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Reg. No. : | | | | | | | | | | |

Question Paper Code: 59710

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2024

Elective

Mechanical Engineering

15UME910 - POWER PLANT TECHNOLOGY

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The thermal efficiency of a steam power station is CO1- R

(a) 38% (b) 40% (c) 28% (d) 45%

2. The cheapest plant in operation and maintenance is CO1- R

(a) Hydro-electric power plant (b) Steam power plant

(c) Nuclear power plant (d) Diesel power plant

3. A thermal power plant working between the temperatures of 800 K and 300 K has the maximum thermal efficiency of CO2- R

(a) 62.5 % (b) less than 62.5 % (c) 45 % (d) 37.5 %

4. Equipment used for pulverizing the coal is CO2- R

(a) Hopper (b) Stoker (c) Ball mill (d) None of these

5. The primary fuel used in nuclear power plants is CO3 -R

(a) U^{235} (b) U^{238} (c) Pu_{239} (d) Pu_{233}

6. In which of the reactors is the steam generated in the reactor itself? CO3 -R

(a) Pressurized water reactor (b) Boiling water reactor

(c) Liquid metal fuelled reactor (d) All the above

7. The diesel plants are mainly used as _____ CO4- R

(a) Peak load plants (b) Base load plants (c) Standby power plants (d) None of these

8. Diesel power plant can be used as central station where the capacity required is CO4 -R

(a) 1 to 2 MW (b) 2 to 5 MW (c) 5 to 10 MW (d) 10 to 15 MW

9. Tidal energy utilizes _____ energy of water. CO5 -R

(a) Kinetic (b) Potential (c) Heat (d) None of these

10. OTEC power plant has the thermal efficiency in the order of CO5-R

(a) 1 – 1.5 % (b) 2 – 5 % (c) 10 % (d) 15 %

PART – B (5 x 2= 10 Marks)

11. List out the various conventional and non conventional power plants. CO1- R

12. Why ash handling system is needed? CO2 -U

13. Define reproduction factor of nuclear fission reaction. CO3 -R

14. List the advantages of two stroke engine when used in diesel power plant. CO4 -R

15. List out the advantages of tidal power plants. CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) Draw the simple MHD power plant and the layout MHD open cycle generator and explain its functions of components. CO1- U (16)

Or

(b) Discuss about the combined operation of Thermo Electric-steam power plant. CO1- U (16)

17. (a) Explain the various draught systems with a neat sketch. CO2- U (16)

Or

(b) Briefly explain the ball and race mill system used for pulverization of coal with neat diagram. CO2- U (16)

18. (a) Discuss the construction and working principle of nuclear Power plant with a neat sketch. CO3- U (16)

Or

(b) Explain the construction and working of boiling water reactor with neat diagram. CO3- U (16)

19.	(a)	Explain about open cycle gas turbine and closed cycle gas turbine with neat sketch**.**	CO4- U	(16)
		Or		
	(b)	Briefly explain the construction and working principle of diesel power plant.	CO4 -U	(16)
20.	(a)	Explain the working principle of geo thermal energy conservation system with neat sketch.	CO5 -U	(16)
		Or		
	(b)	Explain any two types of solar collectors and list their advantages and disadvantages.	CO5- U	(16)

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