

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV (NEW) EXAMINATION – SUMMER 2021****Subject Code:3140914****Date:09/09/2021****Subject Name:Power System- I****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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Define: Load factor, Demand factor and Diversity factor.	03
	(b) Discuss present power generation scenario in Gujarat and India with presenting proper data.	04
	(c) Explain the steam power station with neat schematic diagram. Also discuss advantages and disadvantages of steam power station. Also write the points, which are considered during the site selection of steam power plant.	07
Q.2	(a) Explain load curve and load duration curve with their importance.	03
	(b) Compare steam power plant, hydro power plant and nuclear power plant.	04
	(c) Explain nuclear power plant with proper diagram. Also discuss advantages and disadvantages of nuclear power plant.	07
OR		
	(c) A synchronous motor improves the power factor of a load of 200 kW from 0.8 lagging to 0.9 lagging. Simultaneously the motor carries a load of 80 kW. Find (i) the leading kVAR taken by the motor (ii) kVA rating of the motor and (iii) power factor at which the motor operates.	07
Q.3	(a) Write merits and demerits of wind energy. Write the types of wind energy system.	03
	(b) Differentiate between horizontal and vertical axis wind turbine.	04
	(c) What is power factor? Discuss the methods of power factor improvement.	07
OR		
Q.3	(a) Define tariff. Write the types of tariff.	03
	(b) Discuss the comparison of overhead transmission system with underground transmission system.	04
	(c) Explain Photovoltaic cell for electrical power generation. Write applications of solar energy.	07
Q.4	(a) What are the causes of low power factor?	03
	(b) What is string efficiency? Explain methods of improving string efficiency.	04
	(c) Calculate the capacitance of a 100 km long 3-phase, 50 Hz overhead transmission line consisting of 3 conductors, each of diameter 2 cm and spaced 2.5 m at the corners of an equivalent triangle.	07

OR

- Q.4** (a) Compare indoor substation with outdoor substation. **03**
(b) Explain the methods of neutral grounding. **04**
(c) Define substation. Explain the classification of substation considering different ways. **07**
- Q.5** (a) Write types of cable considering voltage and insulating materials. **03**
(b) What is a sag in overhead lines? Discuss the disadvantages of providing too small or too large sag on a line. **04**
(c) Derive an expression for the capacitance of a single phase overhead transmission line. **07**

OR

- Q.5** (a) List out the main components of overhead lines. Also write the types of insulators. **03**
(b) Derive an expression for the loop inductance of a single phase line. **04**
(c) Explain methods of distribution systems with necessary diagrams. **07**
