

Physics Grade 10 Calorimetry Assignment

Q1. Define:

- (a) Heat
- (b) Temperature
- (c) One calorie
- (d) Thermal capacity
- (e) Specific heat capacity
- (f) Melting point
- (g) Boiling point
- (h) Specific latent heat of fusion
- (i) Specific latent heat of vaporization

Q2. Give reasons for the following:

- (a) Places near the sea have a moderate climate
- (b) Farmers fill their fields with water to protect the crops from frost
- (c) A calorimeter is made of thin sheet copper
- (d) The base of an electric iron is made thick and heavy
- (e) Pressure cooker is used for cooking at high altitude
- (f) Snow on mountain does not melt all at once
- (g) When ice in a frozen lake starts melting, its surrounding becomes very cold
- (h) Drinks get cooled more quickly by adding pieces of ice at 0°C than ice-cold water at 0°C
- (i) It is generally colder after a hail storm (when ice melts) than during or before the hail storm
- (j) In a central heating system, steam enters a radiator pipe at 100°C and water leaves the radiator pipe at 100°C , even then the radiator pipe heats the room
- (k) The heat supplied to a substance during its change of state, does not cause any rise in its temperature.
- (l) By adding salt to ice we can prepare ice cream in a few minutes

Q3. A piece of iron of mass 2kg has a thermal capacity of 996J/C. Find:

- (a) Heat energy needed to warm it by 15°C
- (b) Its specific heat capacity in SI units

Q4. 45g of water at 50°C in a beaker is cooled when 50g of copper at 18°C is added to it. The contents are stirred till a final constant temperature is reached. Calculate this final temperature. (The specific heat capacity of copper is 0.39J/gK and that of water is 4.2 J/gK). State the assumption used.

Q5. Some hot water was added to three times its mass of cold water at 10°C and the resultant temperature was found to be 20°C . What was the temperature of the hot water?

Q6. Calculate the amount of heat released when 5g of water at 20°C is changed into ice at 0°C. (Specific heat capacity of water=4.2J/g°C, specific latent heat of fusion of ice=4200J/kg°C).

Q7. 1 kg of ice at 0°C is being continuously heated through an electric heater rated at 1kW. Assuming that all the heat energy is transmitted to ice, calculate the time interval in seconds for:

- (a) Ice to completely melt at 0°C
- (b) Water to get heated from 0°C to 100°C (Specific latent heat of ice=336000J/kg and Specific heat capacity of water=4200J/kg°C)

Q8. A piece of ice at -10°C is heated at a constant rate. The variation of temperature with heat input is shown in the graph below:

- (a) What are represented by AB, CD?
- (b) What conclusion do you draw regarding the nature of ice?

Q9. The graph represents a cooling curve for a substance being cooled from higher temperature to lower temperature.

- (a) What is the boiling point of the substance?
- (b) What happens in the region DE?
- (c) Why is the region DE shorter than the region BC?