

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-IV (NEW) EXAMINATION – SUMMER 2022

Subject Code:3140914

Date:06-07-2022

Subject Name:Power System- I

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.

		MARKS
Q.1	(a) Enlist various equipments used in substation.	03
	(b) Explain pole mounted substation with suitable figure.	04
	(c) Give comparison of steam power station and hydro power station.	07
Q.2	(a) Explain with neat sketch the construction of cables.	03
	(b) What are the properties of insulating material for cables? name some insulating materials used in cables	04
	(c) Enlist different types of nuclear reactors. Explain working of pressurized water nuclear reactor with suitable diagram.	07
	OR	
	(c) A 3-phase transmission line being supported by three-disc insulators. The potential across top unit and middle unit are 8 kV and 11kV respectively. Calculate (i) the ratio of capacitance between pin and earth to the self-capacitance of each unit (ii) the line voltage and (iii) string efficiency.	07
Q.3	(a) Why starting motor is used in gas turbine power station? What is the main difference between open cycle and combine cycle gas power plant?	03
	(b) Draw block diagram of nuclear power station and explain working of nuclear station including chain reaction.	04
	(c) What is string efficiency? Derive its equation in case of 3-disc string. Explain methods of improving string efficiency	07
	OR	
Q-3	(a) Compare AC and DC supply systems.	03
	(b) What are the different methods of neutral grounding? Explain solid grounding. State its advantage and disadvantages.	04
	(c) With equation find out the volume of conductor in case of 3-phase 3-wire system and 3-phase 4-wire system in overhead power transmission.	07
Q-4	(a) What is tariff? Discuss three part tariff.	03
	(b) What are the factors that affect the sag in the transmission line?	04
	(c) Derive condition for most economic size of conductor in an underground cable.	07

OR

- Q-4** (a) Explain the disadvantages of low power factor. **03**
(b) Differentiate between Horizontal and Vertical Axis Wind Turbine. **04**
(c) What is solar photovoltaic system? Discuss its major components. Also state its applications. **07**

- Q-5** (a) Enlist the power factor improvement methods and describe any one method. **03**
(b) Explain the advantages of high voltage transmission line. **04**
(c) Define the sag in overhead line. Derive the equation of sag in case of When supports are at equal and unequal level. Also find the sag during effect of wind and ice loading **07**

OR

- Q-5** (a) What do you mean by transposition of line? What is its effect on the performance of the line? **03**
(b) Explain the effect of earth on capacitance. **04**
(c) Explain the inductance of three phase transmission line. **07**
