<u>VGR COACHING CENTER</u> <u>CLASS XI</u> <u>CHEMISTRY</u>

<u>MARK-70</u>

<u>PART-A</u> 15×1=15

- 1. In an adiabatic process, which of the following is true ? q = w b) q = 0 c) $\Delta E = q d$) P $\Delta V = 0$
- 2. The intensive property among the quantities below is mass b) volume c) enthalpy d)mass/volume
- 3. Heat of combustion is always positive b) negative c) zero d) either positive or negative
- 4. The work done by the liberated gas when 55.85 g of iron (molar mass 55.85 g mol-1) reacts with hydrochloric acid in an open beaker at 250 C
 a) -2.48 kJ b) 2.22 kJ c) + 2.22 kJ d) + 2.48 kJ
- 5. Molar heat of vapourisation of a liquid is 4.8 kJ mol-1. If the entropy change is 16 J mol-1 K-1, the boiling point of the liquid is a) 323 K b) 270 C c) 164 K d) 0.3 K
- 6. The temperatures at which real gases obey the ideal gas laws over a wide range of pressure is called
 - a) Critical temperature b) Boyle temperature
 - b) Inversion temperature d) Reduced temperature
- 7. The value of universal gas constant depends upon
 - a) Temperature of the gas b) Volume of the gas
 - b) Number of moles of the gas d) units of Pressure and volume
- Use of hot air balloon in sports at meteorological observation is an application of
 Poyle's law b) Nowton's law c) Kelvin's law d) Prown's law

a)Boyle's law b) Newton's law c) Kelvin's law d) Brown's law

9. If temperature and volume of an ideal gas is increased to twice its values, the initial pressure P becomes
4P b) 2P c) P d) 3P

- 10.Compressibility factor for CO2 at 400 K and 71.0 bar is 0.8697. The molar volume of CO2 under these conditions is
 - a) 22.04 dm3 b) 2.24 dm3 c) 0.41 dm3 d) 19.5dm3
- 11.Carbon forms two oxides, namely carbon monoxide and carbon dioxide. The equivalent mass of which element remains constant?
 - (a) Carbon (b) oxygen (c) both carbon and oxygen (d) neither carbon nor oxygen
- 12. The equivalent mass of a trivalent metal element is 9 g eq-1 the molar mass of its anhydrous oxide is

(a) 102 g (b) 27 g (c) 270 g (d) 78

- 13.7.5 g of a gas occupies a volume of 5.6 litres at 0o C and 1 atm pressure. The gas is
 - (a) NO (b) N2O (c) CO (d) CO2
- 14. What is the mass of precipitate formed when 50 ml of 8.5 % solution of AgNO3 is mixed with 100 ml of 1.865 % potassium chloride solution?(a) 3.59 g (b) 7 g (c) 14 g (d) 28 g

15. The mass of a gas that occupies a volume of 612.5 ml at room temperature and pressure (250 c and 1 atm pressure) is 1.1g. The molar mass of the gas is(a) 66.25 g mol-1 (b) 44 g mol-1 (c) 24.5 g mol-1 d) 662.5 g mol-1

- PART-B WRITE ANY 7 Q.NO 20 IS COMPULSORY
 - 16.A balloon filled with air at room temperature and cooled to a much lower temperature can be used as a model for Charle's law
 - 17.Distinguish between diffusion and effusion.
 - 18. Why do astronauts have to wear protective suits when they are on the surface of moon?
 - 19. What are different methods used for liquefaction of gases:
 - 20.Explain the following observations
 - a) Aerated water bottles are kept under water during summer

- b) Liquid ammonia bottle is cooled before opening the seal
- 21.calculate the pressure exerted by 2 moles of sulphur hexafluoride\ in a steel vessel of volume 6 dm³ at 70 °C assuming it is an ideal gas.
- 22.Calculate the entropy change when 1 mole of ethanol is evaporated at 351 K. The molar heat of vaporisation of ethanol is 39.84 kJ mol-1
- 23.Predict the feasibility of a reaction when both ΔH and ΔS positive ii) both ΔH and ΔS negative iii) ΔH decreases but ΔS increases
- 24.Define the calorific value of food. What is the unit of calorific value?
- 25. The equilibrium constant of a reaction is 10, what will be the sign of ΔG ? Will this reaction be spontaneous?
- 26.Calculate the molar mass of the following compounds. urea $[CO(NH_2)_2]$
 - ii) acetone [CH₃COCH₃]

PART-C ANY 7 Q,NO 29 IS COMPULSORY

27. The balanced equation for a reaction is given below 2x+3y → 4l + m
When 8 moles of x react with 15 moles of y, then
Which is the limiting reagent?
ii) Calculate the amount of products formed.
iii) Calculate the amount of excess reactant left at the end of the reaction.

- 28. What is the difference between molecular mass and molar mass? Calculate the molecular mass and molar mass for carbon monoxide
- 29.It takes 192 sec for an unknown gas to diffuse through a porous wall and 84 sec for N_2 gas to effuse at the same temperature and pressure. What is the molar mass of the unknown gas?
- 30. What are ideal gases? In what way real gases differ from ideal gases
- 31.Explain pressure correction

- 32. The standard enthalpies of formation of C2H5OH(1), CO2(g) and H2O(1) are 277,-393.5 and -285.5 kJ mol-1 respectively. Calculate the standard enthalpy change for the reaction $C_2H_5OH(1)+3O_2(g)\Box 2CO_2(g)+3 H_2O(1)$
- 33. What is the criteria for spontancity of a process
- 34. Write any three characteristics of internal energy
- 35.Distinguidh between oxidation and reduction
- 36.Define the following terms:
 - a. isothermal process b. adiabatic process c. isobaric process
- 37.Derive the relation between ΔH and ΔU for an ideal gas. Explain each term involved in the equation.

OR

Calculate the work involved in expansion and compression process

38.a,State the various statements of second law of thermodynamics b.When a mole of magnesium bromide is prepared from 1 mole of magnesium and 1 mole of liquid bromine, 524 kJ of energy is released.The heat of sublimation of Mg metal is 148 kJ mol–1. The heat of dissociation of bromine gas into atoms is 193 kJ mol–1. The heat of vapourisation of liquid bromine is 31 kJ mol–1. The ionisation energy of magnesium is 2187 kJ mol–1 and the electron affinity of bromine is – 662 kJ mol–1. Calculate the lattice energy of magnesium bromide.

OR

Explain how heat absorbed at constant volume is measured using bomb calorimeter with a neat diagram.

39.Derive the values of van der Waals equation constants in terms of critical constants.

OR

a. State Boyle's law

b.A mixture of gases contains 4.76 mole of Ne, 0.74 mole of Ar and 2.5 mole of Xe. Calculate the partial pressure of gases, if the total pressure is 2 *atm*. at a fixed temperature.

40.a.Suggest why there is no hydrogen (H2) in our atmosphere. Why does the moon have no atmosphere?

b.Write any three characerstics of gibbs free energy

OR

Calculate the percentage composition of the elements present in magnesium carbonate. How many kilogram of CO2 can be obtained by heating 1 kg of 90 % pure magnesium carbonate

- 41.Experimental analysis of a compound containing the elements x,y,z on analysis gave the following data. x = 32 %, y = 24 %, z = 44 %. The relative number of atoms of x, y and z are 2, 1 and 0.5, respectively. (Molecular mass of the compound is 400 g) Find out.
 - I)The atomic masses of the element x,y,z.
 - ii) Empirical formula of the compound and
 - iii) Molecular formula of the compound.

OR

Balance the following equaton

 $\frac{\text{KMnO4} + \text{Na2SO3}}{\text{MnO2} + \text{Na2SO4} + \text{KOH}(\text{oxidation number})}$ method) $\frac{\text{KMnO4} + \text{SnC12} + \text{HC1}}{\text{MnC12} + \text{SnC14} + \text{H2O} + \text{KCl}(\text{ion electron})}$ method)

> PREPARED BY G.RAJA M.E ,.Ph.D VGR COACHING CENTER INJAMBAKKAM 8056141468,8939727230,8667090042