Roll. No								

B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV /DEC 2011

ELECTRICAL AND ELECTRONICS ENGINEERING BRANCH

SECOND SEMSTER

ME 9153 – POWER PLANT ENGINEERING

(REGULATIONS 2008)

Time: 3 hrs   Max Mark: 100

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1. Draw the simple layout of steam power plant indicating its various components.

2. What is boiler efficiency?

3. What is a surge tank? Why it is important in a hydro-plant?

4. Enlist the advantages and disadvantages of water power.

5. Explicate a fission reaction with an example.

6. What are the functions of a reflector?

7. Enlighten the effect of regeneration in a gas turbine power plant.

8. Name the essential components of diesel electric plant.

9. What are the limitations of a MHD-steam power plant?

10. Enumerate the advantages of hydrogen as a fuel.

Part – B (5 x 16 = 80 Marks)

11 a Explain with detailed layout the working and functions of various components of (16) steam power plant.

12 a Discuss the following in detail (i) Pumped storage plants (ii) Selection of water (16) turbines.

(Or)

  b Explain with neat sketch the essential elements of hydroelectric power plant. (16)

13 a Describe the working of Boiling Water reactor and Heavy Water Reactors with neat (16) sketch.

(Or)

  b Draw the layout of a nuclear power plant and explain the construction and working of (16) various components.

14 a A gas turbine power plant consists of a two stage compressor with inter-cooling and (16) a single stage turbine with a regenerator. Air enters the compressor at 1 bar, 20°C. The maximum temperature of the cycle is limited to 900°C and the maximum pressure ratio is 6. The effectiveness of the regenerator is 0.7. The rate of air flow through the plant is 210 kg/s and calorific value of fuel used is 40.8 MJ/kg. The isentropic efficiency of both the compressors is 0.82, the isentropic efficiency of the turbine is 0.92, the combustion efficiency is 0.95. Take for air c_p=1.005 kJ/kg K and γ=1.4 and for gases c_p=1.08 kJ/kg K and γ=1.33. assuming perfect inter-cooling and neglecting pressure and heat losses, estimate (a) the air-fuel ratio (b) the cycle efficiency (c) the power supplied by the plant and (d) the specific fuel consumption of the plant and the fuel consumption per hour.

(Or)

  b Portray the schematic arrangement of a diesel engine power plant and explain the (16) functions of various component of Diesel engine power plant

15 a Discuss in detail about solar energy. Solar thermal power conversion and power (16) generation

(Or)

  b Explain the following (i) OTEC (ii) Wind power plants (iii) Tidal power plants (16)