Maximum Marks: 10 **(OBJECTIVE TYPE)** Time Allowed: 10 Min.

NOTE: Tick The Correct Option:

1) The change in heat energy of a chemical reaction at constant temperature and pressure is called:
   (a) Enthalpy change
   (b) Heat of sublimation
   (c) Bond energy
   (d) Internal energy change

2) For the reaction: $NaOH + HCl \longrightarrow NaCl + H_2O$ the change in enthalpy is called:
   (a) Heat of reaction
   (b) Heat of formation
   (c) Heat of neutralization
   (d) Heat of combustion

3) Standard enthalpies are measured at:
   (a) 273 K
   (b) 298 K
   (c) 373 K
   (d) All

4) Which is a state function?
   (a) Temperature
   (b) Heat
   (c) Work
   (d) All

5) Potential energy accounts for the:
   (a) Motion of the particles
   (b) Collisions between the particles
   (c) Attraction between the particles
   (d) Reaction between the particles

6) When work is done by the system on the surroundings, then 'W' takes _____ sign.
   (a) Positive
   (b) Negative
   (c) No
   (d) Any

7) Which one is always exothermic?
   (a) ΔH^o_f
   (b) ΔH^o_{at}
   (c) ΔH^o_c
   (d) ΔH^o_{sol}

8) The amount of heat required to raise the temperature of a system by 1^oC or 1K is called:
   (a) Specific heat
   (b) Heat capacity
   (c) Molar specific heat
   (d) All

9) According to Hess's law of constant heat summation, the overall enthalpy change in a cyclic process is:
   (a) Zero
   (b) Unity
   (c) Constant
   (d) All

10) Born-Haber cycle helps us to calculate the _____ of binary ionic compounds.
    (a) Bond energies
    (b) Hydration energies
    (c) Lattice energies
    (d) Formation enthalpies

Maximum Marks: 20 **(SUBJECTIVE TYPE)** Time Allowed: 40 Min.

SECTION-I

Q.2: Give brief answers to the following questions: (12)

i. Define boundary of the system.
ii. What are the ways of transferring energy between the system and the surroundings?
iii. What is the mathematical relationship between heat and temperature?
iv. Define enthalpy.
v. Define standard enthalpy of formation.
vi. Why can the enthalpy of formation of Al_2O_3/B_2O_3 not be measured directly?

SECTION-II

NOTE: Attempt All Questions: (08)

Q.3: What is first law of thermodynamics? Prove that $\Delta E = q_v$.

Q.4: Describe the measurement of enthalpy of reaction by bomb calorimeter.