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

(An Autonomous Institution affiliated to VTU, Belagavi)
 Seventh Semester, B.E. - Mechanical Engineering
 Semester End Examination; February - 2022
 Power Plant Engineering

Time: 3 hrs

Max. Marks: 100

Course Outcomes

The Students will be able to:

- CO1: Analyze economics of power plants and list factors affecting the power plants and interpret the performance of power plants based on load variations.
 CO2: Summarize the working principle of hydro-electric power plant and different types of stokers and oil burners in thermal power plant.
 CO3: Explain the elements and their functions of steam power plants.
 CO4: Identify elements and their functions and operations of Diesel, gas and solar power plants.
 CO5: Explain the principles of release in nuclear energy from reactors and Identify the social and economic issues of power plants.

Note: I) PART - A is compulsory. **Two** marks for each question.

II) PART - B: Answer any One sub questions (from a, b) for Maximum of **18 marks** from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
I : PART - A		10			
I a.	Define demand factor.	2	L1	CO1	PO1
b.	Define mass curve.	2	L1	CO2	PO1
c.	Define boiler.	2	L1	CO3	PO1
d.	Define a solar cell.	2	L1	CO4	PO1
e.	Name any two nuclear fuels.	2	L1	CO5	PO1
II : PART - B		90			
UNIT - I		18			
1 a.	Briefly explain Indian energy scenario with respect to power plants with examples.	9	L2	CO1	PO1
b.	A base load power station and standby power stations. Share a common load as follows: i) Base load station annual output = 150×10^6 kWh ii) Base load station capacity = 35 MW iii) Maximum demand on base load station = 30 MW iv) Stand by station capacity = 18 MW v) Stand by station annual output = 14×10^6 kWh vi) Maximum demand (Peak load) on standby station = 15 MW Determine the following for both power stations: I) Load factor II) Capacity / plant factor	9	L4	CO1	PO3
c.	List and explain choice / selection of power plant.	9	L2	CO1	PO1

UNIT - II**18**

- 2 a. Explain various elements of general arrangements for Hydro-Electric power plants with a neat sketch.
- b. The mean monthly discharge of a particular site is given below.
Draw; i) Hydrograph ii) Flow duration curve

9 L2 CO2 PO1

Month	Discharge, m ³ /s	Month	Discharge, m ³ /s
Jan	200	July	2000
Feb	450	Aug	2400
Mar	600	Sept	1800
Apr	1200	Oct	1200
May	1500	Nov	800
Jun	1600	Dec	400

9 L4 CO2 PO3

- c. Sketch and explain bin system of burning polarized coal. List its advantage and disadvantages.

9 L2 CO2 PO1

UNIT - III**18**

- 3 a. Explain La Mont boiler with the help of a neat sketch.
- b. Differentiate between Super heaters and Re-heaters.
- c. Classify Ash handling system. Explain Pneumatic system of Ash handling with a neat sketch.

9 L2 CO3 PO1

9 L2 CO3 PO1

9 L2 CO3 PO1

UNIT - IV**18**

- 4 a. Explain general layout of diesel generation power plant with a diagram.
- b. List and explain the advantages and disadvantages of Gas turbine power plant.
- c. Classify solar power plants. Explain the Maximum Power Point Tracker (MPPT) in solar power plants.

9 L2 CO4 PO1

9 L2 CO4 PO1

9 L2 CO4 PO7

UNIT - V**18**

- 5 a. Classify the types of nuclear reactor. Explain pressurized water reactor with a neat sketch.
- b. Discuss in brief social and economic issues of power plants with examples.
- c. Explain global warming, its effects and its control with respect to safety environmental impact of power plants.

9 L2 CO5 PO1

9 L2 CO5 PO6

9 L2 CO5 PO7

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