

Master of Technology
Third Semester Main Examination, Dec-2020
Computer Aided Design of Thermal System [MTTPE301(1)]

Time: 3:00 Hrs**Max Marks 70****Note : Attempt any five questions. All questions carry equal marks.**

- Q.1 (a) Explain the formulation of design problem of a thermal system.
 (b) Discuss the conceptual design step in design of hot rolling process.
- Q.2 (a) Discuss the importance of material selection in design of thermal system.
 (b) In a food processing system, food materials are placed on flat plate and subjected to gas heating at the bottom of plate for a given amount of time. Select a suitable material for the plates.
- Q.3 (a) What do you understand by mathematical modeling? Compare it with physical modeling.
 (b) Write For a common parallel flow heat exchanger discuss the development of a simple mathematical model.
- Q.4 (a) What do you understand by simulation of thermal process? State its importance. Discuss any simulation software available in design of thermal system.
 (b) What is Numerical simulation? Discuss different methods of numerical simulation.
- Q.5 (a) Describe calculus method of optimization.
 (b) What is Dynamic programming? State its limitation.
- Q.6 In a water flow problem, the total flow rate is given by two variable x and y.
 Flow rate = $8.5x + 7.1y^2 + 21$ with a constraint that $x + y \leq 25$. Solve the optimization problem as a constrained problem.
- Q.7 (a) Explain in brief genetic algorithm.
 (b) Explain computer aided design material selection.
- Q.8 What is the maximum rate of heat transfer possible in a counter flow heat exchanger show below if the water enter at 30° and cools oil entering at 60°C .

Master of Technology
Third Semester Main Examination, Dec-2020
Non-Conventional Energy Sources [MTTPE302(2)]

Time: 3:00 Hrs**Max Marks 70****Note : (i) Attempt any five questions out of seven.
(ii) All questions carry equal marks.**

- Q.1. (a) What is solar time and why it different from the standard clock time of a country.
 (b) What do you understand by green power?

- Q.2. (a) Write a detailed note on world's production and reserves of commercial energy sources.
(b) Write a detailed note on thermal energy storage systems.
- Q.3. (a) Explain the methods of energy conversion from hydropower plant.
(b) Explain geothermal energy?
- Q.4. (a) With a neat sketch, explain the working of CANDU reactor.
(b) Write a short note on radioactivity hazards.
- Q.5. (a) Write a note M.H.D. generator.
(b) Describe the classification of fuel cells. Explain the principle of operation of an alkaline fuel cell.
- Q.6. (a) Describe the classification of fuel cells. Explain the principle of operation of an alkaline fuel cell.
(b) Write a note on Michaelis-menten equation.
- Q.7. Write short notes on:
(a) Describe the methods of power generation by wind mill.
(b) Explain the Wind power plant with diagram.