JEE Main Test-2018 (Chemistry)

31. The ratio of mass percent of C and H of an organic compound $(C_XH_YO_Z)$ is 6 : 1. If one molecule of the above compound $(C_XH_YO_Z)$ contains half as much oxygen as required to burn one molecule of compound C_XH_Y completely to CO_2 and H_2O. The empirical formula of compound $C_XH_YO_Z$ is

(1) $C_3H_6O_3$ **(2)** C_2H_4O

(3) $C_3H_4O_2$ **(4)** $C_2H_4O_3$

Sol. [4]

32. Which type of 'defect' has the presence of cations in the interstitial sites ?

(1) Schottky defect **(2)** Vacancy defect

(3) Frenkel defect **(4)** Metal defciency defect

Sol. [3]

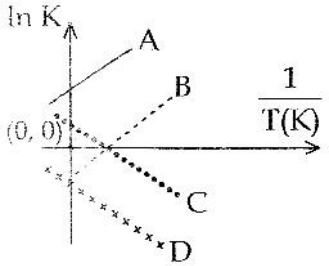
33. According to molecular orbital theory, which of the following will not be a viable molecule ?

(1) He_2^{2+} **(2)** He_2^{+}

(3) H_2^{-} **(4)** H_2^{2-}

Sol. [4]

34. Which of the following lines correctly show the temperature dependence of equilibrium constant, K, for an exothermic reaction?



(1) A and B **(2)** B and C

(3) C and D **(4)** A and D

Sol. [1]

35. The combustion of benzene (I) gives $CO_2(g)$ and $H_2O(l)$. Given that heat of combustion of benzene at constant volume is – 3263.9 kJ mol^{-1} at 25°C; heat of combustion (in kJ mol^{-1}) of benzene at constant pressure will be :

($R = 8.314$ JK^{-1} mol^{-1})

(1) 4152.6 **(2)** – 452.46

(3) 3260 **(4)** – 3267.6

Sol. [4]

36. For 1 molal aqueous solution of the following compounds, which one will show the highest freezing point ?

(1) $[Co(H_2O)]Cl_3$

(2) $[Co(H_2O)Cl]Cl_2.H_2O$

(3) $[Co(H_2O)_4Cl_2]Cl.2H_2O$

(4) $[Co(H_2O)_3Cl_3].3H_2O$

Sol. [4]

37. An aqueous solution contains 0.10 M H_2S and 0.20 M HCl. If the equilibrium constants for the formation of HS^- from H_2S is 1.0×10^{-7} and that of S^{2-} from HS^- ion is 1.2×10^{-13} then the concentration of S^{2-} ions in aqueous solution is

(1) 5×10^{-8} **(2)** 3×10^{-20}

(3) 6×10^{-21} **(4)** 5×10^{-19}

Sol. [2]

38. An aqueous solution contains an unknown concentration of Ba^{2+}. When 50 mL of a 1 M solution of Na_2SO_4 is added, $BaSO_4$ just begins to precipitate. The final volume is 500 mL. The solubility product of $BaSO_4$ is 1×10^{-10}. What is the original cocnentration of Ba^{2+} ?

(1) 5×10^{-9} M **(2)** 2×10^{-9} M

(3) 1.1×10^{-9} M **(4)** 1.0×10^{-10} M

Sol. [3]

39. At 518° C, the rate of decomposition of a sample of gaseous acetaldehyde, initially at a pressure, of 363 Torr, was 1.00 Torr s^{-1} when 5% had reacted and 0.5 Torr s^{-1} when 33% had reacted. The order of the reaction is

(1) 2 **(2)** 3

(3) 1 **(4)** 0

Sol. [1]

40. How long (approxiate) should water be electrolysed by passing through 100 amperes current so that the oxygen released can completely burn 27.66 g of diborane? (Atomic weight of B = 10.8 u)

(1) 6.4 hours **(2)** 0.8 hours

(3) 3.2 hours **(4)** 1.6 hours

Sol. [3]

41. The recommened concentration of fluoride ion in drinking water is up to 1 ppm as fluoride ion is required to make teeth enamel harder by converting $[3Ca_3(PO_4)_2.Ca(OH)_2]$ to

(1) $[CaF_2]$ **(2)** $[3(CaF_2).Ca(OH)_2]$

(3) $[3Ca_3(PO_4)_2.CaF_2]$ **(4)** $[3\{Ca(OH_2)\}.CaF_2]$

Sol. [4]

42. Which of the following compound contain(s) no covalent bond(s) ?

KCl, PH_3, O_2, B_2H_6, H_2SO_4

(1) KCl, B_2H_6, PH_3 **(2)** KCl, H_2SO_4

(3) KCl **(4)** KCl, B_2H_6

Sol. [3]

43. Which of the following are Lewis acids?

(1) PH_3 and BCl_3 **(2)** $AlCl_3$ and $SiCl_4$

(3) PH_3 and $SiCl_4$ **(4)** BCl_3 and $AlCl_3$

Sol. [4]

44. Total number of lone pair of electrons in I_3^- ion is

(1) 3 **(2)** 6

(3) 9 **(4)** 12

Sol. [3]

45. Which of the following salts is the most basic in aqueous solution?

(1) $Al(CN)_3$ **(2)** CH_3COOK

(3) $FeCl_3$ **(4)** $Pb(CH_3COO)_2$

Sol. [2]

46. Hydrogen peroixde oxides $[Fe(CN)_6]^{4-}$ to $[Fe(CN)_6]^{3-}$ in acidic medium but reduces $[Fe(CN)_6]^{3-}$ to $[Fe(CN)_6]^{4-}$ in alkaline medium. The other products formed are, respectively

(1) $(H_2O + O_2)$ and H_2O

(2) $(H_2O + O_2)$ and $(H_2O + OH^-)$

(3) H_2O and $(H_2O + O_2)$

(4) H_2O and $(H_2O + OH^-)$

Sol. [3]

47. The oxidation state of Cr in $[Cr(H_2O)_6]Cl_3$ $[Cr(C_6H_6)_2]$ and $K_2[Cr(CN)_2(O_2)(O_2)(NH_3)]$ respectively are

(1) + 3, + 4 and + 6

(2) + 3, + 2 and + 4

(3) + 3, 0 and + 6

(4) + 3, 0 and + 4

Sol. [4]

48. The compound that does not produce nitrogen gas by the thermal decomposition is

(1) $Ba(N_3)_2$

(2) $(NH_4)_2Cr_2O_7$

(3) NH_4NO_2

(4) $(NH_4)_2SO_4$

Sol. [4]

49. When metal 'M' is traeted with NaOH, a white gelatinous precipitate 'X' is obtained, which is soluble in excess of NaOH. Compound 'X' when heated strongly gives an oxide which is used in chromatography as an adsorbent. The metal 'M' is

(1) Zn **(2)** Ca

(3) Al **(4)** Fe

Sol. [3]

50. Consider the followring reaction and statements

$[Co(NH_3)_4Br_2]^+ + Br^- \rightarrow [Co(NH_3)_3Br_3] + NH_3$

(I) Two isomers are produced if the reactant complex ion is a cis-isomer

(II) Two isomers are produced if the reactant complex ion is a trans-isomer

(III) Only one isomer is produced if the reactant complex ion is a trans-isomers

(IV) Only one isomer is produced if the reactant complex ion is a cis-isomer

The correct statement are

(1) I and II **(2)** I and III

(3) III and IV **(4)** II and IV

Sol. [2]

51. Glucose on prolonged heating with HI gives

(1) *n*-Hexane **(2)** 1-Hexene

(3) Hexanoic acid **(4)** 6-iodohexanal

Sol. [1]

52. The trans-alkenes are formed by the reduction of alkynes with

(1) $H_2 - Pd/C, BaSO_4$

(2) $NaBH_4$

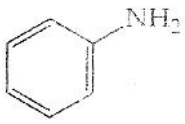
(3) Na/liq. NH_3

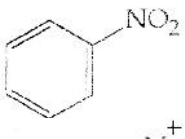
(4) Sn - HCl

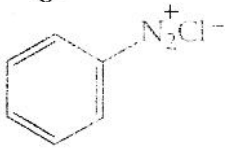
Sol. [3]

53. Which of the following compound will be suitable for Kjeldahl's method for nitrogen estimation?

(1) 

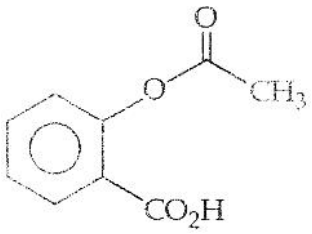
(2) 

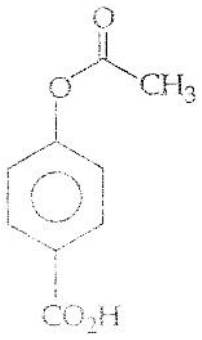
(3) 

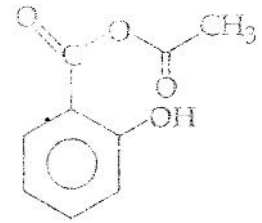
(4) 

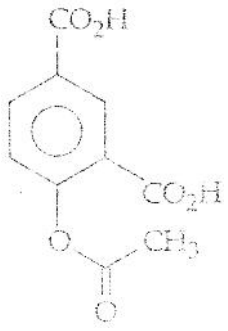
Sol. [2]

54. Phenol on treatment with CO_2 in the presence of NaOH followed by acidification produces compound X as the major product. X on treatment with $(CH_3CO)_2O$ in the presence of catalytic amount of H_2SO_4 produces:

(1) 

(2) 

(3) 

(4) 

Sol. [1]

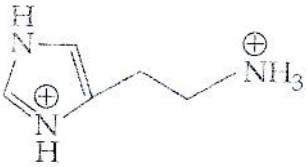
55. An alkali is titrated against an acid with methyl orange an indicator, which of the following is a correct combination?

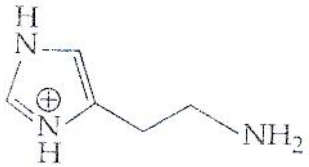
	Base	Acid	End point
(1)	Weak	Strong	Colourless to pink
(2)	Strong	Strong	Pinkish red to yellow
(3)	Weak	Strong	Yellow to pinkish red
(4)	Strong	Strong	Pink to colourless

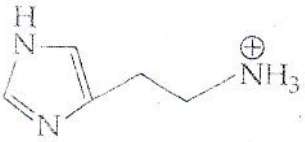
Sol. [3]

56. The predominant form of histamine present in human blood is (pk_a, Histidine = 6.0)

(1) 

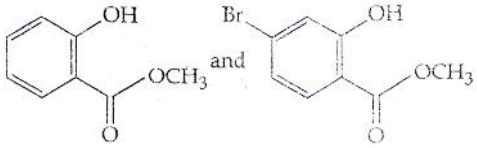
(2) 

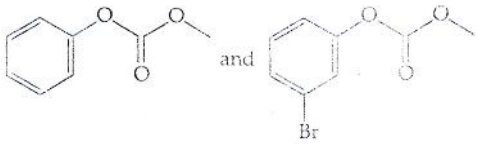
(3) 

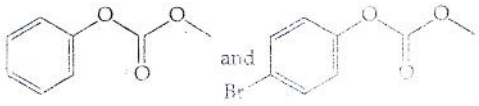
(4) 

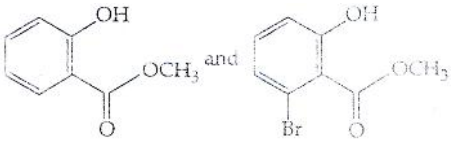
Sol. [1]

57. Phenoal reacts with methyl chloroformate in the presence of NaOH to form product A. A reacts with Br_2 to form product B. A and B are respectively.

(1) 

(2) 

(3) 

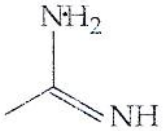
(4) 

Sol. [3]

58. The increasing order of basicity of the following compuonds is

(a) 

(b) 

(c) 

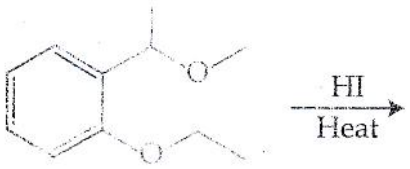
(d) 

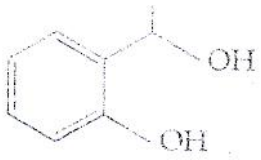
(1) (a) < (b) < (c) < (d) **(2)** (b) < (a) < (c) < (d)

(3) (b) < (a) < (d) < (c) **(4)** (d) < (b) < (a) < (c)

Sol. [3]

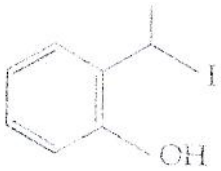
59. The major product in the following reactions is



(1) 

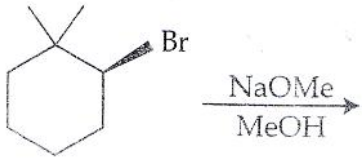
(2) 

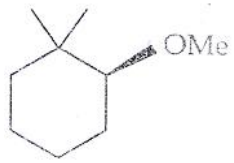
(3) 

(4) 

Sol. [4]

60. The major product of the following reactions is



(1) 

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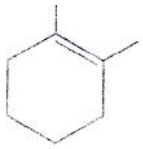
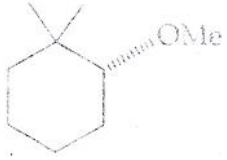
(3) 

(4) 

Sol. [2]