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

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester, B.E. - Electrical and Electronics Engineering

Semester End Examination; August - 2023

Power Plant Engineering

Time: 3 hrs *Max. Marks: 100*

Course Outcomes

The Students will be able to:

CO1: Understand the conceptual working principles of conventional source of electric power generation.
CO2: Explain the detail descriptions of hydroelectric plants, nuclear power plants and gas power plants.
CO3: Analyze the power generation using non-Conventional Energy Sources.
CO4: Understand the concept of load curves and different tariff.
CO5: Understand the concept of grounding and power factor improvement.

***Note**: I) **PART - A** is compulsory. **Two** marks for each question.*
*II) **PART - B**: Answer any **Two** sub questions (from a, b, c) for a Maximum of **18 marks** from each unit.*

Q. No.	Questions	Marks	BLs	COs	POs
	I : PART - A	**10**			
1 a.	What are the functions of a penstock and trash rack in hydro power plant?	2	L1	CO1	PO1
b.	Mention the main components of a diesel power plant.	2	L1	CO2	PO1
c.	Mention the advantages of non-conventional energy sources.	2	L1	CO3	PO1
d.	Mention the effects of low power factor.	2	L1	CO4	PO1
e.	What are the advantages of Neutral grounding system?	2	L1	CO5	PO1
	II : PART - B	**90**			
	UNIT - I	**18**			
2 a.	Briefly describe the different classifications of hydro power plant.	9	L2	CO1	PO2
b.	Explain the working of steam power plant with neat schematic diagram.	9	L2	CO1	PO2
c.	How coal is utilized in power station, starting from delivery to final combustion stage?	9	L3	CO1	PO2
	UNIT - II	**18**			
3 a.	Explain main parts of a nuclear reactor and state their functions.	9	L2	CO2	PO2
b.	With a neat diagram, explain BWR and PWR.	9	L3	CO2	PO2
c.	Explain the factors required for the choice and characteristic of the diesel station.	9	L3	CO2	PO2

Contd... 2

	UNIT - III	**18**			
4 a.	What is tidal energy? With neat diagram, explain the method of harnessing the tidal energy.	9	L2	CO3	PO2
b.	(i) Explain wind energy power plant.	4	L2	CO3	
	(ii) With the help of block diagram, write a brief note on geothermal power.	5	L2	CO3	PO2
c.	Write a note on distributed generation and brief any five application area of distributed generation.	9	L3	CO3	PO2
	UNIT - IV	**18**			
5 a.	Define the following terms used in power plant operation: i) Diversity factor ii) Load factor iii) Plant capacity factor iv) Plant use factor v) Utilization factor	9	L2	CO4	PO2
b.	What is tariff? Explain different types of tariff.	9	L2	CO4	PO2
c.	(I) A generating station supplies the following loads to various consumers: Industrial consumer = 750 MW Commercial establishment = 350 MW Domestic power = 10 MW Domestic light = 50 MW If the maximum demand on the station is 1000 MW and the number of kWh generated per year is 50×10^5 , determine; i) The diversity factor ii) Annual load factor	5 4	L5 L5	CO4 CO4	PO2 PO2
	(II) A generating station has a maximum demand of 500 MW. The annual load factor is 50% and capacity factor is 40%. Find the reserve capacity of the plant.				
	UNIT - V	**18**			
6 a.	Explain the necessity of phase angle control in an interconnected station.	9	L3	CO5	PO2
b.	Write a note on ; i) Resistance grounding ii) Resonant grounding	5 4	L2	CO5	PO2
c.	What are the main neutral grounding practices? Write a note on earthing transformer.	9	L2	CO5	PO2

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