

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3171718****Date:01-12-2023****Subject Name: Power Plant Instrumentation****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) List out various sources of electrical energy for power plant. Explain any two non convention energy source used in power plant. **03**
- (b) Brief four objectives of implementation of instrumentation over power plant. **04**
- (c) Draw and describe generic functional diagram of Thermal Power Plant in context to instrumentation. **07**
- Q.2** (a) How functionally ID fan is differing than FD fan? Discuss it **03**
- (b) Which parameters degrade fuel consumption efficiency? Suggest an engineering solution to minimize it. **04**
- (c) List the parameters to be evaluated for Boiler control scheme. How all these are helpful to improve the efficiency of the boiler? Brief it. **07**
- OR**
- (c) Draw and describe 3-element Drum level control over to boiler. **07**
- Q.3** (a) Implement Air to Fuel ration control over boiler. **03**
- (b) Draw the schematic of Turbine and describe its function in power plant. **04**
- (c) List the name of parameters which will be very critical in turbine Monitoring & control system. How do you minimize turbine vibration? Brief it. **07**
- OR**
- Q.3** (a) Explain design concepts of instrumentation for CWR and PWR reactor **03**
- (b) Explain boiler feed water circuit with necessary diagram. **04**
- (c) What exactly flue gases are? Describe proper instrumentation control scheme to minimize production of flue gases during combustion. **07**
- Q.4** (a) Draw and describe economizer **03**
- (b) What types of impurities is associated with boiler feed water? Brief at least two instruments which will be measured it. **04**
- (c) Draw P&I diagram for any loop of utility section of power plant,. Given proper tag of instruments used in given P&I diagram. **07**
- OR**
- Q.4** (a) Describe the objective of DM plant in thermal power plant. **03**
- (b) Explain the working of lubrication system in conjunction with turbine operation. **04**
- (c) Draw P&I diagram for any loop of boiler. Given proper tag of instruments used in given P&I diagram **07**

- Q.5** (a) Write at least two benefits of nuclear power plant. **03**  
(b) Write at least two drawback of nuclear power plant. How do instrumentation offering safety over it? Brief it **04**  
(c) Explain operation diagram of Nuclear power plant with net sketch. List out significant instrumentation on “any one element/components of it”. **07**

**OR**

- Q.5** (a) How effluent control is very important in Hydro plant operation? Discuss it. **03**  
(b) Why the selection of location is very important to construct Hydro-Power Plant? Brief it **04**  
(c) Draw and describe working of hydra power plant. **07**

\*\*\*\*\*