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

Question Paper Code : 51502

B.E/B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Fourth Semester

Electrical and Electronics Engineering

EE 2252/EE 43/EE 1252/10133 EE 403/080280027 – POWER PLANT ENGINEERING

(Regulations 2008/2010)

Time : Three Hours **Maximum : 100 Marks**

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. What are the four main circuits of a Thermal Power Plant ?

2. Write the use of Water Level Indicator in boiler.

3. What is the function of draft tube ?

4. List any four advantages of hydro-electric power plant.

5. Compare Nuclear fission with fusion processes.

6. What are the desirable properties of a good moderators ?

7. What are the methods by which the efficiency of an open cycle gas plant can be improved ?

8. What is meant by regeneration ?

9. What is a solar cell ?

10. List out the types of geothermal resources.

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Draw the layout of a modern steam power plant and explain its working principle. **(12)**

(ii) What do you understand by the term "Boiler draught" ? **(4)**

OR

(b) (i) What is fluidised Bed Combustion system ? Sketch and describe a Fluidised Bed Combustion (FBC) system. **(10)**

(ii) Enumerate various modern ash-handling systems. **(6)**

12. (a) (i) Describe the various selection factors of hydraulic turbines in hydro plants. **(8)**

(ii) Discuss how a surge tank helps in reducing a water hammer effect ? **(8)**

OR

(b) With the help of a schematic diagram, explain the working of a "pumped storage plant". List out its advantages and disadvantages. **(16)**

13. (a) (i) Explain the different types of nuclear reactions and initiation of nuclear reactions. **(8)**

(ii) Briefly explain the pressurized water reactor (PWR) with neat sketch. **(8)**

OR

(b) (i) Explain the Boiling Water Reactor (BWR) with neat sketch. Give its advantage and disadvantage. **(8)**

(ii) Explain the different methods for nuclear waste disposal with necessary sketch. **(8)**

14. (a) A gas turbine plant of 800 kW capacities takes the air at 1.01 bar and 15 °C. The pressure ratio of the cycle is 6 and minimum temperature is limited to 700 °C. A regenerator of 75% effectiveness is added in the plant to increase the overall efficiency of the plant. The pressure drop in the combustion chamber is 0.15 bars as well as in the regenerator is also 0.15 bars. Assuming the isentropic efficiency of the compressor 80% and of the turbine 85%, determine the plant thermal efficiency. Neglect the mass of the fuel. **(16)**

OR

(b) A four-stroke diesel engine has a piston diameter 16.5 cm and a stroke of 27 cm. The compression ratio is 14.3, the cut-off 4.23% of the stroke and the mean effective pressure 4.12 bar. The engine speed is 264 rev/min and the fuel consumption is 1.076 kg of oil per hour, having a calorific value of 39150 kJ/kg. Calculate the relative efficiency of the engine. **(16)**

15. (a) With a neat diagram, explain MHD power generation technology and list its advantages. **(16)**

OR

(b) Write a technical note on the following : **(6 + 5 + 5)**

(i) Fuel cell

(ii) Thermionic converter

(iii) Geothermal power generation