Total number of printed pages:02

D/5th/DEE511

2023

GENERATION, TRANSMISSION AND DISTRIBUTION OF POWER

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.	a)	Write some important criteria for site selection of thermal power plants.	7
	b)	What are the major equipment use in thermal power plants?	5
	c)	A 100 MW coal-fired power station uses coal of calorific value 6400 Kcal/Kg. Thermal efficiency of the station is 30% and electrical efficiency is 90%. Calculate the coal consumption per hour when the station is delivering its full rated output.	5
	d)	Derive a relation between electrical and heat energy.	3
2	a)	Discuss about some important advantages and disadvantages of hydroelectric power plants.	4+4=8
	b)	Write about the classification of hydroelectric power plants.	5
	c)	How hydraulic turbines are classified ?	5
	d)	Draw a top view of hydro power plant	2
3.	a)	Write a short note on pump storage plant	5
	b)	A 100MW hydro-electric station is supplying full-load for 10 hours a day. Calculate the volume of water which has been used. Assume effective head of station as 200m and overall efficiency of the station as 80%	5
	c)	Derive a relation between electrical energy and mechanical energy	5
	d)	Write the SI units of the following – Force, acceleration due to gravity, energy, power and velocity	1×5=5
4.	a)	Discuss about the important advantages and disadvantages of diesel engine power plants.	4+4=8
	b)	Draw a general layout of diesel engine power plant.	3
	c)	A diesel engine power plant has one 700 kW and two 500 kW generating	7

		units. The fuel consumption is 0.28 kg/kWh and the calorific value of fuel oil is 10200 kcal/kg. Estimate- (i) the fuel oil required for a month of 30 days and (ii) overall efficiency. Plant capacity factor is 40%.	
	d)	Which machine is used as prime mover in diesel engine power plant ?	2
5.	a)	What are the main components of overhead transmission lines ?	5
	b)	Draw a neat diagram of an overhead line pole showing various components and height from the ground.	9
	c)	Write the names of different insulators used in overhead lines.	4
	d)	ACSR conductors are used for transmission of electric power. What is the full form of ACSR.	2
6.	a)	With neat diagrams, explain AC distribution systems.	5+5=10
	b)	Compare overhead and underground system of electric power distribution	8
	c)	What is the frequency and magnitude of AC voltage commercially used in India ?	1+1= 2