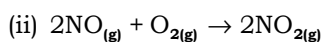
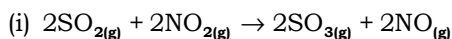


MH CET 2018

(QUESTION WITH ANSWER)

CHEMISTRY

51. A certain reaction occurs in two steps as



In the reaction,

- (1) $NO_{2(g)}$ is intermediate
- (2) $NO_{(g)}$ is intermediate
- (3) $NO_{(g)}$ is catalyst
- (4) $O_{2(g)}$ is intermediate

Ans. (2)

Sol. Factual

52. Which among the following equations represents the first law of thermodynamics under isobaric conditions ?

$$(1) \Delta U = q_q - P_{ex} \cdot \Delta V$$

$$(2) q_v = \Delta U$$

$$(3) \Delta U = W$$

$$(4) W = -q$$

Ans. (1)

Sol. $\Delta U = q + W$

$$= q + (-P_{ex} \cdot \Delta V) (\because W = -P_{ex} \cdot \Delta V)$$

$$\Delta U = q_q - P_{ex} \cdot \Delta V$$

53. During galvanization of iron, which metal is used for coating iron surface ?

- (1) Copper
- (2) Zinc
- (3) Nickel
- (4) Tin

Ans. (2)

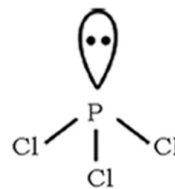
Sol. Because zinc gets oxidized first when it comes in contact with moisture and hence the iron surface is protected from corrosion.

54. Formation of PCl_3 is explained on the basis of what hybridisation of phosphorus atom ?

- (1) sp^2
- (2) sp^3
- (3) sp^3d
- (4) sp^3d^2

Ans. (2)

Sol. PCl_3 - has 3 sigma bonds and 1 lone pair
 $3 + 1 = 4$

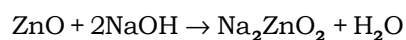


Hence hybridization = sp^3

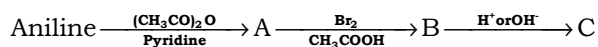
55. Identify the element that forms amphoteric oxide.

- (1) carbon
- (2) Zinc
- (3) Calcium
- (4) Sulphur

Ans. (2)



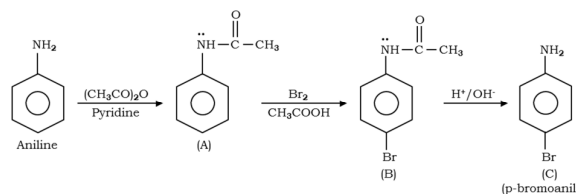
56. Identify the product 'C' in the following Reaction.



- (1) Acetanilide
- (2) p-Bromoacetanilide
- (3) p-Bromoaniline
- (4) o-Bromoaniline

Ans. (3)

Sol.



57. Identify the functional group that has electron donating inductive effect.

- (1) -COOH
- (2) -CN
- (3) -CH₃
- (4) -NO₂

Ans. (3)

Sol. -CH₃ is electron donating group which shows +I effect.

58. Which among the following metal crystallise as a simple cube ?

- (1) Polonium
- (2) Iron
- (3) Copper
- (4) Gold

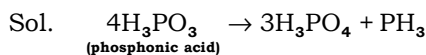
Ans. (1)

Sol. Polonium

59. Which among the following oxoacids of phosphorous shows a tendency of disproportionation ?

- (1) Phosphinic acid (H₃PO₂)
- (2) Orthophosphoric acid (H₃PO₄)
- (3) Phosphonic acid (H₃PO₃)
- (4) Pyrophosphoric acid (H₄P₂O₇)

Ans. (3)



60. What is the oxidation number of gold in the complex $[\text{AuCl}_4]^{1-}$?

- (1) +4
- (2) +3
- (3) +2
- (4) +1

Ans. (2)

Sol. $\text{Au} = x$

$$x + 4(-1) = -1$$

$$x - 4 = -1$$

$$x = -1 + 4$$

$$x = +3$$

61. Which symbol replaces the unit of atomic mass, amu?

- (1) *u*
- (2) *A*
- (3) *M*
- (4) *n*

Ans. (1)

Sol. 'u'

62. Which of the following compounds reacts immediately with Lucas reagent ?

- (1) CH₃CH₂OH
- (2) CH₃CH₂CH₂OH
- (3) $\text{CH}_3 - \underset{\text{OH}}{\underset{|}{\text{C}}} - \text{CH}_3$

- (4) $\text{CH}_3 - \underset{\text{OH}}{\underset{|}{\text{C}}}(\text{CH}_3) - \text{CH}_3$

Ans. (4)

Sol. 3^o alcohol reacts with lucas reagent (HCl + anhydrous ZnCl₂) immediately and gives two separate layers.

63. What is the catalyst used for oxidation of SO₂ to SO₃ in lead chamber process for manufacture of sulphuric acid ?

- (1) Nitric oxide
- (2) Nitrous oxide

(3) Potassium iodide

(4) Dilute HCl

Ans. (1)

Sol. Nitric oxide

64. The number of moles of electrons passed when current of 2 A is passed through an solution of electrolyte for 20 minutes is

(1) $4.1 \times 10^{-4} \text{ mol e}^-$

(2) $1.24 \times 10^{-2} \text{ mol e}^-$

(3) $2.487 \times 10^{-2} \text{ mol e}^-$

(4) $2.487 \times 10^{-1} \text{ mol e}^-$

Ans. (3)

Sol. $\frac{2 \times 20 \times 60}{96500} = 0.02487$

65. The molarity of urea (molar mass 60 g mol⁻¹) solution by dissolving 15 g of urea in 500 cm³ of water is

(1) 2 mol dm⁻³

(2) 0.5 mol dm⁻³

(3) 0.125 mol dm⁻³

(4) 0.0005 mol dm⁻³

Ans. (2)

Sol. Urea molar mass = 60 g/mol

$$\begin{aligned} \text{molarity} &= \frac{15 \times 1000}{60 \times 500} = \frac{15}{6 \times 5} = \frac{1}{2} \\ &= 0.5 \text{ mol dm}^{-3} \end{aligned}$$

66. Which carbon atom of deoxy Ribose sugar in DNA does NOT contain $-\overset{\text{H}}{\underset{\text{H}}{\text{C}}}-\text{OH}$ bond ?

(1) C₅

(2) C₃

(3) C₂

(4) C₁

Ans. (3)

Sol. C₂ → factual

67. Which of the following carboxylic acids is most reactive towards esterification ?

(1) (CH₃)₃CCOOH

(2) (CH₃)₂CHCOOH

(3) CH₃CH₂COOH

(4) (C₂H₅)₂CHCOOH

Ans. (3)

Sol. Bulkier group near the site of reaction, slows down esterification.

68. Molarity is

(1) The number of moles of solute present in 1 dm³ volume of solution

(2) The number of moles of solute dissolved in 1 kg of solvent

(3) The number of moles of solute dissolved in 1 kg of solution

(4) The number of moles of solute dissolved in 100 dm³ volume of solution

Ans. (1)

Sol. molarity: (M) = $\frac{\text{no. of moles of solute}}{\text{vol. of solution of dm}^3}$

69. Which of the followings is a tricarboxylic acid ?

(1) Citric acid

(2) Malonic acid

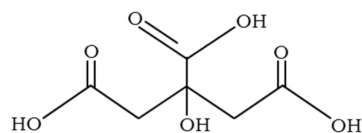
(3) Succinic acid

(4) Malic acid

Ans. (1)

Sol. Citric acid

Structure :



70. What is the number of donor atoms in dimethylglyoximate ligand ?

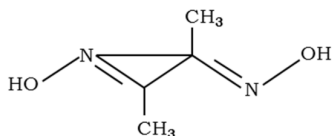
(1) 1

(2) 2

(3) 3

(4) 4

Ans. (2)



Sol.

71. In which substance does nitrogen exhibit the lowest oxidation state ?

- (1) Nitrogen gas
- (2) Ammonia
- (3) Nitrous oxide
- (4) Nitric oxide

Ans. (3)

Sol. Nitrous oxide (N_2O)

72. Which of the following is most reactive towards addition reaction of hydrogen cyanide to form corresponding cyanohydrin ?

- (1) Acetone
- (2) Formaldehyde
- (3) Acetaldehyde
- (4) Diethylketone

Ans. (2)

Sol. Formaldehyde (electrophilicity of carbocation, decreases reactivity decreases)

73. The most basic hydroxide from following is

- (1) $Pr(OH)_3$ ($Z = 59$)
- (2) $Sm(OH)_3$ ($Z = 62$)
- (3) $Ho(OH)_3$ ($Z = 67$)
- (4) $La(OH)_3$ ($Z = 57$)

Ans. (4)

Sol. $La(OH)_3$ ($Z = 57$)

Due to lanthanide contraction.

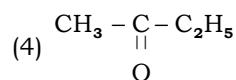
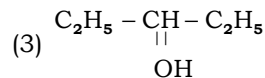
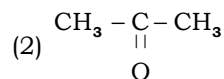
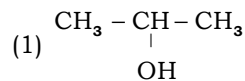
74. What is the SI unit of density?

- (1) $g\ cm^{-3}$
- (2) $g\ m^{-3}$
- (3) $kg\ m^{-3}$
- (4) $kg\ cm^{-3}$

Ans. (3)

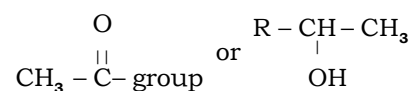
Sol. $kg\ m^{-3}$

75. Which of the following compounds does NOT undergo haloform reaction?



Ans. (3)

Sol. Haloform is given by compound containing



76. Two moles of an ideal gas are allowed to expand from a volume of $10\ dm^3$ to $2\ dm^3$ at $300\ K$ against a pressure of $101.325\ KPa$. Calculate the work done

- (1) $-201.6\ kJ$
- (2) $13.22\ kJ$
- (3) $-810.6\ kJ$
- (4) $-18.96\ kJ$

Ans. (1)

Sol. $v_1 = 10\ dm^3 = 10^{-2}\ m^3$

$$v_2 = 2\ m^3$$

$$p = 101.325 \times 10^3 (1.99)$$

$$W = -101.325 \times 10^3 (1.99)$$

$$= -201.6\ kJ$$

77. In which among the following solids, Schottky defect is NOT observed ?

- (1) ZnS
- (2) NaCl
- (3) KCl
- (4) CsCl

Ans. (1)

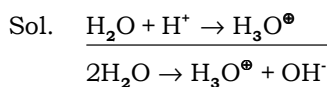
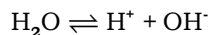
Sol. ZNS – shows Frenkel defects

78. What are the products of auto-photolysis of water ?

- (1) H_2 and O_2

- (2) Steam
 (3) H_3O^+ and OH^-
 (4) Hydrogen peroxide

Ans. (3)



79. Bauxite, the ore of aluminium, is purified by which process ?

- (1) Hoopé's process
 (2) Hall's process
 (3) Mond's process
 (4) Liqation process

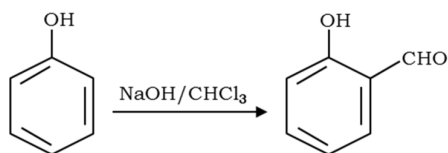
Ans. (2)

Sol. Hall's process

80. Phenol in presence of sodium hydroxide reacts with chloroform to form salicylaldehyde. The reaction is known as

- (1) Kolbe's reaction
 (2) Reimer-Tiermann reaction
 (3) Stephen reaction
 (4) Etard reaction

Ans. (2)



Sol. Reimer-Tiermann

81. Which among the following elements of group-2 exhibits anomalous properties ?

- (1) Be
 (2) Mg
 (3) Ca
 (4) Ba

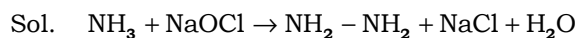
Ans. (1)

Sol. Be-belongs to second period

82. Excess of ammonia with sodium hypochloride solution in the presence of glue or gelatine gives

- (1) NaNH_2
 (2) NH_2NH_2
 (3) N_2
 (4) NH_4Cl

Ans. (2)



83. What is the density of solution of sulphuric acid used as an electrolyte in lead accumulator?

- (1) 1.5 gmL^{-1}
 (2) 1.2 gmL^{-1}
 (3) 1.8 gmL^{-1}
 (4) 2.0 gmL^{-1}

Ans. (2)

Sol. 1.2 gmL^{-1}

84. Which of the following polymers is used to manufacture clothes for firefighters ?

- (1) Thiokol
 (2) Kevlar
 (3) Nomex
 (4) Dynel

Ans. (3)

Sol. Nomex

85. Which element is obtained in the pure form by van Arkel method ?

- (1) Aluminium
 (2) Titanium
 (3) Silicon
 (4) Nickel

Ans. (2)

Sol. Titanium-Van Arkel method

86. Which of the following is NOT a tranquilizer ?

- (1) Meprobamate
- (2) Equanil
- (3) Chlordiazepoxide
- (4) Bromopheniiramine

Ans. (4)

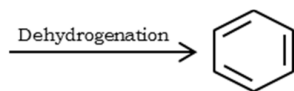
Sol. Bromopheniiramine-Antihistamine

87. Conservation of hexane into benzene involves the reaction of

- (1) Hydration
- (2) Hydrolysis
- (3) Hydrogenation
- (4) Dehydrogenation

Ans. (4)

Sol. $\text{CH}_3\text{—CH}_2\text{—CH}_2\text{—CH}_2\text{—CH}_2\text{—CH}_3$



88. The element that does NOT exhibit allotropy is

- (1) Phosphorus
- (2) Arsenic
- (3) Antimony
- (4) Bismuth

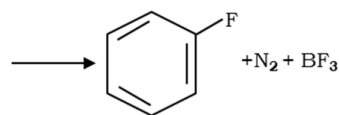
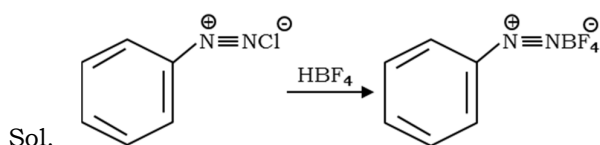
Ans. (4)

Sol. Bismuth

89. Which of the following reactions is used to prepare aryl fluorides from Diazonium salts and fluoroboric acid ?

- (1) Sandmeyer reaction
- (2) Balz-Schiemann reaction
- (3) Gattermann reaction
- (4) Swarts reaction

Ans. (2)



90. The correct relation between elevation of boiling point and molar mass of solute is

$$(1) M_2 = \frac{K_b \cdot W_2}{\Delta T_b \cdot W_1}$$

$$(2) M_2 = \frac{K_b \cdot W_1}{\Delta T_b \cdot W_2}$$

$$(3) M_2 = \frac{\Delta T_b \cdot K_b}{W_1 \cdot W_2}$$

$$(4) M_2 = \frac{\Delta T_b \cdot W_1}{K_b \cdot W_2}$$

Ans. (1)

Sol. $\Delta T_b = \frac{K_b \times W_2 \times 1000}{W_1 \times M_2}$

$$M_2 = \frac{K_b \times W_2}{\Delta T_b \times W_1}$$

91. Which among the group-15 elements does NOT exist as tetra atomic molecule ?

- (1) Nitrogen
- (2) Phosphorus
- (3) Arsenic
- (4) Antimony

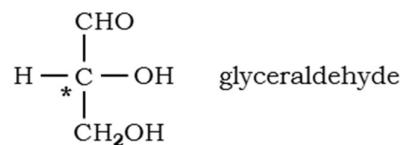
Ans. (1)

Sol. Nitrogen exists as N_2

92. Identify the monosaccharide containing only one asymmetric carbon atom in its molecule.

- (1) Ribulose
- (2) Ribose
- (3) Erythrose
- (4) Glyceraldehyde

Ans. (4)



Sol.

93. Identify the oxidation states of titanium ($Z = 22$) and copper ($Z = 29$) in their colourless compounds.

- (1) Ti^{3+} , Cu^{2+}
- (2) Ti^{2+} , Cu^{2+}
- (3) Ti^{4+} , Cu^{1+}
- (4) Ti^{4+} , Cu^{2+}

Ans. (3)

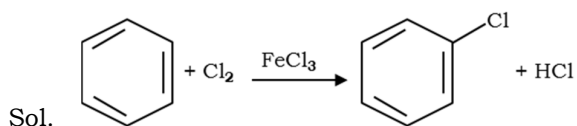
Sol. $Ti : [Ar]4s^23d^2$ $Cu : [Ar]4s^13d^{10}$

$Ti^{+4} : [Ar]4s^03d^0$ $Cu^{+1} : [Ar]4s^03d^{10}$

94. Arenes on treatment with chlorine in presence of ferric chloride as a catalyst undergo what type of reaction ?

- (1) Electrophilic substitution
- (2) Nucleophilic substitution
- (3) Electrophilic addition
- (4) Nucleophilic addition

Ans. (1)



95. In case of R, S configuration the group having highest priority is

- (1) $-NO_2$
- (2) $-NH_2$
- (3) $-CN$
- (4) $-OH$

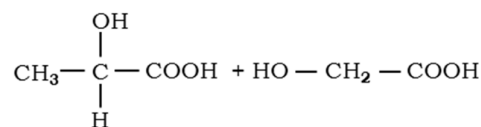
Ans. (4)

Sol. Atomic mass of oxygen is more than that of C & N

96. Lactic acid and glycollic acid are the monomers used for preparation of Polymer

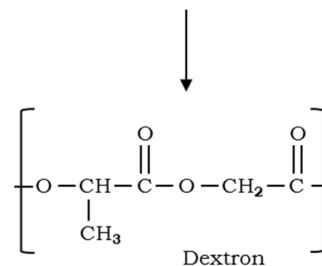
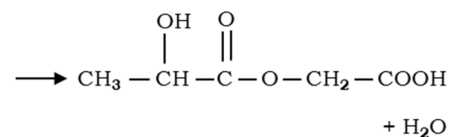
- (1) Nylon-2-nylon-6
- (2) Dextron
- (3) PHBV
- (4) Buna-N

Ans. (2)



Lactic acid

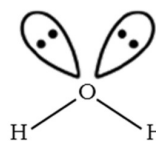
Sol.



97. What is the geometry of water molecule ?

- (1) distorted tetrahedral
- (2) tetrahedral
- (3) Trigonal planer
- (4) diagonal

Ans. (1)



Sol.

98. With which halogen the reactions of alkanes are explosive ?

- (1) Fluorine
- (2) Chlorine
- (3) Bromine
- (4) Iodine

Ans. (1)

Sol. $R - H + F_2 \xrightarrow{\text{dark}} R - F + HF$ (highly exothermic)

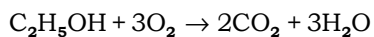
99. Calculate the work done during combustion of 0.138 kg of ethanol, $C_2H_5OH(l)$ at 300 K. Given: $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$, molar mass of ethanol = 46 g mol^{-1}

- (1) -7482 J
- (2) 7482 J

(3) -2494 J

(4) 2494 J

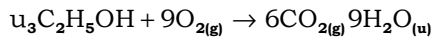
Ans. (2)



Sol. $\downarrow \quad \quad \downarrow \quad \quad \downarrow \quad \quad \downarrow$
 1 $\quad \quad$ 3 $\quad \quad$ 2 $\quad \quad$ 3

$$0.138 \text{ kg} = 138/46 = 3 \text{ mole}$$

138 gm



$$\Delta H = 6 - 9 = -3$$

$$\text{work} = \Delta nRT$$

$$= -(-3) \times 8.314 \times 300$$

$$= 7482 \text{ J}$$

100. Slope of the straight line obtained byplotting $\log_{10}k$ against $\frac{1}{T}$ represents what

term ?

(1) $-E_a$ (2) $-2.303 E_a/R$ (3) $-E_a/2.303 R$ (4) $-E_a/R$

Ans. (3)

Sol. $K = Ae^{-E_a/RT}$

$$= \ln k = \ln A - \frac{E_a}{RT}$$

$$\log k = \log A - \frac{E_a}{2.303 R} \times \frac{1}{T}$$

$$y = mx + C$$

$$y = \log k \quad x = \frac{1}{T} \quad \text{Slop} = \frac{-E_a}{2.303 R}$$

$$m = \frac{-E_a}{2.303 R}$$