

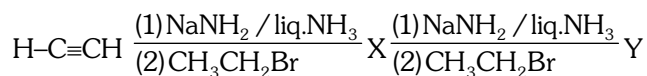
## AIPMT / NEET-2016 TEST PAPER WITH ANSWER & SOLUTIONS (HELD ON SUNDAY 01<sup>st</sup> MAY, 2016)

**46.** Consider the molecules  $\text{CH}_4$ ,  $\text{NH}_3$  and  $\text{H}_2\text{O}$ . Which of the given statements is false ?

- (1) The H–C–H bond angle in  $\text{CH}_4$ , the H–N–H bond angle in  $\text{NH}_3$ , and the H–O–H bond angle in  $\text{H}_2\text{O}$  are all greater than  $90^\circ$
- (2) The H–O–H bond angle in  $\text{H}_2\text{O}$  is larger than the H–C–H bond angle in  $\text{CH}_4$ .
- (3) The H–O–H bond angle in  $\text{H}_2\text{O}$  is smaller than the H–N–H bond angle in  $\text{NH}_3$ .
- (4) The H–C–H bond angle in  $\text{CH}_4$  is larger than the H–N–H bond angle in  $\text{NH}_3$ .

**Ans. (2)**

**47.** In the reaction



X and Y are :

- (1) X = 1-Butyne ; Y = 3-Hexyne
- (2) X = 2-Butyne ; Y = 3-Hexyne
- (3) X = 2-Butyne ; Y = 2-Hexyne
- (4) X = 1-Butyne ; Y = 2-Hexyne

**Ans. (1)**

**48.** Among the following, the correct order of acidity is

- (1)  $\text{HClO}_3 < \text{HClO}_4 < \text{HClO}_2 < \text{HClO}$
- (2)  $\text{HClO} < \text{HClO}_2 < \text{HClO}_3 < \text{HClO}_4$
- (3)  $\text{HClO}_2 < \text{HClO} < \text{HClO}_3 < \text{HClO}_4$
- (4)  $\text{HClO}_4 < \text{HClO}_2 < \text{HClO} < \text{HClO}_3$

**Ans. (2)**

**49.** The rate of a first-order reaction is  $0.04 \text{ mol l}^{-1}\text{s}^{-1}$  at 10 seconds and  $0.03 \text{ mol l}^{-1}\text{s}^{-1}$  at 20 seconds after initiation of the reaction. The half-life period of the reaction is :

- (1) 24.1 s
- (2) 34.1 s
- (3) 44.1 s
- (4) 54.1 s

**Ans. (1)**

**50.** Which one of the following characteristics is associated with adsorption ?

- (1)  $\Delta G$  is negative but  $\Delta H$  and  $\Delta S$  are positive
- (2)  $\Delta G$ ,  $\Delta H$  and  $\Delta S$  all are negative
- (3)  $\Delta G$  and  $\Delta H$  are negative but  $\Delta S$  is positive
- (4)  $\Delta G$  and  $\Delta S$  are negative but  $\Delta H$  is positive

**Ans. (2)**

**51.** In which of the following options the order of arrangement does not agree with the variation of property indicated against it ?

- (1)  $\text{Al}^{3+} < \text{Mg}^{2+} < \text{Na}^+ < \text{F}^-$  (increasing ionic size)
- (2)  $\text{B} < \text{C} < \text{N} < \text{O}$  (increasing first ionisation enthalpy)
- (3)  $\text{I} < \text{Br} < \text{Cl} < \text{F}$  (increasing electron gain enthalpy)
- (4)  $\text{Li} < \text{Na} < \text{K} < \text{Rb}$  (increasing metallic radius)

**Ans. (2 & 3)**

**52.** Which of the following statements is false ?

- (1)  $\text{Mg}^{2+}$  ions form a complex with ATP
- (2)  $\text{Ca}^{2+}$  ions are important in blood clotting
- (3)  $\text{Ca}^{2+}$  ions are not important in maintaining the regular beating of the heart.
- (4)  $\text{Mg}^{2+}$  ions are important in the green parts of plants.

**Ans. (3)**

**53.** Which of the following statements about hydrogen is **incorrect** ?

- (1) hydrogen has three isotopes of which tritium is the most common.
- (2) Hydrogen never acts as cation in ionic salts
- (3) Hydronium ion,  $\text{H}_3\text{O}^+$  exists freely in solution
- (4) Dihydrogen does not act as a reducing agent

**Ans. (1 & 4)**

**54.** The correct statement regarding a carbonyl compound with a hydrogen atom on its  $\alpha$ -carbon, is :-

- (1) a carbonyl compound with a hydrogen atom on its  $\alpha$ -carbon never equilibrates with its corresponding enol.
- (2) a carbonyl compound with a hydrogen atom on its  $\alpha$ -carbon rapidly equilibrates with its corresponding enol and this process is known as aldehyde-ketone equilibration.
- (3) a carbonyl compound with a hydrogen atom on its  $\alpha$ -carbon rapidly equilibrates with its corresponding enol and this process is known as carbonylation.
- (4) a carbonyl compound with a hydrogen atom on its  $\alpha$ -carbon rapidly equilibrates with its corresponding enol and this process is known as keto-enol tautomerism.

**Ans. (4)**

55. MY and  $NY_3$ , two nearly insoluble salts, have the same  $K_{sp}$  values of  $6.2 \times 10^{-13}$  at room temperature. Which statement would be **true** in regard to MY and  $NY_3$  ?

- (1) The molar solubilities of MY and  $NY_3$  in water are identical.
- (2) The molar solubility of MY in water is less than that of  $NY_3$
- (3) The salts MY and  $NY_3$  are more soluble in 0.5 M KY than in pure water.
- (4) The addition of the salt of KY to solution of MY and  $NY_3$  will have no effect on their solubilities.

Ans. (2)

56. In a protein molecule various amino acids are linked together by :

- (1)  $\alpha$ -glycosidic bond
- (2)  $\beta$ -glycosidic bond
- (3) peptide bond
- (4) dative bond

Ans. (3)

57. Natural rubber has

- (1) All cis-configuration
- (2) All trans-configuration
- (3) Alternate cis-and trans-configuration
- (4) Random cis-and trans-configuration

Ans. (1)

58. Match items of **Column I** with the items of **Column II** and assign the correct code :

	Column-I		Column-II
(a)	Cyanide process	(i)	Ultrapure Ge
(b)	Froth floatation process	(ii)	Dressing of ZnS
(c)	Electrolytic reduction	(iii)	Extraction of Al
(d)	Zone refining	(iv)	Extraction of Au
		(v)	Purification of Ni

Code :

- |           |       |       |      |
|-----------|-------|-------|------|
| (a)       | (b)   | (c)   | (d)  |
| (1) (iv)  | (ii)  | (iii) | (i)  |
| (2) (ii)  | (iii) | (i)   | (v)  |
| (3) (i)   | (ii)  | (iii) | (iv) |
| (4) (iii) | (iv)  | (v)   | (i)  |

Ans. (1)

59. Which one of the following statements is correct when  $SO_2$  is passed through acidified  $K_2Cr_2O_7$  solution ?

- (1) The solution turns blue
- (2) The solution is decolourized
- (3)  $SO_2$  is reduced
- (4) Green  $Cr_2(SO_4)_3$  is formed

Ans. (4)

60. The electronic configurations of Eu(Atomic No 63), Gd(Atomic No 64) and Tb (Atomic No. 65) are

- (1)  $[Xe]4f^7 6s^2$ ,  $[Xe]4f^8 6s^2$  and  $[Xe]4f^8 5d^1 6s^2$
- (2)  $[Xe]4f^7 5d^1 6s^2$ ,  $[Xe]4f^7 5d^1 6s^2$  and  $[Xe]4f^9 6s^2$
- (3)  $[Xe]4f^6 5d^1 6s^2$ ,  $[Xe]4f^7 5d^1 6s^2$  and  $[Xe]4f^8 5d^1 6s^2$
- (4)  $[Xe]4f^7 6s^2$ ,  $[Xe]4f^7 5d^1 6s^2$  and  $[Xe]4f^9 6s^2$

Ans. (4)

61. Two electrons occupying the same orbital are distinguished by

- (1) Principal quantum number
- (2) Magnetic quantum number
- (3) Azimuthal quantum number
- (4) Spin quantum number

Ans. (4)

62. Which copper is heated with conc.  $HNO_3$  it produces

- (1)  $Cu(NO_3)_2$  and  $NO_2$
- (2)  $Cu(NO_3)_2$  and  $NO$
- (3)  $Cu(NO_3)_2$ ,  $NO$  and  $NO_2$
- (4)  $Cu(NO_3)_2$  and  $N_2O$

Ans. (1)

63. Which of the following reagents would distinguish cis-cyclopenta-1,2-diol from the trans-isomer?

- (1) Acetone
- (2) Ozone
- (3)  $MnO_2$
- (4) Aluminium isopropoxide

Ans. (1)

64. The correct thermodynamic conditions for the spontaneous reaction at all temperatures is

- (1)  $\Delta H < 0$  and  $\Delta S = 0$
- (2)  $\Delta H > 0$  and  $\Delta S < 0$
- (3)  $\Delta H < 0$  and  $\Delta S > 0$
- (4)  $\Delta H < 0$  and  $\Delta S < 0$

Ans. (3)

65. Lithium has a bcc structure. Its density is  $530 \text{ kg m}^{-3}$  and its atomic mass is  $6.94 \text{ g mol}^{-1}$ . Calculate the edge length of a unit cell of Lithium metal. ( $N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$ )

- (1) 154 pm (2) 352 pm  
(3) 527 pm (4) 264 pm

Ans. (2)

66. Which one of the following orders is correct for the bond dissociation enthalpy of halogen molecules?

- (1)  $I_2 > Br_2 > Cl_2 > F_2$   
(2)  $Cl_2 > Br_2 > F_2 > I_2$   
(3)  $Br_2 > I_2 > F_2 > Cl_2$   
(4)  $F_2 > Cl_2 > Br_2 > I_2$

Ans. (2)

67. Which of the following is an analgesic ?

- (1) Novalgin  
(2) Penicillin  
(3) Streptomycin  
(4) Chloromycetin

Ans. (1)

68. Equal moles of hydrogen and oxygen gases are placed in a container with a pin-hole through which both can escape. What fraction of the oxygen escapes in the time required for one-half of the hydrogen to escape ?

- (1)  $1/8$  (2)  $1/4$   
(3)  $3/8$  (4)  $1/2$

Ans. (1)

69. Consider the nitration of benzene using mixed conc.  $H_2SO_4$  and  $HNO_3$ . If a large amount of  $KHSO_4$  is added to the mixture, the rate of nitration will be:-

- (1) faster  
(2) slower  
(3) unchanged  
(4) doubled

Ans. (2)

70. Predict the correct order among the following :-

- (1) lone pair- lone pair > lone pair - bond pair > bond pair - bond pair  
(2) lone pair - lone pair > bond pair - bond pair > lone pair - bond pair  
(3) bond pair - bond pair > lone pair - bond pair > lone pair - lone pair  
(4) lone pair - bond pair > bond pair - bond pair > lone pair - lone pair

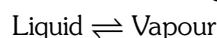
Ans. (1)

71. The product obtained as a result of a reaction of nitrogen with  $CaC_2$  is :-

- (1)  $Ca(CN)_2$  (2)  $CaCN$   
(3)  $CaCN_3$  (4)  $Ca_2CN$

Ans. (Bonus)

72. Consider the following liquid - vapour equilibrium.



Which of the following relations is **correct** ?

- (1)  $\frac{d \ell n G}{dT^2} = \frac{\Delta H_v}{RT^2}$  (2)  $\frac{d \ell n P}{dT} = \frac{-\Delta H_v}{RT}$   
(3)  $\frac{d \ell n P}{dT^2} = \frac{-\Delta H_v}{T^2}$  (4)  $\frac{d \ell n P}{dT} = \frac{\Delta H_v}{RT^2}$

Ans. (4)

73. Match the compounds given in column I with the hybridisation and shape given in column II and mark the **correct** option.

Column-I		Column-II	
(a)	$XeF_6$	(i)	Distorted octahedral
(b)	$XeO_3$	(ii)	Square planar
(c)	$XeOF_4$	(iii)	pyramidal
(d)	$XeF_4$	(iv)	Square pyramidal

Code :-

- |     | (a)  | (b)   | (c)  | (d)   |
|-----|------|-------|------|-------|
| (1) | (i)  | (iii) | (iv) | (ii)  |
| (2) | (i)  | (ii)  | (iv) | (iii) |
| (3) | (iv) | (iii) | (i)  | (ii)  |
| (4) | (iv) | (i)   | (ii) | (iii) |

Ans. (1)

74. Which of the following has longest C-O bond length? (Free C-O bond length in Co is  $1.128 \text{ \AA}$ .)

- (1)  $Ni(CO)_4$   
(2)  $[Co(CO)_4]^{\ominus}$   
(3)  $[Fe(CO)_4]^{2-}$   
(4)  $[Mn(CO)_6]^+$

Ans. (3)

75. The pressure of  $H_2$  required to make the potential of  $H_2$ -electrode zero in pure water at 298 K is :-

- (1)  $10^{-14} \text{ atm}$   
(2)  $10^{-12} \text{ atm}$   
(3)  $10^{-10} \text{ atm}$   
(4)  $10^{-4} \text{ atm}$

Ans. (1)

76. The addition of a catalyst during a chemical reaction alters which of the following quantities ?

- (1) Entropy
- (2) Internal energy
- (3) Enthalpy
- (4) Activation energy

Ans. (4)

77. The ionic radii of  $A^+$  and  $B^-$  ions are  $0.98 \times 10^{-10}m$  and  $1.81 \times 10^{-10} m$ . The coordination number of each ion in AB is :-

- (1) 6
- (2) 4
- (3) 8
- (4) 2

Ans. (1)

78. Which is the **correct** statement for the given acids?

- (1) Phosphinic acid is a diprotic acid while phosphonic acid is a monoprotic acid
- (2) Phosphinic acid is a monoprotic acid while phosphonic acid is a diprotic acid
- (3) Both are triprotic acids
- (4) Both are diprotic acids

Ans. (2)

79. Fog is colloidal solution of :-

- (1) Liquid in gas
- (2) Gas in liquid
- (3) Solid in gas
- (4) Gas in gas

Ans. (1)

80. Which of the following statement about the composition of the vapour over an ideal a 1 : 1 molar mixture of benzene and toluene is **correct**? Assume that the temperature is constant at  $25^\circ C$ . (Given : Vapour Pressure Data at  $25^\circ C$ , benzene = 12.8 kPa, Toluene = 3.85 kPa)

- (1) The vapour will contain a higher percentage of benzene
- (2) The vapour will contain a higher percentage of toluene
- (3) The vapour will contain equal amounts of benzene and toluene
- (4) Not enough information is given to make a predication

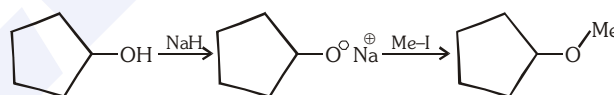
Ans. (1)

81. The **correct** statement regarding the comparison of staggered and eclipsed conformation of ethane, is :-

- (1) The staggered conformation of ethane is less stable than eclipsed conformation, because staggered conformation has torsional strain
- (2) The eclipsed conformation of ethane is more stable than staggered conformation, because eclipsed conformation has no torsional strain
- (3) The eclipsed conformation of ethane is more stable than staggered conformation even through the eclipsed conformation has torsional strain
- (4) The staggered conformation of ethane is more stable than eclipsed conformation, because staggered conformation has no torsional strain.

Ans. (4)

82. The reaction



Can be classified as :-

- (1) Williamson ether synthesis reaction
- (2) Alcohol formation reaction
- (3) Dehydration reaction
- (4) Williamson alcohol synthesis reaction

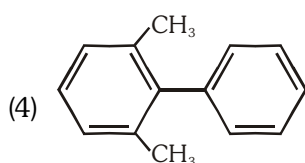
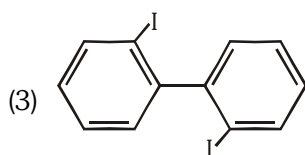
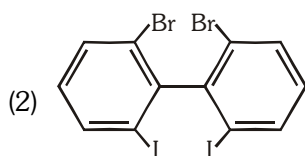
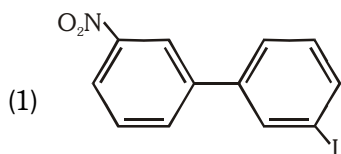
Ans. (1)

83. The product formed by the reaction of an aldehyde with a primary amine is :-

- (1) Schiff base
- (2) Ketone
- (3) Carboxylic acid
- (4) Aromatic acid

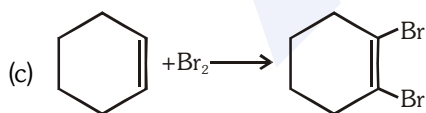
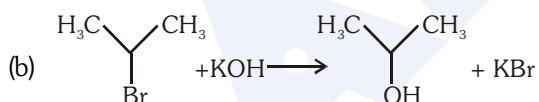
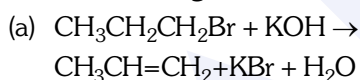
Ans. (1)

84. Which of the following biphenyls is optically active?



Ans. (2)

85. For the following reactions :-



Which of the following statements is **correct** ?

- (1) (a) and (b) are elimination reaction and (c) is addition reaction
- (2) (a) is elimination, (b) is substitution and (c) is addition reaction
- (3) (a) is elimination, (b) and (c) are substitution reactions
- (4) (a) is substitution, (b) and (c) are addition reaction

Ans. (2)

86. At 100°C the vapour pressure of a solution of 6.5g of a solute in 100 g water is 732 mm. If  $K_b = 0.52$ , the boiling point of this solution will be :-

- (1) 101°C
- (2) 100°C
- (3) 102°C
- (4) 103°C

Ans. (1)

87. The **correct** statement regarding RNA and DNA, respectively is :

- (1) The sugar component in RNA is arabinose and the sugar component in DNA is 2'-deoxyribose.
- (2) The sugar component in RNA is ribose and the sugar component in DNA is 2'-deoxyribose.
- (3) The sugar component in RNA is arabinose
- (4) The sugar component in RNA is 2'-deoxyribose and the sugar component in DNA is arabinose.

Ans. (2)

88. The **correct** statement regarding the basicity of arylamines is :-

- (1) Arylamines are generally less basic than alkylamines because the nitrogen lone-pair electrons are delocalized by interaction with the aromatic ring  $\pi$  electron system.
- (2) Arylamines are generally more basic than alkylamines because the nitrogen lone-pair electrons are not delocalized by interaction with the aromatic ring  $\pi$  electron system.
- (3) Arylamines are generally more basic than alkylamines because of aryl group.
- (4) Arylamines are generally more basic than alkylamines, because the nitrogen atom in arylamines is sp-hybridized.

Ans. (1)

89. Which one given below is a non-reducing sugar ?

- (1) Maltose
- (2) Lactose
- (3) Glucose
- (4) Sucrose

Ans. (4)

90. The pair of electron in the given carbanion,  $\text{CH}_3\text{C} \equiv \text{C}^-$ , is present in which of the following orbitals ?

- (1) 2p
- (2)  $\text{sp}^3$
- (3)  $\text{sp}^2$
- (4) sp

Ans. (4)