9. Write about :

(a) Laminar film condensation on a vertical plate. 10

(b) Heat transfer with change of phase. 10

Roll No. .....

24356

B. Tech. 6th Semester (ME)

Examination – May, 2019

HEAT TRANSFER

Paper : ME- 306-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Section. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. Write notes on : $5 \times 4 = 20$

(a) Heat Transfer with suitable examples.

(b) Fin Effectiveness.

(c) Stephen- Boltzmann Law.

(d) Boiling Regimes.

SECTION – A

2. Write about :

(a) Combined Heat Transfer System. 10

(b) Law of Energy Conservation. 10

3. Explain Cartesian Coordinate System for heat conduction. 20

SECTION – B

4. Two rods A and B of the same length and diameter protrude from a surface at 120°C and are exposed to air at 25°C. The temperatures measured at the end of the rods are 50°C and 75°C. If thermal conductivity of material A is 20 W/m-deg, calculate the thermal conductivity of material B. Adopt the condition of a fin insulated at the tip. 20

5. Write about :

(a) Transient Heat Conduction. 10

(b) Relaxation Method. 10

SECTION – C

6. Discuss about :

(a) Momentum Equations. 10

(b) Fluid Friction and Heat Transfer. 10

7. Discuss about :

(a) Shape factors and their relationships. 10

(b) Black body radiation. 10

SECTION – D

8. Exhaust gases ($C_p = 1.12\ kJ/Kg$ -- deg) flowing through a tubular heat exchanger at the rate of 1200 kg/ hr are cooled from 400°C to 120°C. The cooling is affected by water ($C_p = 4.18 kJ/Kg\ K$) that enters the system at 10°C at the rate of 1500 kg/ hr. If the overall heat transfer coefficient is 500 kJ/m^2-hr-deg. What heat exchanger area is required to handle the load for :

(a) Parallel flow, and

(b) Counter flow arrangement ? 20