

24836

**B. Tech. 6th Semester (Fire Tech. & Safety) F. Scheme  
Examination, May – 2017**

**HEAT TRANSFER COMBUSTION AND  
EXPLOSIVES**

**Paper–FT-312-F**

*Time allowed : 3 hours ]*

*[Maximum marks : 100*

*Note : Attempt any five questions in all. Question number one is compulsory and selecting at least one question from each section. Assume suitable data whenever required.*

1. (a) What is thermal conductivity ? Explain the effect of temperature on it in brief. (5)
- (b) Write the Fourier rate equation for heat transfer by conduction. (5)
- (c) What is the difference between Natural and Forced convection ? Explain in brief. (5)
- (d) Write short note on modes of Boiling. (5)

**Section–A**

2. Derive a General Expression for Heat Transfer in Cylindrical (Polar) Co-ordinates. State the assumptions made. (20)
3. What is overall heat transfer coefficient ? Explain the procedure of applying Electrical Analogy to heat transfer problem having resistance in series. (20)

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**Section-B**

4. What are the various types of fins ? Explain temperature distribution and heat transfer in fins in case of infinitely long fin and short fins. (20)
5. What is transient heat conduction ? Explain rate of cooling and heat transfer in quenching of billet by Lumped heat capacity method. (20)

**Section-C**

6. Explain the equation of conductivity in hydro-dynamic boundary layers. (20)
7. What is dimensional analysis ? Explain the physical significance of dimensional numbers, (20)

**Section-D**

8. Explain the following :
  - (i) Pool Boiling and Condensation Heat Transfer.
  - (ii) Film Condensation Drop wise condensation ?(20)
9. What is Parallel-Flow Heat Exchange ? Derive an Expression for Effectiveness in case of a counter flow heat exchanger. (20)