

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER V • EXAMINATION – WINTER - 2012****Subject code: 151906****Date: 23-01-2013****Subject Name: Conventional Power Engineering****Time: 02:30 pm to 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Draw general layout of modern thermal power plant, label major component and explain functions of each component. **07**
- (b) Describe working of diesel power plant with suitable diagram. Write merits and demerits of diesel power plant over other types. **07**
- Q.2** (a) Calculate the efficiency and specific work output of a simple gas turbine plant operating on Brayton cycle. The maximum and minimum temperatures are 1000K and 288K respectively. The pressure ratio is 6. The isentropic efficiency of the compressor and turbines are 85% and 90% respectively. If the unit consumes 2 tonnes of oil per hour of calorific value 46500 KJ per kg, determine the power generated. The mechanical efficiency is 90% and generation efficiency is 85%. **07**
- (b) Write advantages and disadvantages of Hydroelectric power plant. Also write classification for hydraulic turbines. **OR** **07**
- (b) With the help of a neat sketch explain the working of pressurized water reactor (PWR). Also write advantages over others. **07**
- Q.3** (a) Which are the methods to meet with variable loads on power plants **07**
- (b) With the help of neat sketch explain construction and working of Francis turbine. **07**
- OR**
- Q.3** (a) Explain Diversity factor and demand factor. A thermal power plant consists of two 60 MW units each running for 7800 hours and one 25 MW unit running for 2600 hours per year. The energy produced by the plant is 800×10^6 KWh/year. Determine plant load and plant use factor. Assume maximum demand is equal to plant capacity. **07**
- (b) What are the criteria for selection of sites for hydro electric power plant? Differentiate between Impulse and reaction water turbines. **07**
- Q.4** (a) Give detail classification of steam turbines. What is compounding of steam turbine. State the different methods of compounding of steam turbine? **07**
- (b) What is fission? Explain with neat sketch construction and working of liquid metal cooled reactor. **07**
- OR**
- Q.4** (a) State the functions of engine cooling system. With the help of neat sketch explain working of thermostat cooling system. **07**
- (b) What is intercooling and regeneration? Sketch simple line diagram and T-s diagram of open cycle gas turbine with intercooling, reheating and regeneration. **07**
- Q.5** (a) Explain in detail Nuclear waste and its disposal. **07**
- (b) State the various methods of governing of steam turbines. Explain nozzle governing with neat sketch. **07**
- OR**
- Q.5** (a) Explain with neat sketch full pressure lubrication system for diesel power plant. **07**
- (b) What are the basic resources in India for power generation? What are the general site selection criteria for thermal power plant? **07**
