CHEMISTRY

AAKASH INSTITUTE ENGLISH

TEST 3

Example

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1. If helium gas is added at constant pressure to the following reaction at equilibrium $CO(g) + 3H_2(g) \Leftrightarrow CH_4(g) + H_2O(g)$, then

    A. Formation of methane will increase

B. Equilibrium shifts in backward direction

C. No effect on equilibrium

D. Activation energy of the reaction will decrease

Answer:

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2. In Haber's process for manufacture of ammonia promoter and catalyst are respectively

A. Fe

B. Co

C. V_2O_5

D. Pt

Answer:

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3. Calcium phosphide on complete hydrolysis gives

A. PH_3

B. H_3PO-4

C. H_2PO_2

D. H_3PO_3

Answer:

4. If the mass percentage of urea in an aqueous solution is 20% then molality of the solution will be

    A. 5.25 m

    B. 2.35 m

    C. 4.17 m

    D. 4.31 m

Answer:

5. Which of the following aq. solutions will freeze at highest temperature?

A. 0.1 m $NaCl$

B. 0.1 m glucose

C. 0.1m $CaCl_2$

D. 0.1 m $AICI_3$

Answer:

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6. Number of tetrahedral voids occupied in a unit cell of diamond is

A. 2

B. 4

C. 6

D. 8

Answer:

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7. Incorrect statement about carbohydrates is

A. Maltose is a reducing sugar.

B. The carbohydrates are stored in animal body as glycogen.

C. Amylopectin constitutes about 15-20% of starch.

D. Cellulose is composed of only B-D- glucose units.

Answer:

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8. Equanil is used as

A. Analgesic

B. Antibiotic

C. Tranquilizer

D. Antacid

Answer:

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9. In a gaseous reaction at equilibrium , 'n' mole of reactant 'A' decompose to give 1 mole each of C and D.It has been found that degree of dissociation of A at equilibrium is independent of total pressure.Value of 'n' is :

A. 1

B. 0

C. 2

D. 3

Answer:

10. A sample of gas occupies volume of 2.74 dm^3 at 0.9 bar and $27°C$. What will be the volume at 0.75 bar and $15°C$?

A.

B.

Answer:

11. Calculate the temperature of 5.0 mol of a gas occupying 5 dm^3 at 3.32 bar pressure. (R = 0.083 bar $dm^3 K^{-1} mol^{-1}$)

A.

B.

Answer:

12. A sample of gas occupies volume of 2 dm^3 at 0.9 bar and $25°C$. What will be the volume at 0.5 bar and $15°C$?

A.

B.

Answer:

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13. What will be the minimum pressure required to compress 300 dm^3 of air at 1 bar to 200 dm^3 at $30°C$?

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14. TiO_2 sol can be most easily coagulated by

A. PO_4^{-3}

B. SO_4^{2-}

C. Al^{3+}

D. Ca^{2+}

Answer:

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15. Which pollutant causes brown mottling of teeth?

A. Lead

B. Nitrate

C. Arsenic

D. Fluoride

Answer:

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16. The metal which is purified by Zone refining is

A. Ni

B. Zn

C. In

D. Fe

Answer:

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17. For the galvanic cell

$Zn(s)[Zn^2 + (aq) |\ | Ag^+(aq)Ag(s)]$, Gº of the reaction in joule will be $E°_{Z\frac{n^2+}{Z}n} = -0.76V$,

$E°_{A\frac{g+}{A}g} = 0.80V$

A. -2.5F

B. -0.4 F

C. -3.12 F

D. 1.12 F

Answer:

18. How many gram of copper metal will be deposited when a solution of copper sulphate $(CuSO_4)$ is electrolysed with a current of 9.65 ampere for 10 minutes? (1F = 96500 C, Atomic mass of $Cu = 63.5$ u)

A. 2.5 g

B. 1.9 g

C. 3.6 g

D. 3.8 g

Answer:

19. If rate constatnt of a chemical reaction is $10^{-2}s^{-1}$ then the time required for the completion of 20% of the reaction will e

    A. 48.43 s

    B. 22.33 s

    C. 15.53 s

D. 65.31 s

Answer:

20. What will be the minimum pressure required to compress 400 dm^3 of air at 1 bar to 200 dm^3 at $30°C$?

A. 3 bar

B. 2.5 bar

C. 2 bar

D. 1.5 bar

Answer:

21. In mercury cell, the electrolyte used is

    A. A paste of NH_4Cl and $ZnCl_2$

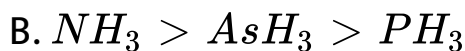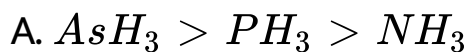   B. A paste of KOH and HgO

    C. 38% solution of sulphuric acid

    D. 20% solution of NaCl

Answer:

22. Correct order of boiling point of the given compounds is

A. $AsH_3 > PH_3 > NH_3$

B. $NH_3 > AsH_3 > PH_3$

C. $NH_3 > PH_3 > AsH_3$

D. $PH_3 > NH_3 > AsH_3$

Answer:

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23. Number of $B - O - B$ bondspresent in borax is

A. 4

B. 3

C. 5

D. 6

Answer:

24. The volume strength of 1.5 N H_2O_2 solution is

A. $8.4V$

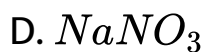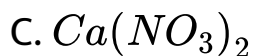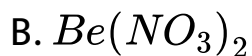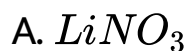B. $16.8V$

C. $5.6V$

D. $22.4V$

Answer:

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25. The values of the van der Waals constants for a gas a = 4.10 $dm^6 \mathrm{bar} mol^{-2}$ and b = 0.035 $dm^3 mol^{-1}$. Calculate the values of the critical temperature and critical pressure for the gas.

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26. Which metal nitrate does not give NO_2 on heating?
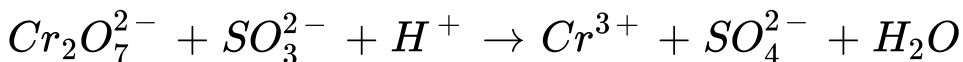
A. $LiNO_3$

B. $Be(NO_3)_2$

C. $Ca(NO_3)_2$

D. $NaNO_3$

Answer:

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27. For the following redox reaction the coefficients of the reactants for balanced reaction are

$$Cr_2O_7^{2-} + SO_3^{2-} + H^+ \rightarrow Cr^{3+} + SO_4^{2-} + H_2O$$

A. $1(Cr_2O_7^{2-}\ 4(SO_3^{2-}\ 7(H^+)$

B. $1(Cr_2O_7^{2-}\ 2(SO_3^{2-}\ 6(H^+)$

C. $1(Cr_2O_7^{2-}\ 4(SO_3^{2-}\ 8(H^+)$

D. $1(Cr_2O_7^{2-}\ 3(SO_3^{2-}\ 8(H^+)$

Answer:

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28. Among the following species highest bond order is of

A. NO^+

B. O_2^+

C. O_2^-

D. NO
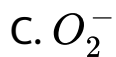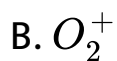
Answer:

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29. Calculate the pH at the equivalence point during the titration of 0.1M, 25 mL CH_3COOH with 0.05M NaOH solution. $\left[K_a(CH_3COOH) = 1.8 \times 10^{-5}\right]$

    A. 8.63

    B. 9.73

    C. 7.13

    D. 8.21

Answer:

30. Solubility of AgCl in 0.2 M magnesium chloride will be $\left(K_s p \, of \, AgCl = 1.8x10^{-10}\right)$

A. $1.8x10^{-10}$

B. $1.8x10^{-11}$

C. $9x10^{-10}$

D. $4.5x10^{-10}$

Answer:

31. Correct order of boiling point of the given compounds is

    A. Boiling of egg

    B. Evaporation of hexane

    C. Crystallization of molten NaCl

    D. Sublimation of naphthalene

Answer:

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32. The difference between heat of reaction at constant pressure and constant volume for the reaction

$$2C_4H_{10}(g) + 130_2(g) \rightarrow 8CO_2(g) + 10H_2O(l), at27°C$$

is

A. $7.48kJ$

B. $-17.46kJ$

C. $7.48kJ$

D. $37.41kJ$

Answer:

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33. Correct order of melting point of the given compounds is

A. $NaF > MgF_2 > AlF_3$

B. $AlF_3 > MgF_2 > NaF$

C. $MgF_2 > NaF > AlF_3$

D. $AlF_3 > NaF > MgF_2$
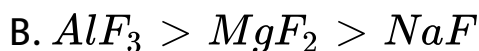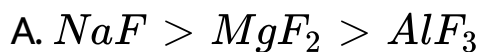
Answer:

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34. The density of a gas is found to be 1.56 g dm^{-3} at 0.98 bar pressure and $65°C$. Calculate the molar mass of the gas.

    A. 42 g/mol

    B. 44.66 g/mol

    C. 41 g /mol

    D. 40.44 g/mol

Answer:

35. Monomer of natural rubber is

A. $1, 3 - butadie \neq$

B. Isoprene

C. Styrene

D. Chloroprene

Answer:

36. Calculate the no. of mole in 132g of CO_2

A. 1

B. 2

C. 3

D. 5

Answer:

37. At $27°\,C$, K_p value for the reaction

$CaCO_3(s) \Leftrightarrow CaO(s) + CO_2(g)$, is 0.2 atm. K_C
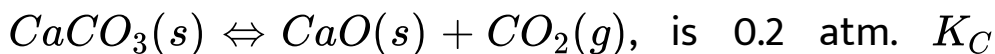
value for this reaction is

A. $4\text{x}10^{-3}$

B. $8\text{x}10^{-3}$

C. 6×10^{-3}

D. 2×10^{-3}

Answer:

38. For the reaction $C(s) + CO_2(g) \Leftrightarrow 2CO(g)$, the partial pressure of CO_2 and CO is 5.0atm amd 10 atm, respectively, at equilibrium. The K_p of the reaction is

A. 2atm

B. 10atm

C. 20atm

D. 15atm

Answer:

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39. Intramolecular hydrogen bonding is absent in

A. $o - Cresol$

B. Salicylaldehyde

C. Salicylic acid

D. Chloral hydrate

Answer:

40. In which of the following species the central atom

is $sp^3 d^2$ hybridised?

A. PCl_5

B. ClF_3

C. XeF_6

D. BrF_5

Answer:

41. Which among the following contains only one unpaired electron?

A. $[CoF_6]^{3-}$

B. $[Co(C_2O_4)_3]^{3-}$

C. $[Fe(CN)_6]^{3-}$

D. $[MnCl_6]^{3-}$
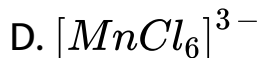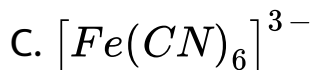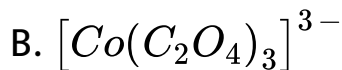
Answer:

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42. Which of the following arrangements shows the correct order of electron affinity of the four halogen

atoms I,Cl,Br,F?

A. $F > Cl > Br > I$

B. $I > Br > Cl > F$

C. $Cl > F > Br > I$

D. $I > Br > F > Cl$

Answer:

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43. Ratio of the total energy of electron in the second

orbit of Li^{2+} to the first orbit of He^+ is

A. $2:3$

B. $5:8$

C. $9:16$

D. $1:4$

Answer:

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44. 40 ml of 0.1 M $CaCl_2$ solution is mixed with 50 ml of $0.2 MAgNO_3$ solution. Mole of AgCl formed in the reaction is

A. $10^{-2} mol$

B. $4 \times 10^{-3} mol$

C. $8 \times 10^{-3} mol$

D. $0.2 mol$

Answer:

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45. The density of O_2 gas at 127° C and 4.0 atm pressure is (R = 0.082 L atm $K^{-1} mol^{-1}$)

A. 4.2 g/L

B. 3.9 g/L

C. 2.4 g/L

D. 1.5 g/L

Answer: C

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46. For effusion of equal volume, a gas takes twice the time as taken by methane under similar conditions. The molar mass of the gas is

A. 32 g/mol

B. 44 g/mol

C. 64 g/mol

D. 50 g/mol

Answer: A

47. The gas which will be most easily liquefied is

A. He

B. O_2

C. NH_3

D. CO_2

Answer: D

48. Ratio of the average speed of He and SO_2 at 27° C will be

    A. $4:1$

    B. $2:1$

    C. $8:1$

    D. $5:1$

Answer: A

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49. Heat of combustion of carbon monoxide is -283.5 kJ/mole. The heat released when 55 g of carbon dioxide formed from carbon monoxide is

    A. 283.5 kJ

    B. 324.2 kJ

    C. 354.4 kJ

    D. 385.5 kJ

Answer: D

50. The enthalpy and entropy change for the reaction, $Br_2(l) + CI_2(g) \rightarrow 2BrCl(g)$ are 7.1 kcal mol^{-1} and 25 cal $K^{-1}mol^{-1}$ respectively. This reaction will be spontaneous at

    A. $10^o C$

    B. 280 K

    C. 290 K

    D. $-5^o C$

Answer: A

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51. A gas expands in an insulated container against a constant external pressure of 1.5 atm from an initial volume of 1.2 L to 4.2 L. The change in internal energy (ΔU) of gas is nearly (1 L-atm = 101.3 J)

    A. $- 456J$

    B. $+ 456J$

    C. $- 402J$

    D. $+ 402J$

Answer: A

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52. At $127^{\circ}C$, heat of fusion of a compound is 4.8kJ/mol. Entropy change for the process is

A. $37.8JK^{-1}mol^{-1}$

B. $15JK^{-1}mol^{-1}$

C. $18.6JK^{-1}mol^{-1}$

D. $12JK^{-1}mol^{-1}$

Answer: A

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53. The root mean square speed at NTP for the gases CH_4, H_2, He and F_2 are in the order

    A. $CH_4 < H_2 < He < F_2$

    B. $H_2 < He < CH_4 < F_2$

    C. $H_2 < He < F_2 < CH_4$

    D. $F_2 < CH_4 < He < H_2$

Answer: C

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54. In vander waals gas equation, the term that accounts for the volume occupied by 'n' mole molecules is

A. (V - nb)

B. $\dfrac{an^2}{V^2}$

C. nb

D. $P + \dfrac{an^2}{V^2}$

Answer: A

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55. Ratio of everage kinetic energy of 14 g of N_2 at 27^oC to 24 g of O_2 at 227^oC is

    A. $1:5$

    B. $2:5$

    C. $1:4$

    D. $3:5$

Answer: D

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56. If the energy absorbed by each X_2 molecule of a gas is 3.5×10^{-19} J and the bond energy of X_2 is $180.6 kJmol^{-1}$ then the kinetic energy per atom will be

    A. $2.5 \times 10^{-19} J$

    B. $5.0 \times 10^{-20} J$

    C. $2.5 \times 10^{-20} J$

    D. $1.5 \times 10^{-19} J$

Answer: D

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57. The ratio of everage speed, most probable speed and root mean square speed of a gas sample will be

A. $\sqrt{\dfrac{4}{\pi}} : \sqrt{3} : \sqrt{2}$

B. $\sqrt{\dfrac{8}{\pi}} : \sqrt{2} : \sqrt{3}$

C. $\sqrt{\dfrac{16}{\pi}} : \sqrt{2} : \sqrt{3}$

D. $\sqrt{2} : \sqrt{\dfrac{9}{\pi}} : \sqrt{3}$

Answer: B

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58. The bond energies of H - H and I - I bonds are $435 kJmol^{-1}$ and $150 kJmol^{-1}$ respectively. If ΔH_f^o

for HI is $26.5 kJmol^{-1}$ then bond enthalpy of H-I bond

is

A. 558.5kJ/mol

B. 266kJ/mol

C. 611.5kJ/mol

D. 293kJ/mol

Answer: D

59. Select the state functions among the following.
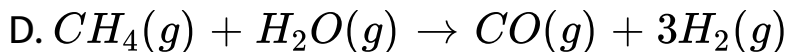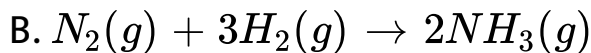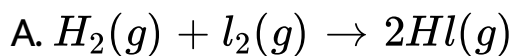
(i) U + PV (ii) S

(iii) q (iv) w

H - TS

A. (iii), (iv) and (v) only

B. (i), (ii) and (v) Only

C. (iii) and (iv) Only

D. (ii), (iii), (iv) and (v) Only

Answer: A

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60. For which of the following reactions, $\Delta H = \Delta U$?

A. $H_2(g) + l_2(g) \rightarrow 2Hl(g)$

B. $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$

C. `C(s) + H_2O(g) rightarrow CO(g) + H_2(g)

D. $CH_4(g) + H_2O(g) \rightarrow CO(g) + 3H_2(g)$

Answer: A

61. When 1.5 mol of a gas is heated at constant volume from 300 K to 350 K and the heat supplied to the gas is 750 J then the correct option is

A. $q = \Delta U = 750J, w = 0$

B. $q = w = 750J, \Delta U = 0$

C. $q = w = 750J, \Delta U = -750J$

D. $q = 750J, w = \Delta U = -750J$

Answer: C

62. When 5 moles of an ideal gas is expended at 350 K reversibly from 5 L to 40 L, then the entropy change for the process is (R = 2 cal $mol^{-1}K^{-1}$)

A. $9.01 calK^{-1}$

B. $20.8 calK^{-1}$

C. $-15.2 cal K^{-1}$

D. $22.3 cal K^{-1}$

Answer: C

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63. If the enthalpies of formation of $C_3H_8(g), CO_2(g)$ and $H_2O(l)$ at standard conditions are $-104kJmol^{-1}$, $-394kJmol^{-1}$ and $-286kJmol^{-1}$ respectively then the standard Enthalpy of combustion of 66 g of $C_3H_8(g)$ will be

A. $-2222kJ$

B. $-2500kJ$

C. $-784kJ$

D. $-3333kJ$

Answer: C

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64. A gaseous mixture contains 220 g of carbon dioxide and 280 g of nitrogen gas. If the partial pressure of nitrogen gas in the mixture is 1.5 atm then the partial pressure of carbon dioxide gas in the mixture will be

A. 1.25 atm

B. 0.75 atm

C. 0.50 atm

D. 3 atm

Answer: D

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65. An air bubble formed under water at temperature 17^oC and the pressure 1.8 atm started to move upwards and reaches the surface where temperature is 27^oC and pressure in 1 atm. The volume of the bubble at the surface will become

A. 2.32 times of the initial volume

B. 1.86 times of the initial volume

C. 0.5 times of the initial volume

D. 1.51 times of the initial volume

Answer: C

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66. Compressibility factor under critical state of a gas is

A. $\dfrac{5}{8}$

B. $\dfrac{8}{3}$

C. $\dfrac{3}{8R}$

D. $\dfrac{3}{8}$

Answer: D

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67. Ratio of the rate of effusion of oxygen gas at 1.5 atm to that of helium gas at 4.5 atm will be

A. $1 : 6\sqrt{2}$

B. $1 : 12\sqrt{2}$

C. $1 : 2\sqrt{2}$

D. $1 : 3$

Answer: A

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68. Standard enthalpy of formation is zero for

A. Diamond

B. $gra\phi te_3$

C. Br^-(aq)

D. $Cl_2(g)$

Answer: B

69. The work done by one mole of ideal gas when its teperature is increased by $1^{o}C$ at constant pressure is

A. $\dfrac{R}{2}$

B. 2R

C. R

D. 4R

Answer: C

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70. A liquid is in equilibrium with its vapour at a certain temperature. If $\Delta H_{vap} = 60.24 kJmol^{-1}$ and $\Delta S_{vap} = 150.6 Jmol^{-1}$ then the boiling point of the liquid will be

A. 275 K

B. 375 K

C. 350 K

D. 400 K

Answer: C

71. For which of the following processes, entropy change is negative?

    A. Evaporation of water

    B. Sublimation of camphor

    C. Condensation of iodine vapour

    D. Melting of ice

Answer: D

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72. Unit of surface tension is

A. Nm^2

B. Nm^{-2}

C. Nm^{-1}

D. Nm

Answer: D

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73. If 200 ml of $0.1MH_2SO_4$ solution is mixed with 200 ml of 0.15 M NaOH solution then heat evolve during the neutralization process is

A. 411 cal

B. 548 cal

C. 959 cal

D. 822 cal

Answer: A

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74. Which among the following will boil at highest temperature?

A. HCl

B. HF

C. HI

D. HBr

Answer: A

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75. The specific gravity of CCl_4 vapour at$0^o C$ and 76 cmHg in grams/ litre is

A. 11.2

B. 77

C. 6.88

D. 5.86

Answer: B

76. A closed cylinder contains 40 g of SO_3 and 4 g of helium gas at 375 K. If the partial pressure of helium gas is 2.5 atm, then the volume of the container is (R = 0.082 L-atm $K^{-1} mol^{-1}$)

A. 18.45 L

B. 2.5 L

C. 15.5 L

D. 12.3 L

Answer: D

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77. The correct thermodynamic conditions for the spontaneous reaction at all temperature is

    A. $\Delta H > 0, \Delta S < 0$

    B. $\Delta H < 0, \Delta S > 0$

    C. $\Delta H > 0, \Delta S > 0$

    D. $\Delta H < 0, \Delta S < 0$

Answer: D

78. At high pressure, the compressibility factor for one mole of van der waals gas will be

A. $1 + \dfrac{b}{RT}$

B. $1 - \dfrac{Pb}{RT}$

C. $1 + \dfrac{Pb}{RT}$

D. $1 + \dfrac{a}{VRT}$

Answer: B

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79. The most probable speed of an ideal gas at constant pressure varies with density (d) as

A. $\sqrt{d}$

B. d^2

C. $\dfrac{1}{\sqrt{d}}$

D. $\dfrac{1}{d}$

Answer: B

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80. According to kinetic theory of gases, the incorrect statement is

    A. Collisions of gas molecules are perfectly elastic

    B. Particle of gas moves in all possible directions in straight line

    C. Gas molecules are considered as point masses

    D. At a particular tamperature all molecules have same kinetic energy

Answer: C

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81. The difference between heat of reaction at constant pressure and at constant volume for the reaction

$$C_6H_{12}(l) + 9O_2(g) \rightarrow 6CO_2(g) + 6H_2O(l), \, at 27^o C$$

is

    A. $-14.96kJ$

    B. $-7.48kJ$

    C. $+7.43kJ$

    D. $-10.23kJ$

Answer: C

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82. One mole of an ideal gas undergoes change of state from (4 L, 3 atm) to (6 L, 5 atm). If the change in internal energy is 45 L-atm then the change of enthalpy for the process is

    A. 27 L-atm
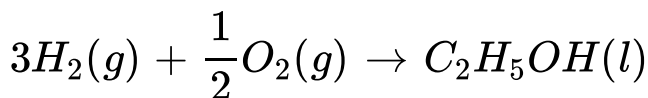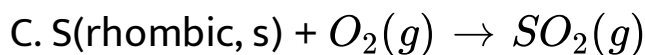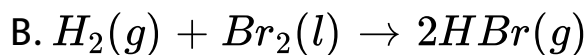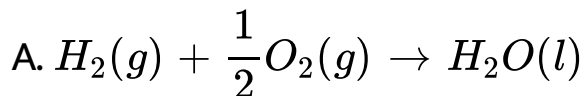
    B. 45 L-atm

    C. 55 L-atm

    D. 63 L-atm

Answer: D

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83. Enthalpy of which of the following reactions does not represent the standard enthalpy of formation?

A. $H_2(g) + \dfrac{1}{2}O_2(g) \rightarrow H_2O(l)$

B. $H_2(g) + Br_2(l) \rightarrow 2HBr(g)$

C. S(rhombic, s) + $O_2(g) \rightarrow SO_2(g)$

D. 2C (graphite, s)+ $3H_2(g) + \dfrac{1}{2}O_2(g) \rightarrow C_2H_5OH(l)$

Answer: B

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84. Five moles of an ideal gas undergoes reversible expansion from 1 L to 4 L at $27^o C$. The work done and enthalpy change for the process respectively are

A. $-12.5kJ$ and $-18.2kJ$

B. $-17.3kJ$ and $0kJ$

C. $+17.3kJ$ and $+22.5kJ$

D. $+21.5kJ$ and $0kJ$

Answer: C

85. A chemical reaction takes place in a vessel of cross-sectional area 150 cm^2. Due to the reaction , the piston of the vessel is moved upward by 15 cm against the external pressure of one atm. The work done by the system is

A. $-3.35L - atm$

B. $+3.35L - atm$

C. $-2.25L - atm$

D. $-5.51L - atm$

Answer: A

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86. The amount of heat required to raise the temperature of 75 kg of ice at 0^oC to water at 10^oC is (latent heat of fusion of ice is 80 cal/g, specific heat of water is 1 cal/g^oC)

A. 750 kcal

B. $6.75 \times 10^3 kcal$

C. $60 \times 10^3 kcal$

D. 6.75 kcal

Answer: B

87. Which among the following is an intensive property?

A. Enthalpy

B. Entropy

C. Gibbs free energy

D. Pressure

Answer: B

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88. Which one of the following acids has highest heat of neutralization with one equivalent of NaOH?

A. HCl

B. HF

C. H_2SO_4

D. HCN

Answer: C

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89. In which of the following molecules, intermolecular

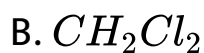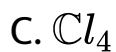attraction is purely London force?

A. $CHCl_3$

B. CH_2Cl_2

C. CCl_4

D. CH_3Cl

Answer: B

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Exercise

1. In which of the following molecules, intermolecular attraction is purely London force?
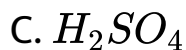
A. $CHCl_3$

B. CH_2Cl_2

C. Cl_4

D. CH_4Cl

Answer:

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2. Which one of the following acids has highest heat of neutralization with one equivalent of NaOH?

A. HCL

B. HF

C. H_2SO_4

D. HCN

Answer:

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3. Which among the following is an intensive property?

A. Enthalpy

B. Entropy

C. Gibbs free energy

D. Pressure

Answer:

4. The amount of heat required to raise the temperature of 75 kg of ice at 0^oC to water at 10^oC is (latent heat of fusion of ice is 80 cal/g, specific heat of water is 1 cal/g^oC)

    A. 750 kcal

    B. $6.75 x X 10^3$ kcal

    C. $60 x 10^3$ kcal

    D. 6.75 kcal

Answer:

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5. A chemical reaction takes place in a vessel of cross-sectional area 150 cm^2. Due to the reaction , the piston of the vessel is moved upward by 15 cm against the external pressure of one atm. The work done by the system is

    A. -3.35 L-atm

    B. +3.35 L-atm

    C. -2.25 L-atm

    D. -5.51 L-atm

Answer:

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6. Five moles of an ideal gas undergoes reversible expansion from 1 L to 4 L at $27^{o}C$. The work done and enthalpy change for the process respectively are
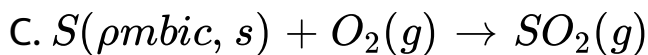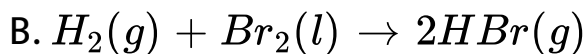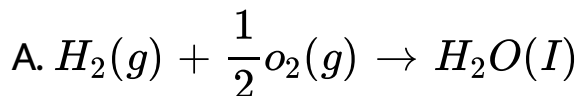
    A. -12.5 kJ and -18.2 kJ

    B. -17.3 kJ and 0 kJ

    C. +17.3 kJ and +225 kJ

    D. +21.5 kJ and 0 KJ

Answer:

7. Enthalpy of which of the following reactions does not represent the standard enthalpy of formation?

A. $H_2(g) + \dfrac{1}{2}O_2(g) \rightarrow H_2O(I)$

B. $H_2(g) + Br_2(l) \rightarrow 2HBr(g)$

C. $S(\rho mbic, s) + O_2(g) \rightarrow SO_2(g)$

D.

$$2C(gra\phi te, s) + 3H_2(g) + \frac{1}{2}O_2(g) \rightarrow C_2H_5OH(l)$$
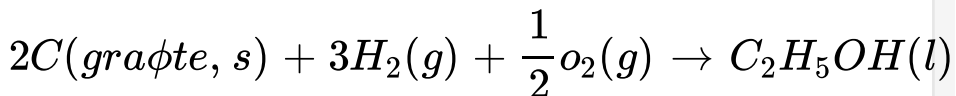
Answer:

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8. One mole of an ideal gas undergoes change of state from (4 L, 3 atm) to (6 L, 5 atm). If the change in internal energy is 45 L-atm then the change of enthalpy for the process is

    A. 27 L-atm

    B. 45 L-atm

    C. 55 L-atm

    D. 63 L-atm

Answer:

9. The difference between heat of reaction at constant pressure and at constant volume for the reaction

$$C_6H_{12}(l) + 9O_2(g) \rightarrow 6CO_2(g) + 6H_2O(l), \, at \, 27^\circ C$$

is

A. -14.96 Kj

B. -7.48 kJ

C. +7.43 kJ

D. -10.23 kJ

Answer:

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10. According to kinetic theory of gases, the incorrect statement is

    A. Collisions of gas molecules are perfectly elastic

    B. Particle of gas moves in all possible directions in straight line

    C. Gas molecules are considered as point masses

    D. At a particular temperature all molecules have same kinetic energy

Answer:

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11. The most probable speed of an ideal gas at constant pressure varies with density (d) as

A. $\sqrt{d}$

B. d^2

C. $\dfrac{1}{\sqrt{d}}$

D. $\dfrac{1}{d}$

Answer:

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12. At high pressure, the compressibility factor for one mole of van der waals gas will be

A. $1 + \dfrac{b}{R}T$

B. $1 - P\dfrac{b}{R}T$

C. $1 + P\dfrac{b}{R}T$

D. $1 + \dfrac{a}{VRT}$

Answer:

13. The correct thermodynamic conditions for the spontaneous reaction at all temperature is

    A. $\delta H > 0, \delta S < 0$

    B. $\delta H < 0, \delta S > 0$

    C. $\delta H > 0, \delta S > 0$

    D. $\delta H < 0, \delta S < 0$

Answer:

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14. A closed cylinder contains 40 g of SO_2, and 4 g of helium gas at 375 K. If the partial pressure of helium gas is 2.5 atm, then the volume of the container is $\left(R = 0.082L - atmK^{-1}mot^{-1}\right)$

A. 8.3L

B. 20L

C. 15.5L

D. 12.3L

Answer:

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15. In the electrolysis of H_2O, 11.2 liters of H_2 was liberated at cathode at NTP. How much O_2 will be liberated at anode under the same conditions.

A. 11.2 L

B. 22.4 L

C. 5.6 L

D. 3.6 L

Answer:

16. Which among the following will boil at highest temperature?

A. HCL

B. HF

C. Hl

D. HBr

Answer:

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17. If 200 ml of $0.1M H_2SO_4$ solution is mixed with 200 ml of 0.15 M NaOH solution then heat evolve during the neutralization process is

    A. 411 cal

    B. 548 cal

    C. 959 cal

    D. 822 cal

Answer:

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18. Unit of surface tension is

A. Nm^2

B. Nm^{-2}

C. Nm^{-1}

D. Nm

Answer:

19. For which of the following processes, entropy change is negative?

A. Evaporation of water

B. Sublimation of camphor

C. Condensation of Iodine vapours

D. Melting of ice

Answer:

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20. A liquid is in equilibrium with its vapour at a

certain temperature. If

$\Delta H_{vap} = 60.24 kJmol^{-1}$ and $\Delta S_{vap} = 150.6 Jmol^{-1}$

then the boiling point of the liquid will be

A. 275K

B. 375K

C. 350K

D. 400K

Answer:

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21. The work done by one mole of ideal gas when its teperature is increased by 1^oC at constant pressure is

A. $\dfrac{R}{2}$

B. 2R

C. R

D. 4R

Answer:

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22. Standard enthalpy of formation is zero for

A. Diamond

B. graphite

C. $Br^{-(aq)}$

D. $Cl_2(g)$

Answer:

23. Ratio of the rate of effusion of oxygen gas at 1.5 atm to that of helium gas at 4.5 atm will be

A. $1:6\sqrt{2}$

B. $1:12\sqrt{2}$

C. $1:2\sqrt{2}$

D. $1:3$

Answer:

24. Compressibility factor under critical state of a gas is

A. $\dfrac{5}{8}$

B. $\dfrac{8}{3}$

C. $\dfrac{3}{8R}$

D. $\dfrac{3}{8}$

Answer:

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25. An air bubble formed under water at temperature 17^oC and the pressure 1.8 atm started to move upwards and reaches the surface where temperature is 27^oC and pressure in 1 atm. The volume of the bubble at the surface will become

A. 2.32 times of the initial volume

B. 186 times of the initial volume

C. 0.5 times of the initial volume

D. 1.51 times of the initial volume

Answer:

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26. A gaseous mixture contains 220 g of carbon dioxide and 280 g of nitrogen gas. If the partial pressure of nitrogen gas in the mixture is 1.5 atm then the partial pressure of carbon dioxide gas in the mixture will be

A. 1.25 atm

B. 0.75 atm

C. 0.50 atm

D. 3 atm

Answer:

27. If the enthalpies of formation of $C_3H_8(g)$, $CO_2(g)$ and $H_2O(l)$ at standard conditions are $-104kJmol^{-1}$, $-394kJmol^{-1}$ and $-286kJmol^{-1}$ respectively then the standard Enthalpy of combustion of 66 g of $C_3H_8(g)$ will be

   A. $-2222KJ$

   B. $-2500KJ$

   C. $-784KJ$

   D. $-3333KJ$

Answer:

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28. When 5 moles of an ideal gas is expended at 350 K reversibly from 5 L to 40 L, then the entropy change for the process is (R = 2 cal $mol^{-1}K^{-1}$)

    A. $9.01 cal K^{-1}$

    B. $20.8 cal K^{-1}$

    C. $-15.2 cal K^{-1}$

    D. $22.3 cal K^{-1}$

Answer:

29. When 1.5 mol of a gas is heated at constant volume from 300 K to 350 K and the heat supplied to the gas is 750 J then the correct option is

A. q = δU = 750 J, w = 0

B. 9 = w = 750 J, δU = 0

C. q = w = 750 J, $\delta U = -750J$

D. q = 750 J, w = δU = -750 J

Answer:

30. For which of the following reactions, $\delta H = \delta U$?

A. $H_2(g) + l_2(g) \rightarrow 2Hl(g)$

B. $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$

C. $C(s) + H_2O(g) \rightarrow CO(g) + H_2(g)$

D. $CH_4(g) + H_2O(g) \rightarrow CO(g) + 3H_2(g)$

Answer:

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31. Select the state functions among the following.

(i) U + PV (ii) S

(iii) q (iv) w

H - TS

A. (iii), (v) and (v) only

B. (i) ,(ii) and (v) only

C. (iii) and (iv) only

D. (ii) ,(iii), (iv) and (v) only

Answer:

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32. The bond energies of H - H and I - I bonds are $435kJmol^{-1}$ and $150kJmol^{-1}$ respectively. If ΔH_f^o for HI is $26.5kJmol^{-1}$ then bond enthalpy of H-I bond is

A. 558.5 kJ/mo!

B. 266 kJ/mol

C. 611.5 kJ/mol

D. 293 kJ/mol

Answer:

33. The ratio of everage speed, most probable speed and root mean square speed of a gas sample will be

A. $\sqrt{\dfrac{4}{\pi}} : \sqrt{3} : \sqrt{2}$

B. `sqrt(8/pi):sqrt2:sqrt3

C. $\sqrt{\dfrac{16}{\pi}} : \sqrt{2} : \sqrt{3}$

D. $\sqrt{2} : \sqrt{\dfrac{9}{\pi}} : \sqrt{3}$

Answer:

34. If the energy absorbed by each X_2 molecule of a gas is 3.5×10^{-19} J and the bond energy of X_2 is $180.6 kJmol^{-1}$ then the kinetic energy per atom will be

A. $2.5 \times 10^{-19} J$

B. $5.0 \times 10^{-20} J$

C. $2.5 \times 10^{-20} J$

D. $1.5 \times 10^{-19} J$

Answer:

35. Ratio of everage kinetic energy of 14 g of N_2 at $27^o C$ to 24 g of O_2 at $227^o C$ is

A. 1:5

B. 2:5

C. 1:4

D. 3:5

Answer:

36. In vander waals gas equation, the term that accounts for the volume occupied by 'n' mole molecules is

A. $(V - nb)$

B. $\left(a\dfrac{n^2}{V^2}\right)$

C. nb

D. $P + \dfrac{an^2}{V^2}$

Answer:

37. The root mean square speed at NTP for the gases

CH_4, H_2, He and F_2 are in the order

   A. $CH_4 < H_2 < He < F_2$

   B. $H < He < CH_4 < F_2$

   C. $H_2 < He < F_2 < CH_4$

   D. $F_2 < CH_4 < He < H_2$

Answer:

38. At 127^oC, heat of fusion of a compound is 4.8kJ/mol. Entropy change for the process is

A. $37.8JK^{-1}mol^{-1}$

B. $15JK^{-1}mol^{-1}$

C. $18.6JK^{-1}mol^{-1}$

D. $12JK^{-1}mol^{-1}$

Answer:

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39. A gas expands in an insulated container against a constant external pressure of 1.5 atm from an initial

volume of 1.2 L to 4.2 L. The change in internal energy (ΔU) of gas is nearly (1 L-atm = 101.3 J)

A. -456J

B. +456J

C. -402J

D. +402J

Answer:

40. The enthalpy and entropy change for the reaction,

Br_2(l) + CI_2(g) $\rightarrow$ 2BrCl(g) are 7.1 kcal mol^{-1} and 25

cal $K^{-1}mol^{-1}$ respectively. This reaction will be spontaneous at

A. $10 degree C$

B. $280K$

C. 290K

D. -5degreeC

Answer:

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41. Heat of combustion of carbon monoxide is -283.5 kJ/mole. The heat released when 55 g of carbon dioxide

formed from carbon monoxide is

A. 283.5KJ

B. 324.2KJ

C. 354.4KJ

D. 385.5KJ

Answer:

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42. Ratio of the average speed of He and SO_2 at 27° C

will be

A. 4:1

B. 2:1

C. 8:1

D. 5:1

Answer:

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43. The gas which will be most easily liquefied is

A. He

B. O_2

C. NH_3

D. CO_2

Answer:

44. For effusion of equal volume, a gas takes twice the time as taken by methane under similar conditions. The molar mass of the gas is

A. 32 g/mol

B. 44 g/mol

C. 64 g/mol

D. 50 g/mol

Answer:

45. The density of O_2 gas at 127° C and 4.0 atm pressure is (R = 0.082 L atm $K^{-1}\,mol^{-1}$)

A. 4.2g/L

B. 3.9g/L

C. 2.4g/L

D. 1.5g/L

Answer:

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