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

Question Paper Code : 31396

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Fourth Semester

Electrical and Electronics Engineering

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

(Regulation 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. For which purposes Hydro projects are developed?

4. Define Run-off.

5. Define Demand for Electricity.

6. What are isotopes?

7. Write the classification of gas turbine.

8. Write two advantages of diesel power plants.

9. Define Law of conservation of Energy.

10. Write the use of thermionic converter.

PART B — (5 × 16 = 80 marks)

11. (a) Explain the working of Ball and Race Mill. (16)

Or

(b) An impulsive stage of a steam turbine is supplied with dry and saturated steam at 14.7 bar. The stage has a single row of moving blades running at 3600 rev/min. The mean diameter of the blade disc is 0.9 m. The nozzle angle is 15° and the axial component of the absolute velocity leaving the nozzle is 93.42 m/s. The height of the nozzles at their exit is 100 mm. The nozzle efficiency is 0.9 and the blade velocity co-efficiency is 0.966. The exit angle of the moving blades is 2° greater than at the inlet. Determine :

(i) The blade inlet and outlet angles

(ii) The isentropic heat drop in the stage

(iii) The stage efficiency

(iv) The power developed by the stage. (16)

12. (a) Compare the working of Francis turbine with Pelton wheel and explain the drawbacks of the Francis compared with Pelton. (16)

Or

(b) With neat schematic explain the following :

(i) Low head hydro plant (8)

(ii) Pumped storage power plant. (8)

13. (a) What is meant by uranium enrichment? Describe some methods of Uranium enrichment. (16)

Or

(b) Explain the various factors to be considered while selecting the site for nuclear plant. (16)

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 maximum 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 of 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) Discuss about Hot springs and Steam ejection. (16)

Or

(b) Describe the Fuel cell Technology. (16)
