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Fifth Semester B.E. Degree Examination, June/July 2016

Energy Engineering

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FIVE full questions, selecting at least TWO questions from each part.

2. Use of Steam table with Molier chart permitted.

PART – A

- 1
 - a. Explain with a neat sketch, working of multiretort stocker and their advantages. (10 Marks)
 - b. Explain pneumatic or vacuum extraction ash handling system. (06 Marks)
 - c. What are the advantages of liquid fuels used in thermal power plants? (04 Marks)
- 2
 - a. With a neat sketch, explain the working of Schmidt – Hartman Boiler. (08 Marks)
 - b. What are the different types of cooling ponds and cooling towers? (08 Marks)
 - c. Explain the comparisons between forced and induced draughts. (04 Marks)
- 3
 - a. Classify the fuel storage and supply systems used in a diesel power plant. (08 Marks)
 - b. With a neat diagram, explain the working of a diesel power plant. (08 Marks)
 - c. What are the outstanding features of a diesel power plant over thermal power plant? (04 Marks)
- 4
 - a. Explain water hammer and surge tanks. What are the different types of surge tanks? Brief with neat sketches. (08 Marks)
 - b. Define the term Hydrograph and Unit Hydrographs. (06 Marks)
 - c. A catchment area of the dam used for hydroelectric station is 250 km². The annual rainfall is 125cm. If 70% of water is used for power generation in the dam, calculate the capacity of power plant in MW. Assume that the turbine efficiency is 90% and generator efficiency is 95%. Neglect the losses. (06 Marks)

PART – B

- 5
 - a. With a neat sketch, explain the working of a fast breeder reactor and write the advantages and disadvantages. (08 Marks)
 - b. What are the general components of nuclear reactor? (08 Marks)
 - c. Explain the terms Nuclear Fusion and Nuclear Fission reaction. (04 Marks)
- 6
 - a. What is Flat Plate Collector? Write a brief description of Liquid collector. (08 Marks)
 - b. Write with a neat sketch, the working of a Horizontal axial machines. (08 Marks)
 - c. Derive an expression for overall conversion efficiency and coefficient of performance in terms of velocity of blade element. (04 Marks)
- 7
 - a. What are the components of a tidal power plant? Brief each. (08 Marks)
 - b. A hot water geothermal plant of the total flow type receives water at 225°C. The pressure at the turbine inlet is 10.5 kg/cm². The plant uses a direct contact condenser that operates at 0.35 kg/cm². The turbine has a polytrophic efficiency of 0.65 for a cycle net output of 10MW. Calculate by using steam table and Molier chart.
 - (i) The hot water flow in kg/hr.
 - (ii) The condenser cooling water flow in kg/hr at water temperature at 27°C.
 - (iii) The cycle efficiency.
 - (iv) The plant heat rate. (08 Marks)
 - c. Write the advantages and disadvantages of tidal power generation. (04 Marks)
- 8
 - a. Explain photosynthesis with example. (08 Marks)
 - b. With a neat diagram, explain the working of continuous and batch type Biogas plants. (08 Marks)
 - c. Write the classification of Biomass gasifiers. (04 Marks)
