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Q.1 A compound which has all the three types of chemical bonds is:

- A) NH_4OH
- B) NaBH_4
- C) NH_4Cl
- D) All of these

Q.2 Which of the following molecule show maximum repulsion in its electron pairs?

- A) H_2S
- B) H_2O
- C) NH_3
- D) Both A & B

Q.3 All of the following are limitations of VSEPR theory EXCEPT:

- A) It does not give the reason for the formation of covalent bond
- B) It cannot explain the shapes of molecules having extensive delocalized pi electrons system
- C) It is not applicable for transition elements
- D) It predicts and explains the shape of molecules

Q.4 The shape of NH_2^- is:

- A) Linear
- B) Angular
- C) Pyramidal
- D) Tetrahedral

Q.5 Which of the following has maximum bond energy?

- A) $\text{C} - \text{C}$
- B) $\text{C} = \text{C}$
- C) $\text{C} \equiv \text{C}$
- D) $\text{C} = \text{O}$

Q.6 Ionic bond with greater ionic character is mostly formed between the elements of:

- A) IA and IIA
- B) IA and VIIA
- C) IA and VIA
- D) IIA and VIIA

Q.7 When water donates its electron pair to hydrogen ion to form hydronium ion, hybridization is changed from:

- A) sp^2 to sp^3
- B) sp^3 to sp
- C) sp^3 to sp^2
- D) Remains unchanged

Q.8 Which are the species in which central atom undergoes sp^3 hybridization?

- | | |
|-------------------|-------------|
| (i) $SnCl^4$ | (ii) NF^3 |
| (iii) BF_4^{1-} | (iv) H_2S |

- A) i and ii
- B) i, ii and iv
- C) i, ii, iii and iv
- D) i, iii and iv

Q.9 A state function which describes together the internal energy and product of pressure and volume is called

- A) Enthalpy
- B) Work
- C) Internal energy
- D) Kinetic energy

Q.10 Which of the following molecules has linear geometry?

- A) H_2O
- B) C_2H_2
- C) Cl_2O
- D) C_2H_4

Q.11 Chemical reactions that release energy to the surrounding are described as exothermic) In an exothermic reaction, the temperature of the surroundings increases. Which of the followings is not examples of exothermic reaction:

- A) The combustion of fuels
- B) Photosynthesis
- C) The oxidation of carbohydrates
- D) Reaction of sodium With water

Q.12 The enthalpy of formation of an ionic compound is -392 kJ/mol . Total energy change (ΔH .) involved in the formation of gaseous ions from normal physical state is 280 kJ/mol .

The enthalpy of lattice ($\Delta H_{\text{lattice}}$) is:

- A) -112 kJ/mol
- B) $+672 \text{ kJ/mol}$
- C) -672 kJ/mol
- D) $+224 \text{ kJ/mol}$

Q.13 Which one indicates enthalpy of atomization:

- A) $\text{K}_{(l)} \rightarrow \text{K}_{(g)}$
- B) $\text{K}_{(g)} \rightarrow \text{K}_{(s)}$
- C) $\text{K}^{-}_{(l)} \rightarrow \text{K}_{(g)}$
- D) $\text{K}_{(g)} \rightarrow \text{K}_{(g)}$

Q.14 Enthalpy change for exothermic and endothermic reactions is _____ and _____ respectively:

- A) Positive negative
- B) Negative, positive
- C) Positive, positive
- D) Negative, negative

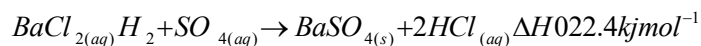
Q.15 Mark, the incorrect statement:

Options	Terms	Explanation
A)	System	Anything which is under observation
B)	Beaker	It is a System
C)	Surrounding	Environment of the system
D)	Boundary	The interface (real or imaginary) which separates system and surrounding)

Q.16 Which is incorrect about the state function:

- A) It has definite initial value of state
- B) It has definite final value of state
- C) It depends upon the path followed by the system
- D) It is macroscopic property

Q.17 The heat change represented by given equation is called:



- A) Heat of formation
- B) Heat of dissociation
- C) Heat of reaction
- D) All of these

Q.18 First law of thermodynamics may be denoted under various conditions as:

- A) $\Delta H = \Delta E$ if $\Delta n = 0$
- B) $\Delta E = q_v$ if $\Delta V = 0$
- C) $\Delta H = q_p$ if $P = 0$
- D) All are correct

Q.19 Which equation shows lattice energy for ionic compound:

- A) $Na_{(s)} + \frac{1}{2}Cl_{2(g)} \rightarrow NaCl_{(s)}$
- B) $Na_{(aq)} + Cl_{aq} \rightarrow NaCl_{(aq)}$
- C) $Na_{(s)} + Cl_{2(g)} \rightarrow NaCl_{(s)}$
- D) $Na_{(g)} + Cl_{(g)} \rightarrow NaCl_{(s)}$

Q.20 In NH_3 , the covalent bonds are formed due to:

- A) s-sp overlap
- B) s-sp² overlap
- C) s-sp³ overlap
- D) None

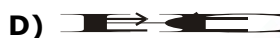
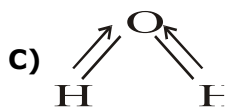
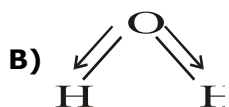
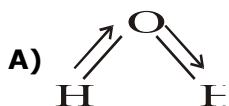
Q.21 Ionic compounds do not show the phenomenon of isomerism because bond are:

- A) Direction and rigid
- B) Non-directional and rigid
- C) Non-directional and non-rigid
- D) All above

Q.22 Which of the following has greater ionic characters in it?

- A) HF
- B) HCl
- C) H₂O
- D) H₂

Q.23 Which directions of dipole moments are correct for water molecule?



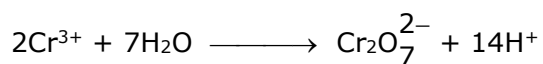
Q.24 A piece of copper is dipped in colorless silver nitrate aqueous solution. The colorless solution becomes blue due to:

- A) Formation of silver copper alloy
- B) Reduction of copper
- C) Oxidation of copper
- D) Oxidation of silver

Q.25 In potassium manganate the oxidation number of manganese is:

- A) +2**
- B) +4**
- C) +6**
- D) +7**

Q.26 How many electrons are required to balance the charge in the following equation:



- A) 9e^- on right side**
- B) 9e^- on left side**
- C) 6e^- on the right side**
- D) 6e^- on the left side**

Q.27 Which one of the following can have positive and negative oxidation state in various compound?

- A) Fluorine**
- B) Sodium**
- C) Iodine**
- D) Helium**

Q.28 In which of the following cells, electric current is used to bring about a chemical reaction?

- A) Electrolytic cell**
- B) Galvanic cell**
- C) Daniel cell**
- D) All of the above**

Q.29 Which of the following is the function of salt bridge-(u-shaped tube filled with KCl in gelatin)?

- A)** It allows electric current between two solution
- B)** It prevents mixing of the electrode solution
- C)** It maintains electrical neutrality in each half cell
- D)** All of the above

Q.30 In a galvanic cell the electrode occupying a higher position in the electrochemical series acts as:

- A)** Anode
- B)** Cathode
- C)** Both
- D)** Inert

Q.31 When the oxidation and reduction half reactions are added, the sum of the electrons is:

- A)** Positive
- B)** Negative
- C)** Zero
- D)** fraction

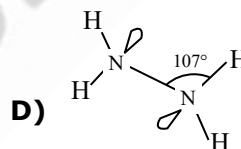
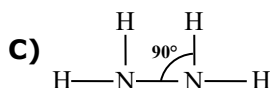
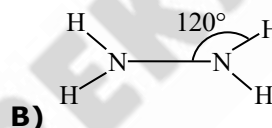
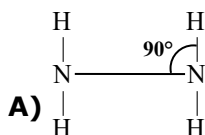
Q.32 The bond angle of carbon number 2 in 1,3-Butadiene

- A)** 90°
- B)** 109°
- C)** 120°
- D)** 180°

Q.33 What is the pattern of electron pairs in CN^- ion

	Bonding pairs of electrons	Lone pairs on carbon atom	Lone pairs on nitrogen atom
A)	2	1	1
B)	2	2	1
C)	3	1	1
D)	3	1	2

Q.34 Which is the most likely shape of a molecule of hydrazine, N_2H_4



Q.35 Which of the following molecules has zero dipole moment

- A)** C_2Cl_4
- B)** CCl_2F_2
- C)** CHCl_3
- D)** $\text{C}_2\text{H}_5\text{Cl}$

Q.36 Thermodynamics does NOT deal with

- A)** Heat of reaction
- B)** Spontaneity of reaction
- C)** Rate of reaction
- D)** Entropy of reaction

Q.37 If an endothermic reaction is allowed to take place very rapidly in air, the temperature of the surrounding air will

- A)** Remains constant
- B)** Increase
- C)** Decrease
- D)** Either increase or decrease

Q.38 The exothermic process is

- A)** Evaporation
- B)** Sublimation
- C)** Respiration
- D)** Boiling

Q.39 A process, which takes place on its own without any outside assistance, is termed as

- A)** Isothermal process
- B)** Spontaneous
- C)** Non-spontaneous
- D)** Adiabatic process

Q.40 The work done by expansion of gas against constant pressure is

- A)** $P\Delta V$
- B)** $- P\Delta V$
- C)** PV
- D)** ΔPV