



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

MECHANICAL ENGINEERING BRANCH

SEVENTH SEMESTER.

**ME 9401 POWER PLANT ENGINEERING**

(REGULATIONS 2008)

Time: 3 hr

Max. Mark: 100

Answer ALL Questions

Part – A (10x 2 = 20 Marks)

1. What is the function of a draft tube in a hydraulic turbine?
2. Why is power generation by gas turbines attractive these days?
3. What are the three distinct zones of combustion in a CFB furnace?
4. Why is a liquid metal the preferred coolant in a fast reactor?
5. What is a calandria in a CANDU reactor?
6. What are the different working fluids in binary cycle geothermal power plants?
7. What do you mean by shrinking and swelling in the level measurement of feed water in a boiler?
8. What is meant by combined cycle cogeneration?
9. Why are base load plants loaded heavily?
10. What do you mean by diversity factor in a power plant?

Part – B (5 X 16 =80)

11. The following load is to be supplied by a power station:

Load (MW)	30	90	60	100	50
Time (hours)	0-6	6-12	12-14	14-18	18-24

- i. Draw the load curve and load duration curve
- ii. Choose the suitable generating units to supply the load
- iii. Calculate the load factor and plant capacity factor (6+4+6)

12. a. i. Explain with the characteristic features and working of Liquid Metal Fast Breeder Reactor with a neat sketch. (12)
- ii. What are the various factors to be considered in selecting the site for a hydro electric power plant? (4)

**OR**

- b. i. Draw the general layout of a thermal power plant and explain the working of different circuits. (12)
- ii. Write any three advantages and disadvantages of diesel power plants. (4)

13. a. Write short notes on the following:

- i. Working of MHD generator with a neat diagram.
- ii. Working of Molten Carbonate Fuel Cells with a neat sketch. (8+8)

**OR**

b. Discuss the effects of the following:

- i. Reheating and regeneration in a gas turbine plant.
- ii. The overall efficiency of Brayton / Rankine combined cyclic power plants when they are connected in series and parallel. (8+8)

14. a. i. Explain the construction and working of optical pyrometer with a neat sketch. (10)
- ii. Explain briefly about the electromagnetic transducers. (6)

**OR**

- b. i. Explain the working of paramagnetic oxygen analyser with a neat diagram (8)
- ii. Explain the working principle of CO<sub>2</sub> analyser with a neat diagram. (8)

15. a. i. Explain the various direct and indirect methods of solar energy utilization. (10)
- ii. What are the merits and drawbacks of utilizing ocean wave energy in generating electricity? (6)

**OR**

- b. i. Discuss the environmental effects of thermal and nuclear power plants. (8)
- ii. Explain the scope of generating electricity from biomass. (8)