

ASSIGNMENT - 2 PROPERTIES OF STEAM

Q-1

Evaluate the condition of the steam (i.e., wet, dry saturated or superheated) for the following cases

- (a) Steam at 15 bar pressure and specific volume is $0.12 \text{ m}^3/\text{kg}$.
- (b) Steam at 10 bar pressure and 200°C temperature.
- (c) Steam at 20 bar and having specific enthalpy 2650 kJ/kg .
- (d) Steam at temperature of 150°C and specific volume $0.3928 \text{ m}^3/\text{kg}$.

Q-2

Calculate the external work done during evaporation, internal energy of steam, and internal heat of evaporation for steam at 10 bar pressure and dryness = 0.8,

Q-3

1.5 kg of steam at a pressure of 10 bar and temperature of 250°C is expanded until the pressure becomes 2.8 bar. The dryness fraction x of steam is then 0.9. Calculate change in internal energy.

Q-4

Combined separating and throttling calorimeter is used to find dryness fraction of steam.

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Following readings were taken :

Main pressure = 12 bar

Mass of water collected in separating calorimeter = 2 kg

Mass of steam condensed in throttling calorimeter = 20 kg

Temperature of steam after throttling = 110°C

Pressure of steam after throttling = 1 bar Assume c_p of steam = 2.1 kJ/kg K

Calculate dryness fraction of steam.

Q-5

: Determine the mass of 0.15 m^3 of wet steam at a pressure of 4 bar and dryness fraction 0.8. Also calculate the heat of 1 m^3 of steam.

Q-6

Determine the enthalpy and internal energy of 1 kg of steam at a pressure 10 bar(abs.), (i) when the dryness fraction of the steam is 0.85 (ii) when the steam is dry and saturated (iii) when the steam is superheated to 300°C . Neglect the volume of water and take c_p as 2.1 kJ/kgK .

Q-7

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Determine the enthalpy and internal energy of 1 kg of steam at a pressure 10 bar(abs.), (i) when the dryness fraction of the steam is 0.85 (ii) when the steam is dry and saturated (iii) when the steam is superheated to 300°C. Neglect the volume of water and take p as 2.1 kJ/kgK.