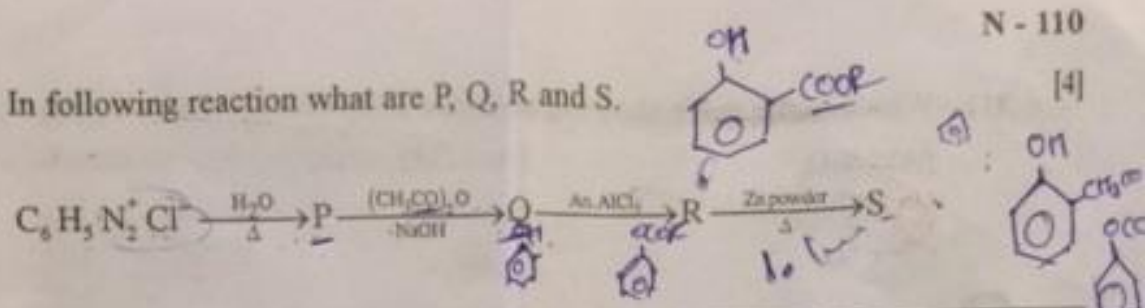
29) In following reaction what are P, Q, R and S. [4]



Options	P	Q	R	S
(A)	Aniline	Acetanilide	P-amino acetophenone	Benzene
(B)	Phenol	Phenyl acetate	2-Hydroxy acetophenone	Acetophenone
(C)	Phenol	Acetophenone	2-Hydroxy acetophenone	Benzene
(D)	Phenol	P-methyl acetophenone	2-Hydroxy acetophenone	Acetophenone

30) Which is the correct formula for radius of atom in hexagonal packing (hcp) Unit cell? [1]

(A) $r=\frac{4}{\sqrt{3}}.a$ (B) $r=\frac{\sqrt{3}}{4}.a$

(C) $r=\frac{1}{2\sqrt{2}}.a$ (D) $r=2\sqrt{2}.a$

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31) Which of the oxide shows appearance like Metallic Copper? [1]

(A) TiO_2 (B) CrO_2

(C) ReO_3 (D) VO_2

32) F - centers in an ionic crystal are: [1]

(A) Lattice site containing electron

(B) Lattice site that are vacant

(C) Sinterstial site containing cations

(D) Interstitial site containing electrons

33) In a face-centred cubic lattice the number of nearest neighbours for given lattice point is – [1]

(A) 6 (B) 8

(C) 12 (D) 14

34) What is the coordination number of CS^+ in CSCl unit cell? [1]

(A) 1 (B) -1

(C) 8 (D) 4

35) Whose elevation in boiling point will be the same as for 0.1m KNO_3? [1]

(A) 0.1 m Urea

(B) 0.1 m Potassium sulphate

(C) 0.1 m Sodium chloride

(D) 0.1 m Aluminium nitrate

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36) If 'n' is the number of ions given by 1 mole of electrolyte, the degree of dissociation 'α' of electrolyte is – [1]

(A) $\frac{i-1}{n+1}$ (B) $\frac{i-1}{n-1}$

(C) $\frac{n-1}{i-1}$ (D) $\frac{n+1}{i-1}$

37) What is the main function of salt bridge in Daniell cell? [1]

(A) To conduct e^-
(B) To conduct Zn^{2+} ion
(C) To conduct Cu^{2+} ion
(D) To maintain electrical neutrality of solution

38) On the basis of which principle Nernst equation is deduced? [1]

(A) Bohr's principle (B) Law of thermodynamics
(C) Faraday's law (D) Kohlrauch's law

39) When reaction occurs in concentration cell -------- [1]

(A) ions remain neutral
(B) concentration of ions remain constant
(C) ion from dilute solution move towards concentrated solution
(D) ion of concentrated solution move towards dilute solution

40) Electrolysis is what type of reaction? [1]

(A) Reduction (B) Redox
(C) Neutralization (D) Oxidation

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41) By electrolysis of which compound Cl_2 is obtained at anode and Na metal at Cathode? [1]

(A) Concentrated solution of NaCl
(B) Molten NaCl
(C) Dilute NaCl
(D) Dilute aqueous NaCl

42) Gem stone is the impure form of which compound? [1]

(A) Al_2O_3 (B) Cu_2O
(C) Cr_2O_3 (D) Mn_2O_3

43) By which substance Silver is Leached? [1]

(A) KCN (B) NaCN
(C) $Zn(CN)_2$ (D) $[Zn(CN)_4]^{2-}$

44) Which substance is used as adsorbent in chromatographic method? [1]

(A) Al_2O_3 (B) SiO_2
(C) MgO (D) CaO

45) Which metal is mainly present in impure form in Cu obtained by Bessemerisation process? [1]

(A) Al (B) Fe
(C) Co (D) Ni

46) Which metal is used in preparation of tubes of boiler? [1]

(A) Mg (B) Cu
(C) Pt (D) Ni

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47) Which is the ore of iron? [1]

(A) Bauxite
(B) Haematite
(C) Malachite
(D) Calamine

48) Which of the following elements is not included in Group-15? [1]

(A) As (B) N
(C) Se (D) Bi

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49) Which of following oxide is not acidic? [1]

(A) N_2O_3 (B) P_4O_{10}
(C) N_2O_5 (D) Bi_2O_5

50) $(NH_4)_2Cr_2O_7 \xrightarrow{\Delta} N_{2(g)} + 4H_2O_{(l)} + X_{(s)}$ Mention the substance 'X' in this reaction. [1]

(A) Cr_2O_3
(B) K_2CrO_4
(C) NH_3
(D) CrO_3

51) What coloured complex ion is formed by ammonia with Cu^{2+} ion? [1]

(A) Blue
(B) Green
(C) Violet
(D) Dark blue

Space for Rough Work

52) Which of the following statements is not applicable to white Phosphorous? [1]

(A) It is highly reactive
(B) It is soluble in non-polar solvent
(C) It is non-poisonous
(D) It is stored in water

53) Which acid is obtained by dissolving P_4O_6 in water? [1]

(A) H_3PO_2
(B) H_3PO_3
(C) H_3PO_4
(D) $H_4P_2O_7$

54) What is called aquaregia solution? [1]

(A) Mixture of 50% HCl + 50% con.HNO_3
(B) 1 part con.HCl + 3 part con.HNO_3
(C) 3 part con.HCl + 1 part dil. HNO_3
(D) 3 part con.HCl + 1 part con.HNO_3

55) Which interhalogen compound is identified by spectroscopic method? [1]

(A) ICl
(B) IF
(C) ClF
(D) BrCl

56) What is the colour of ICl_3? [1]

(A) Colour less
(B) Shining red
(C) Yellowish green liquid
(D) Orange

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57) Which is the molecule that possesses pentagonal bipyramid structure? [1]

(A) ClF_5

(B) BrF_5

(C) IF_5

(D) IF_7

58) Which of the following compound is a Vicinal dihalide? [1]

(A) 1, 2 - Dichloro ethane

(B) 1, 1 - Dichloro ethane

(C) Ethylidene chloride

(D) Dichloro methane

59) Which is not a polyhalogen? [1]

(A) Methyl chloride

(B) Dichloro methane

(C) Chloroform

(D) Carbon tetrachloride

60) Which compound has lowest polarity? [1]

(A) CH_3F

(B) CH_3Cl

(C) CH_3Br

(D) CH_3I

Space for Rough Work

61) Which of the following is used in fire-extinguisher? [1]

(A) Pyrene
(B) Phosgene
(C) Phosphine
(D) Ammonia

62) What is the product of Wurtz reaction of methyl iodide? [1]

(A) Methane
(B) Ethane
(C) Propane
(D) Butane

63) Give name of the following reaction: [1]

$$CH_3CH_2Cl + NaI \xrightarrow{CH_3COCH_3} CH_3CH_2I + NaCl$$

(A) Swartz reaction
(B) Finkelstein reaction
(C) Grignard reaction
(D) Wurtz reaction

64) Which poisonous compound is formed if Chloroform kept in open air? [1]

(A) Phosphine
(B) Phosgene
(C) Freone
(D) Carbon tetrachloride

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NIB SCHOOL OF SCIENCE, PALANPUR

Feel free to contact us:

info@nibschool.com

M: 9638036545