Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-IV Examination June- 2010

Subject code: 140902 **Subject Name: Electrical Power**

Date: 18 / 06 /2010 **Time: 10.30 am – 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.**

Q.1 **(a)** Distinguish between bundle conductor 3- phase line with two conductors per bundle and double circuit 3 – phase line . What differences in electrical characteristic do you expect between the two lines? **07**

(b) Compare (i) radial distribution system (ii) ring or loop distribution system (iii) network or grid distribution system. Also state applications. **04**

(c) Explain string efficiency and methods to improve this for 'insulators'. How are these tested to determine flashover voltage? **03**

Q.2 **(a)** 2 A 3-phase synchronous motor having a mechanical load (including losses) of 122 KW is connected in parallel with a load of 510 KW at .8 p.f lagging. The excitation of the motor is adjusted so that the KVA input to the motor becomes 140 KVA. Determine the new power factor of whole system. **07**

(b) Name the place with reasons where the following conductors are used. **07**
(i) All aluminum conductor (ii) ACSR conductor
(ii) Stay (Guy wire) (iv) GI wire.
Why are stranded conductors used?

OR

(b) Classify the underground cables according to insulation used, voltage rating and number of cores .Sketch a typical 3 – core cable and label the important parts **07**

Q.3 **(a)** Describe with the help of a neat sketch the working of solar power plant. What are its salient features? **07**

(b) Write short note on **07**
(i) Skin effect (ii) Effect of earth on capacitance of transmission line.

OR

Q.3 **(a)** State the essential elements of hydro electric power plant & show them in sketch of such a typical plant **07**

(b) Why is earthing necessary in power system ? How can it be classified? Discuss the various methods of neutral grounding. **07**

Q.4 **(a)** Explain with sketch the working of nuclear power station. Discuss merits and problems associated with nuclear power station. **07**

(b) Write short notes on wind power generation **04**

(c) Discuss the merits & demerits of hydro electric plant **03**

OR

Q.4	**(a)**	Explain the working of (i) open cycle gas turbine (ii) close cycle gas turbine power plants and discuss the advantage and disadvantage of each one of them.	**07**
	(b)	Explain the function of moderator. How is a moderator selected? why does a breeder reactor require no moderator	**04**
	(c)	Explain the principle of impulse turbine and how it differ from reaction turbine	**03**
Q.5	**(a)**	Explain with neat sketch the working of a thermal electric power plant & explain the function of major components in it.	**07**
	(b)	What are the causes of low p.f and give the different methods for its improvement	**07**

OR

Q.5	**(a)**	Draw a neat layout of a 132/33 KV substation having two 132 KV incoming line & four 33 KV out going lines. Show essential equipments in the diagram	**07**
	(b)	What do you understand by combine cycle power plant? What are their salient features? Discuss the popular systems.	**07**

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