Seat No: _____ **Enrollment No: _____**

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

M.Tech. Summer 2018 - 19 Examination

Semester: 2 **Date: 06/05/2019**
Subject Code: 203210152 **Time: 10:30am to 1:00pm**
Subject Name: Advanced Heat transfer **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 **A) Define the following** :

(i) Nusselt number.
(ii) Reynold's number.
(iii) Prandlt number.
(iv) Peclet number.
(v) Grashof number. **(05)**

B) Explain following laws relating to thermal radiation and temperature of a radiating body: Planck's law, Stefan Boltzman law and Wien's displacement law. **(05)**

C) Define and shows expression of (i) Efficiency of fin (ii) Effectiveness of fin, also state the Factors affecting fin effectiveness **(05)**

Q.2 **Answer the following questions**. (Attempt any three) (Each five mark) **(15)**

A) A small blackbody has a total emissive power of $5kW/m^3$. Analyze the surface temperature and the wavelength of maximum emission. In which range of the spectrum does this wavelength fall?

B) Define initial and boundary conditions? Summarize the different types of boundary conditions applied to heat conduction problems.

C) State applications to Heat Transfer. Describe the modes of heat transfer.

D) Explain thermal boundary layer theory with neat sketch.

Q.3 A) State the lumped system analysis? Compute the equation for lumped parameter Analysis. **(07)**

B) Evaluate the expression for temperature distribution and heat dissipation in a straight fin of rectangular profile for Infinitely long fin. **(08)**

OR

B) Illustrate the hottel's Crossed-Strings Method. **(08)**

Q.4 A) Describes Von-Karman's expression for convective heat transfer. **(07)**

OR

A) Compute an equation of two dimensional conduction in a thin rectangular plate. **(07)**

B) Explain general heat conduction equation in a Large Plane Wall. **(08)**