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10ME53

Fifth Semester B.E. Degree Examination, Dec.2013 / Jan. 2014
Energy Engineering

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART - A

- 1 a. Sketch and explain traveling grate stoker. (07 Marks)
 b. Write the advantages and disadvantages of using pulverized coal in thermal power plants. (05 Marks)
 c. Explain hydraulic ash handling system, with a neat sketch. (08 Marks)
- 2 a. Sketch and explain Benson boiler. (07 Marks)
 b. Define draught and explain forced draught, with a neat sketch. (06 Marks)
 c. Define cooling tower and explain hyperbolic cooling tower, with a neat sketch. (07 Marks)
- 3 a. Draw the layout of diesel power plant and explain its operation. (07 Marks)
 b. Explain thermo Syphon cooling with a neat sketch. (07 Marks)
 c. Explain different starting methods for diesel engine. (06 Marks)
- 4 a. Draw the general layout of hydel power plant. (04 Marks)
 b. Differentiate the following with reference to hydel power plant :
 i) Pondage and storage ii) Base load and peak load plants. (06 Marks)
 c. The discharge through a monsoon stream are tabulated below :

Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Discharge m ³ /s	2.0	1.5	1.0	0.6	0.0	0.0	8.0	10.0	12.0	6.0	4.0	3.0

- i) Draw the hydrograph and calculate the average flow.
- ii) Determine the capacity of the reservoir for the obtained average flow if a dam is constructed across the stream.
- iii) If the mean level of water on the upstream side is 100m above the tail race, find the power in kW that could be generated assuming 80% generator efficiency. (10 Marks)

PART - B

- 5 a. Define nuclear reactor. Sketch and explain nuclear reactor. (08 Marks)
 b. Explain boiling water reactor with a neat sketch. (06 Marks)
 c. Write a note on : i) Radiation hazards and ii) Radioactive waste disposal. (06 Marks)
- 6 a. Explain one typical method of harnessing energy from the given below natural sources with a neat sketch : i) Solar energy ii) Wind energy. (14 Marks)
 b. Write the advantages and disadvantages of non - conventional energy conversions. (06 Marks)
- 7 a. Explain the principle of harnessing energy from the following sources of energy, with a neat sketch : i) Tidal energy ii) Ocean thermal energy and iii) Geothermal energy. (15 Marks)
 b. Explain the principle by which tides are formed. (05 Marks)
- 8 a. Explain the factors affecting biogas generation. (04 Marks)
 b. Explain the principle by which biogas is produced, with a neat sketch. (10 Marks)
 c. Explain i) Anaerobic fermentation ii) Photo synthesis. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42-8 - 50, will be treated as malpractice.