Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV EXAMINATION – SUMMER 2020

Subject Code: 2140908 **Date:27/10/2020**

Subject Name: Electrical Power Generation

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.**

			MARKS
Q.1	**(a)**	What is energy? List out all energy sources available in nature.	**03**
	(b)	What factors are taken into account while selecting the site for a hydro power station?	**04**
	(c)	Draw a schematic diagram of modern steam power station and explain its various components and their functions in detail.	**07**
Q.2	**(a)**	What do you understand by overall efficiency of a power plant? Why is the overall efficiency of thermal power station very low?	**03**
	(b)	Discuss advantages and disadvantages of diesel power plant.	**04**
	(c)	What is nuclear reactor? Explain with a neat sketch the various parts of a nuclear reactor.	**07**
		OR	
	(c)	Classify the hydro turbine according to operating heads. Explain the hydro turbine used for high operating heads.	**07**
Q.3	**(a)**	Draw the neat schematic arrangement of a nuclear power station.	**03**
	(b)	Explain the working principle of closed cycle gas turbine power plant with its schematic arrangement.	**04**
	(c)	Explain the need of hybrid systems. Discuss solar-wind hybrid power system with suitable diagram and also state its advantages.	**07**
		OR	
Q.3	**(a)**	What do you understand by tariff? Discuss the objectives of tariff.	**03**
	(b)	Define: (i) Load factor (ii) Maximum demand (iii) Plant capacity factor (iv) Diversity factor	**04**
	(c)	Define solar cell efficiency. Explain solar photovoltaic cell principle. Discuss current-voltage (I-V) characteristic of solar PV cell.	**07**
Q.4	**(a)**	What are the major components of wind energy conversion systems?	**03**
	(b)	Give the comparison of outdoor and indoor substations.	**04**
	(c)	A proposed station has the following daily load cycle:	**07**

Time in Hrs.	6-8	8-12	12-16	16-20	20-24	24-06
Load in MW	20	40	60	20	50	20

Plot the load curve and load duration curve. Find the load factor of the plant and the energy supplied by the plant in 24 hours.

OR

Q.4	**(a)**	Discuss the components of substation in brief.	**03**
	(b)	Define grounding. What are the advantages of neutral grounding?	**04**
	(c)	What are the different types of bus-bar arrangements used in sub stations? Illustrate your answer with suitable diagrams.	**07**
Q.5	**(a)**	How equipment earthing differs from neutral earthing?	**03**
	(b)	Write advantages of distributed generation.	**04**
	(c)	Explain the working of horizontal and vertical axis wind turbines.	**07**

OR

Q.5	**(a)**	List out the solar thermal system applications.	**03**
	(b)	Discuss the points and write the methods of site selection for locating the wind mills.	**04**
	(c)	Explain arc suppression coil grounding in detail.	**07**

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