St. Michael Polytechnic College

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DEPT: MECHANICAL **YEAR/SEMESTER**: III / V
SUB.NAME: **THERMAL ENGINEERING-II**

Each question carries 1(one) mark in PART-A and 12(twelve) marks in PART-B

UNIT-1 FORMATION AND PROPERTIES OF STEAM & THERMODYNAMIC PROCESS OF VAPOUR

PART –A

1. Define sensible heat .
2. What is mean by degree of super heat?
3. What is the condition of steam?
4. Define dryness fraction.
5. Define density of steam.
6. What is mean by triple point?
7. What are applications of throttling process?
8. What is dry steam?
9. What is meant by enthalpy of super heats steam?
10. Define entropy of steam.
11. What are the types of calorimeter?
12. What is the use of steam calorimeter?
13. What are the advantages of super heats steam?
14. What is enthalpy of wet steam?
15. P.V diagram and T.S diagram.
16. Define entropy of steam?

PART –B

1. Find the total heat required to produce 3kg of steam at a pressure at 7bar & temperature at 200^0c from water at 25^0c .Take specific heat at super heats steam at as 2.09KJ/kg k.
2. Find the entropy at 2kg of steam at a pressure at 10bar when the steam is dry saturated, when the steam 0.75 dry and when the steam is super heated to 200^0c assume Cp=2.09 KJ/kg k.

3. Steam at 20bar and 300^0c passes through a pipe at the velocity at 120m/s. if the steam flows at the rate of 500 kg/hr. find the diameter?
4. Steam at pressure at 8.5bar absolute and dryness fraction at 0.98 is subjected to throttling expansion of 1bar. Find the final condition of a steam .Assume Cp for super heats steam as 2.25 KJ/kg k.
5. In a test to find the dryness fraction of steam with combined separately and throttling calorimeter the following observation were record. Water collected in separating calorimeter =4.5 kg steam condensed. After throttling calorimeter 45.5kg. Initial pressure of steam =11.5bar (Abs) temperature of steel after throttling =140^oc manometer reading=98mm of Hg barometer reading=752mm of Hg. Estimate the dryness fraction of steam as it enters the calorimeter. Also determine the dryness fraction of steam before throttling. For super heats steam Cp=2.09 KJ/kg K.
6. In a separately and throttling calorie meter the steam pressure is 8.3 bar absolute and the temperature after throttling is 130^0c.The pressure in the throttling calorie meter is 0.01 bar gauge. The barometer reading is 75 cm of hg at the separator. 0.15 kg of water is trapped and 1.8kg of steam passed through the throttling calorimeter. Determine the dryness fraction of steam m in steam main.