

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII EXAMINATION – WINTER 2025

Subject Code:3171910

Date:24-11-2025

Subject Name:Power Plant Engineering

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Draw a schematic diagram of basic steam power plant. **03**
(b) Discusses disadvantages of Thermal Power Plant. **04**
(c) Explain with neat sketch of any one type of high-pressure boiler. **07**
- Q.2** (a) Draw the line diagram of constant pressure open cycle Gas turbine power plant. **03**
(b) Write advantages of closed cycle Gas turbine power plant. **04**
(c) A Gas turbine unit has pressure ratio of 6:1 maximum temperature of 627 °C. **07**
The isentropic efficiency of compressor and turbine are 0.82 and 0.85 respectively. Calculate the power output in kW of an electric generator generated to the turbine when the air enters the compressor at 15 °C at the rate of 18 kg/sec. Assume $C_p = 1.005$ kJ/kg K and $\gamma = 1.4$ for the compressor.
- OR**
- (c) Explain with neat sketch of Natural boiler draft. **07**
- Q.3** (a) What is coal handling system? **03**
(b) Define nuclear fission and nuclear fusion. **04**
(c) Explain pressurize water reactor (PWR) nuclear power plant. **07**
- OR**
- Q.3** (a) What is the function of an oil burner? **03**
(b) Draw the neat sketch of CANDU reactor power plant. **04**
(c) What are factors should be considered for site selection of nuclear power plant? **07**
- Q.4** (a) Write any two advantages of Geothermal energy system. **03**
(b) What is Tidal energy? **04**
(c) Explain principle of operation of hydro-Electric power plant. **07**
- OR**
- Q.4** (a) State types of fuels used in fuel cells. **03**
(b) What is the principle of operation photo voltaic cells? **04**
(c) Write advantages and disadvantages of wind energy system. **07**
- Q.5** (a) Define Load curves. **03**
(b) What are the various application of Gas Turbine? **04**
(c) Explain about pollution from thermal power plant and its harmful effects. **07**
- OR**
- Q.5** (a) Define plant capacity factor. **03**
(b) Draw the sketch of convergent divergent type steam nozzle. **04**
(c) Explain about acid rains and its effects. **07**
