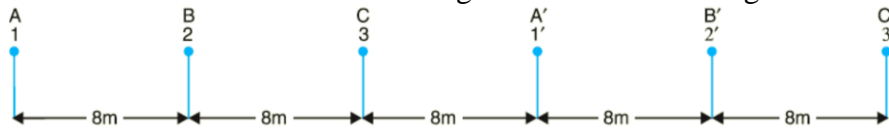


GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV (NEW) EXAMINATION – WINTER 2021****Subject Code:3140914****Date:28/12/2021****Subject Name:Power System- I****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

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) For a steam power station, Describe functions of: Air Pre Heater Cooling Tower Economizer.	03
(B) Explain working principle of solar photovoltaic cell	04
(C) Draw and explain neat schematic arrangement of Hydro power station and discuss function of its constituents.	07
Q.2 (A) Compare AC and DC supply system.	03
(B) What are the factors that affect the sag in transmission line?	04
(C) Develop various components of wind energy conversion system with diagram.	07
OR	
(C) Explain in detail about Synchronous condenser method for power factor improvement.	07
Q.3 (A) Name the important components of an overhead transmission line. Give reasons for unequal potential distribution over a string of suspension insulators.	03
(B) Define and explain string efficiency. Can its value be equal to 100%? Justify your answer.	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.3 (A) Compare the merits and demerits of underground system versus overhead system.	03
(B) What are the properties of insulating material for cables? Name some insulating materials used in cables.	04
(C) What do you understand by grading of underground cables? List the methods of grading and explain any one of them in detail.	07
Q.4 (A) What do you mean by the constants of an overhead transmission line?	03
(B) Derive the equation of Capacitance of a single phase line.	04

- (C) Calculate the inductance per phase per metre for a three-phase double-circuit line whose phase conductors have a radius of 5.3 cm with the horizontal conductor arrangement as shown in Fig. 07



OR

- Q.4** (A) Explain self GMD and mutual GMD. 03
 (B) Derive expression for capacitance for single core cable. 04
 (C) What is electric supply system? Draw a single line diagram of a typical a.c. power supply system. 07

- Q.5** (A) Derive an expression for electric potential at a charged single conductor. 03
 (B) What is the effect of earth on Transmission line capacitance? 04
 (C) Classify the sub-stations according to service requirement and constructional features. Compare outdoor substation and indoor substation 07

OR

- Q.5** (A) Enlist various equipment's used in substation 03
 (B) What is neutral grounding? List the advantages of Neutral grounding. 04
 (C) Explain arc suppression coil earthing in detail. 07

