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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Eighth Semester, B.E. - Mechanical Engineering

Semester End Examination; Aug. / Sep. - 2020

Power Plant Engineering

M. S. Devishankar

Time: 3 hrs

Max. Marks: 100

- Note: i) Answer **TWO** full questions, selecting **ONE** full question from **UNIT - I** and **UNIT - II**.
 ii) Answer any **THREE** full questions, choosing from **UNIT - III**, **UNIT - IV** and **UNIT - V**.

UNIT - I

- 1 a. With a neat sketch, explain geothermal energy conversion process. 8
 b. With a neat sketch, explain harnessing of tidal energy. 6
 c. Explain thermoelectric power generator with a neat sketch. 6

OR

- 2 a. Define the following terms :
 i) Average load on the power station ii) Load curve 8
 iii) Diversity factor iv) Demand factor
 b. The annual peak load on a 30 MW power station is 25 MW. The power station supplies loads having maximum demands of 10 MW, 8.5 MW, 5 MW and 4.5 MW. The annual load factor is 45%. Find; 12
 i) Average load ii) Energy supplied per year
 iii) Diversity factor iv) Demand factor

UNIT - II

- 3 a. With a neat sketch, explain pumped storage plant. 8
 b. The run off data of a river at a particular site is tabulated below [take 30 days in a month];

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Discharge	45	30	20	15	0	50	75	100	110	70	60	40

- i) Draw hydrograph and flow duration curve 12
 ii) If the head available is 80 meter and overall efficiency of generation is 85%. Find the power in MW available at mean flow of water [Discharge in millions of m³/month, month = 30 days]

OR

- 4 a. With a neat sketch, explain the working of travelling grate type stoker. 10
 b. Explain the unit system of handling pulverized coal with a neat sketch. 10

UNIT - III

- 5 a. With a neat sketch, explain the working of Loeffler Boiler. 10
 b. With a neat sketch, explain the working of Lamont Boiler. 10

Contd...2

- 6 a. Describe the working of the wet cooling tower with suitable sketch. 7
b. With a neat sketch, explain screw conveyor. 6
c. With a neat sketch, explain mechanical ash handling system. 7

UNIT - IV

- 7 a. With a neat sketch, briefly explain cooling system in diesel power plant. 10
b. Explain the methods of starting diesel engines. 10
8 a. With necessary sketches, explain Direct open cycle and Indirect open cycle gas turbines. 10
b. List the advantages, disadvantages, and applications of gas turbine power plants. 10

UNIT - V

- 9 a. Explain briefly Fission and Fusion reactions. 10
b. Write a note on essential components of a nuclear reactor. 10
10 a. Explain with a neat sketch sodium-graphite reactor. 10
b. With a neat sketch, explain gas cooled reactor. 10

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