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06ME54

Fifth Semester B.E. Degree Examination, December 2012
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 overfeed and underfeed principle of firing coal. **(06 Marks)**

b. Explain with a neat diagram, of a cyclone furnace. State its important merit and limitation. **(08 Marks)**

c. List the ash handling equipments. With a neat sketch explain any one ash handling equipment. **(06 Marks)**

2 a. Draw a neat diagram of Benson and Velox boiler and explain its working. Discuss its relative merits and demerits. **(12 Marks)**

b. With a neat sketch, briefly explain air preheater and superheaters in thermal power plant. **(08 Marks)**

3 a. Draw a line diagram to show the layout of diesel power plant and explain. **(10 Marks)**

b. Briefly explain important applications of diesel engines in power field. **(05 Marks)**

c. Sketch and explain air exhaust system. What care is taken while designing exhaust system? **(05 Marks)**

4 a. State the important factors to be considered while selecting the site for hydro – electric power plant. **(05 Marks)**

b. Explain the following terms related to hydroelectric power plant :
i) Penstock ii) Surge tank iii) Draft tube. **(06 Marks)**

c. The runoff data of a river at a particular site is tabulated below :

Month	Mean discharge per month (millions of M^3)	Month	Mean discharge per month (millions of M^3)
January	40	July	75
February	25	August	100
March	20	September	110
April	10	October	60
May	0	November	50
June	50	December	40

i) Draw a hydrograph and find the mean flow.
ii) Also draw the flow duration curve.
iii) Find the power in MW available at mean flow if the head available is 80m and overall efficiency of generation is 85%. Take each month of 30 days. **(09 Marks)**

PART - B

5 a. With the help of a sketch, show all the important parts of a nuclear reactors. Describing briefly the functions of each part. **(08 Marks)**

b. What is a moderator in nuclear reactors? Explain the desirable properties of good moderator. **(06 Marks)**

c. Describe with working principle of pressurized water reactor, highlighting its advantages and disadvantages. **(06 Marks)**

6 a. With a sketch, explain the working of an instrument used to measure global radiation of solar energy. **(08 Marks)**

b. Sketch and explain horizontal axis wind mill. **(06 Marks)**

c. With a neat diagram, explain a solar pond electric power plant. **(06 Marks)**

7 a. Describe with a neat sketch of a closed cycle OTEC system and also mention the advantages over open cycle system. **(08 Marks)**

b. Explain with neat sketch, low and high tides and state important limitations of tidal power generation. **(06 Marks)**

c. With a sketch, explain the working of "Hot dry rock" geothermal plant. **(06 Marks)**

8 a. What is gasification? How are the gasifiers classified? With a schematic diagram, explain any one of the gasifiers. **(10 Marks)**

b. Write short notes on :

i) Anaerobic fermentation. **(05 Marks)**

ii) Photosynthesis. **(05 Marks)**

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