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10ME53

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 atleast 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 km^2. 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 breader 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/cm^2. The plant uses a direct contact condenser that operates at 0.35 kg/cm^2. The turbine has a polytrophic efficiency of 0.65 for a cycle net output of 10MW. Calculate by using stream 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)**

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