50. The mass defect of the nuclear reaction: $_5B^8 \rightarrow {}_4Be^8 + e^+$ is
(A) m = At, mass of $_5B^8$ – At. mass of $_4Be^8$
(B) m = At, mass of $_5B^8$ – At. mass of $_4Be^8$+mass of one electron
(C) m = At, mass of $_5B^8$ – At. mass of $_4Be^8$–mass of one electron
(D) m = At, mass of $_5B^8$ – At. mass of $_4Be^8$+mass of two electron

51. An electron is allowed to move freely in a closeed cubic box of length of side 10 cm. The maximum uncertainty in its velocity will be –
(A) 3.35×10^{-3} m/sec (B) 5.8×10^{-4} m/sec
(C) 4×10^{-5} m/sec (D) 4×10^{-6}

52. A single e^- in an ion has ionization energy equal to 217.6 ev. What is total no. of neutrons present in one ion of it?
(A) 2 (B) 4 (C) 5 (D) 9

53. A small particle of mass m in such a way that P.E. = – 1/2 mKr^2, where K is a constant and r is distance of particle from origin. Assuming Bohr's model of quantization of angular momentum and circular orbit, r is directly proportional to –
(A) n^2 (B) n (C) $\sqrt{n}$ (D) None

54. If value of l = 0 to (n + 1) then calculate max. no. of elements in II period of pariodic table
(A) 2 (B) 8 (C) 18 (D) 32

55. When 2L mixture of CO & CO_2 is passed over red hot charoal, its volume increased by 1.4 times. If all the volume measurement one made under similar conditions of P & P. Find out the % composition of mixture –
(A) 40 %, 60% (B) 60 %, 40 % (C) 50 %, 50% (D) 70 %, 30 %

56. 0.8 mole of a mixture of CO & CO_2 requires exactly 40 gm of NaOH is solution for conversion of all the CO_2 into Na_2CO_3. How many moles of NaOH would it requires for conversion nito Na_2CO_3 if the mixture (0.8 mle) is completely oxidised to CO_2?
(A) 0.2 (B) 0.6 (C) 1 (D) 1.5

57. The total no. of neutrons present is 54 ml H_2O (ℓ) are –
(A) 3 N_A (B) 30 N_A (C) 24 N_A (D) None of these

58. The sulphate of a metal contains 20% metal. This sulphate is isomorphous with zinc sulphate hepta hydrate. The atomic mass of the metal is–

(A) 30 (B) 12 (C) 24 (D) 36

59. If w_1 g of a metal X displaces w_2 g of another metal Y from its salt solution and if the equivalent weights are E_1 and E_2 respectively, the correct expression for the equivalent weight of X is :

(A) $E_1 = \frac{w_1}{w_2} \times E_2$ (B) $E_1 = \frac{w_2 \times E_2}{w_1}$ (C) $E_1 = \frac{w_1 \times w_2}{E_2}$ (D) $E_1 = \sqrt{\frac{w_1}{w_2} \times E_2}$

60. A metal oxide is reduced by heating it in a stream of hydrogen. It is found that after complete reduction, 3.15 g of oxide yielded 1.05 g of metal. From the above data we can say that

(A) The atomic weight of metal is 8 (B) The atomic weight of metal is 4

(C) The equivalent weight of metal is 4 (D) The equivalent weight of metal is 8

61. 100 mL of 0.1 N hypo decolourised iodine by the addition of x gram of crystalline copper sulphate to excess of KI. The value of 'x' is

(molecular wt. of $CuSO_4.5H_2O$ is 250)

(A) 5.0 g (B) 1.25 g (C) 2.5 g (D) 4 g

62. Which of the following is not a redox reaction?

(A) $2Na + Cl_2 \rightarrow 2NaCl$ (B) $C + O_2 \rightarrow CO_2$

(C) $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$ (D) $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$

63. The value of n in

$MnO_4^- + 8H^+ + ne^- \rightarrow Mn^{2+} + 4H_2O$ is

(A) 5 (B) 4 (C) 2 (D) 3

64. When $KMnO_4$ acts as an oxidizing agent and ultimately forms MnO_4^{2-}, MnO_2, Mn_2O_3 and Mn^{2+} then number of electrons transferred in each case respectively are–

(A) 4, 3, 1, 5 (B) 1, 5, 3, 7 (C) 1, 3, 4, 5 (D) 3, 5, 7, 1

65. The ratio between the root mean square velocity of H_2 at 50 K and that of O_2 at 800 K is

(A) 1 (B) 4 (C) 2 (D) 1/4

66. 1.22 g of a gas measured over water at 15ºC and a pressure of 775 mm of mercury occupied 900 mL. Calculate the volume of dry gas at NTP (vapour pressure of water at 15ºC is 14 mm).

(A) 372.21 mL (B) 854.24 mL (C) 869.96 mL (D) 917. 76 mL

67. A bhalloon filled with methane gas is pricked with a sharp point and quickly plunged into a tank of hydrogen at the same pressure. After sometime, the balloon will have

(A) Enlarged (B) Collapsed

(C) Remained unchanged in size (D) Unpredictable

68.

Gas	CO	CH_4	HCl	SO_2
Critical temp.T_c(K)	134	190	324	430

In the context of given values of critical temperature, the greter ease of liquefication is of

(A) SO_2 (B) HCl (C) CH_4 (D) CO

69. In the heterogeneous equilibrium:

$CaCO_3(s) \rightleftharpoons NH_3(g)$; $K_p = 4.0 \times 10^4$

what would be the effect of addition of $CaCO_3$ on the equilibrium concentration of CO_2?

(A) increases (B) Unpredictable (C) Decreases (D) Remains unaffected

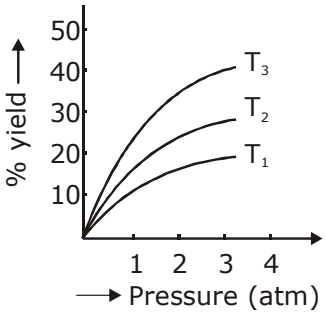
70. What is ΔG^o for the following reaction?
$1/2\ N_2(g) + 3/2\ H_2(g) \rightleftharpoons NH_3(g)$; $K_p = 4.0 \times 10^4$ at 25ºC
(A) –26.5 kJ mol^{-1} (B) –11.5 kJ mol^{-1} (C) – 2.2 kJ mol^{-1} (D) – 0.97 kJ mol^{-1}

71. Reaction K
$1/2N_2(g) + O_2(g) \rightleftharpoons NO_2(g)$ K_1
$1/2N_2(g) + O_2(g) \rightleftharpoons NO_2(g)$ K_2
Using above equations, write down expression for K of the following reaction :
$N_2O_2(g) \rightleftharpoons N_2(g) + 2O_2(g)$

(A) K_1K_2 (B) $\frac{K_2^2}{K_1}$ (C) $\frac{1}{K_2K_1}$ (D) $\frac{1}{K_1^2K_2}$

72. In Haber's process, the ammonia is manufactured according to the following reaction:
$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$; $\Delta H^o = -(22.4\ kJ)$
The pressure inside the chamber is maintained at 200 atm and temperature at 500ºC. Generally, this reaction is carried out in presence of Fe catalyst.

The preparation of ammonia by Haber's process an exothermic reaction. If the preparation follos the following temperature pressure relationship for its % yield. Then for temperature T_1, T_2 and T_3 the correct option is :



(A) $T_3 > T_2 > T_1$ (B) $T_1 > T_2 > T_3$
(C) $T_1 = T_2 = T_3$ (D) Nothing could be predicted

73. In Haber's process, the ammonia is manufactured according to the following reaction:
$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$; $\Delta H^o = -(22.4\ kJ)$
The pressure inside the chamber is maintained at 200 atm and temperature at 500ºC. Generally, this reaction is carried out in presence of Fe catalyst.

If K_p for the reaction is 1.44×10^{-5} then the value of K_p for the decomposition of NH_3,
$2NH_3(g) \rightleftharpoons N_2(g) + 3H_2(g)$
will be:

(A) $\sqrt{1.44 \times 10^{-5}}$ (B) $(1.44 \times 10^{-5})^2$ (C) $\frac{1}{1.44 \times 10^{-5}}$ (D) 2.88×10^{-5}

74. In Haber's process, the ammonia is manufactured according to the following reaction:
$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$; $\Delta H^o = -(22.4\ kJ)$
The pressure inside the chamber is maintained at 200 atm and temperature at 500ºC. Generally, this reaction is carried out in presence of Fe catalyst.

For which of these processes is the value of ΔS negative ?
a. Sugar is dissolved in water
b. Stream condenses on a surface
c. $CaCO_3$ is decomposed into CaO and CO_2
(A) a only (B) b only (C) a and c only (d) b and c only

75. Consider this equation and the associated value for ΔH^o.

$2H_2(g) + 2Cl_2(g) \rightarrow 4HCl(g)$; $\Delta H^o = -92.3$ kJ

Which statement about this information is incorrect?

(A) If the equation is reversed, the ΔH^o value equals + 92.3 kJ

(B) The four HCl bonds are stronger than four bonds in H_2 and Cl_2

(C) The ΔH^o value will be –92.3 kJ if HCl is produced as a liquid

(D) 23.1 kJ of heat will be evolved when 1 mole of HCl (g) is produced