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Reg. No. :

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Question Paper Code: 59710

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Elective

Mechanical Engineering

15UME910 - POWER PLANT TECHNOLOGY

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

PART A - (10 x 1 = 10 Marks)

1. Location of the surge tank in a hydro-electric station is near to the CO1- R
(a) Tailrace (b) Turbine (c) Reservoir (d) Draft tube
2. Which power requires more space CO1- R
(a) Nuclear power plant (b) Hydro-electric power plant
(c) Thermal 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. The percentage of volume occupied by the tubes in the surface condenser shell is CO2- R
(a) 5% (b) 10% (c) 15% (d) 20%
5. Natural uranium contains CO3 -R
(a) more than 99% U^{235} (b) more than 99% U^{238}
(c) about 50% U^{235} and 50% U^{238} (d) about 10% U^{235} and 90% U^{238}
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. For a constant fuel supply, the supercharging of Diesel power plant CO4- R
 (a) decreases the thermal efficiency (b) has no effect of power output
 (c) increases the power output (d) decreases the power output
8. In a gas turbine power plant, the maximum pressure ratio is limited to CO4 -R
 (a) 5 (b) 10 (c) 15 (d) 20
9. OTEC power plant has the thermal efficiency in the order of CO5 -R
 (a) 1 – 1.5 % (b) 2 – 5 % (c) 10 % (d) 15 %
10. As the load factor of generating plant increases, the generation cost per CO5-R
 unit energy generated
 (a) decreases (b) increases
 (c) may increase or decrease (d) remains the same

PART – B (5 x 2= 10Marks)

11. Mention the factors that should be considered while selecting a site for a diesel CO1- R
 power plant.
12. What are the factors affecting the performance of electrostatic precipitators? CO2 -U
13. Define: Chain reaction. CO3 -R
14. List the types of Diesel plants CO4 -R
15. What are the causes and effect of acid rain? CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Describe Hydel power plant layout with their salient features. CO1 -App (16)
 Or
 (b) (i) Sketch the layout of gas and steam combined power plants CO1- App (8)
 with and without reheat system.
 (ii) Demonstrate the open cycle MHD power plant describing CO1- App (8)
 briefly the components of the system.
17. (a) With neat layout, explain Steam power plant operation and also CO2 -App (16)
 state their advantages and disadvantages.
 Or
 (b) (i) Explain the forced and induced draught systems with simple CO2 -U (10)
 sketches.
 (ii) Explain briefly the hyperbolic cooling tower used in steam CO2 -Ana (6)
 power plant with simple diagram.

18. (a) Discuss any two types of reactors with their advantages and disadvantages CO3 -Ana (16)
- Or
- (b) Explain the construction and working of boiling water reactor with neat diagram along with its advantages and disadvantages. CO3 -U (16)
19. (a) Explain the various systems of diesel electric power plant. CO4- U (16)
- Or
- (b) Describe about Open cycle and Closed cycle gas turbine with sketch and discuss about their merits and demerits CO4 -U (16)
20. (a) Explain any two types of solar collectors and list their advantages and disadvantages. CO5 -U (16)
- Or
- (b) Describe the construction and working principle of Geo thermal power plant with neat sketch and state their advantages and disadvantages. CO5- U (16)

