**SIR ISSAC NEWTON COLLEGE OF ENGINEERNG AND TECHNOLOGY**

**PAPPAKOIL, NAGAPATTINAM**

**DEPARTMENT OF MECHANICAL ENGINEERING**

**model EXAM**

**SUB CODE/NAME:** ME6502 HEAT AND MASS TRANSFER **DATE: 08-09-18 SEM/YEAR: III / V TIME DURATION** : 1.30 Hrs

**PART A (5×2=10)**

1. What is meant by Fouling factor?

2. What is meant by pool boiling?

3. What are black body and gray body?

4. State Stefan – Boltzmann law.

5. Define Emissivity.

**PART B (4×10=40)**

11 a). Water is boiled at the rate of 24 kg/h in a polished copper pan, 300 mm in diameter, at atmospheric pressure. Assuming nucleate boiling conditions calculate the temperature of the bottom surface of the pan.

11 b). Hot oil with a capacity rate of 2500 W/K flows through a double pipe heat exchanger. It enters at 360 °C and leaves at 300 °C. Cold fluid enters at 30 °C and leaves at 200 °C. If the overall heat transfer coefficient is 800 W/m2K, determine the heat exchanger area required for 1) parallel flow and

2) Counter flow.

8. Two black square plates of size 2 by 2 m are placed parallel to each other at a distance of 0.5 m. One plate is maintained at a temperature of 1000C and the other at 500C. Find the heat exchange between the plates.

9. A thin 100 cm long and 10 cm wide horizontal plate is maintained at a uniform temperature of 150C in a large tank full of water at 75C. Estimate the rate of heat to be supplied to the plate to maintain constant plate temperature as heat is dissipated from either side of plate.

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NOTE:

* Write the answers with Units (if not 3 marks will be deducted)
* Write the question number outside of margin (if not 2 marks will be deducted)
* Put box for answers
* Solve the problem by following mode 1.Given data 2.To find 3.Solution 4.Results