

School of University Polytechnic**Diploma in Mechanical Engineering
Semester End Examination - Jun 2024****Duration : 180 Minutes
Max Marks : 100****Sem IV - N1DL405C- N1DL401C - DPME2009 - Concept of Heat Transfer***General Instructions**Answer to the specific question asked**Draw neat, labelled diagrams wherever necessary**Approved data hand books are allowed subject to verification by the Invigilator*

- 1) Define Reynold's Number. K1(2)
- 2) Compare conduction and convection. K2(4)
- 3) Explain the concept of overall heat transfer coefficient with an electrical analogy. K2(6)
- 4) Consider a metal rod of length 'L,' cross-sectional area 'A,' and thermal conductivity 'k.' If one end of the rod is maintained at a temperature 'T1' and the other end at 'T2,' derive the equation for steady-state heat conduction through the rod. Show all relevant steps in your derivation. K3(9)
- 5) Describe free convection from a vertical flat plate with a suitable example. K3(9)
- 6) State how can absorptivity of an opaque body be improved? K5(10)
- 7) Differentiate the black body, gray body and opaque body. K4(12)
- 8) Translate and outline the fundamental principles of the black body concept and emissive power into practical engineering applications. K5(15)
- 9) Determine and estimate the influence of fouling on the overall performance of a heat exchanger, considering the fouling resistance, reduction in heat transfer coefficient. K5(15)
- 10) In what medium is the lumped system analysis more likely to be applicable: in water or air? Explain. K6(18)