

Roll No.

24356

B. Tech. 6th Semester (ME)

Examination – May, 2016

HEAT TRANSFER

Paper : ME-306-F

Time : Three Hours] [Maximum Marks : 100

Before answering the question, 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 : There are **nine** questions in total. Question No. 1 is **compulsory**. Students have to attempt **five** questions in total selecting atleast **one** question from each part Section.

1. (a) Explain heat transfer with suitable examples.
- (b) Define temperature, reversible and irreversible processes.
- (c) Explain equation of continuity .
- (d) Explain black body. $4 \times 5 = 20$

SECTION - A

2. (a) Explain different modes of heat transfer with suitable. 10
(b) State and explain law of conservation of energy. 10
3. Explain Cartesian co-ordinate system for heat conduction. 20

SECTION - B

4. A steel rod ($K=30\text{ W/m-deg}$) 1cm in diameter and 5cm long protrudes from a wall which is maintained at 100°C . The rod is insulated at its tip and is exposed to an environment with $h = 50\text{ W/m}^2\text{-deg}$ and $t_a = 30^\circ\text{C}$. Calculate fin efficiency, temperature at tip and rate of heat dissipation. 20

5. Explain transient heat conduction in plane wall. 20

SECTION - C

6. Derive and explain momentum and energy equation. 20

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24356-12,700-(P-3)(Q-9) (16) (3)

7. Explain Stephen Boltzman law and also explain shape factor and their relationship. 20

SECTION - D

8. Explain parallel and counterflow heat exchanger and also calculate their effectiveness. 20

9. Explain :

- (a) Nucleate and film boiling. 10
(b) Boiling regimes. 10