

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

Subject code: X21901 Subject Name: Electrical Machines and Electronics
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) Explain main parts and working principle of a single phase transformer. (7)
Q-1(b) Describe in details the working principle & construction of D.C. motor. State the classification of D.C. motors. (7)

Q-2(a) Explain the characteristic of D.C. generators. (7)
Q-2(b) Discuss the methods of speed control for D.C. motor (7)

OR

Q-2(b) A short shunt compound D.C. generator supplies a current of 75A at a voltage of 225V. Calculate the generated voltage if the resistance of armature, shunt field and series windings are 0.04Ω , 90Ω and 0.02Ω respectively. (7)

Q-3(a) Describe the no-load test and blocked rotor test on an induction motor. (7)
Q-3(b) Explain capacitor start induction run single phase induction motor. (7)

OR

Q-3(a) What is tariff? Discuss of type of tariff in details. (7)
Q-3(b) State the causes of low power factor and explain the different methods of power factor improvement. (7)

Q-4(a) State and explain different type of substation and list the equipment used in a sub-station. (7)
Q-4(b) Comparison of indoor and outdoor substation. (7)

OR

Q-4(a) Explain the working of an op-amplifier as a non inverting amplifier. Derive the expression for its Voltage gain. (7)
Q-4(b) With the help of neat sketch. Explain the functional block diagram of 8085 microprocessor. (7)

Q-5(a) State and Prove De-Morgan's Theorem. (7)
Q-5(b) With the help of neat sketch show the output characteristics of transistor connected in common emitter, output configuration. Indicate the Active, Cut-Off and Saturation regions (7)

OR

Q-5(a) Explain the AND and OR gates with truth tables. (7)
Q-5(b) Draw the circuit diagram of full wave rectifier. Explain the operation with wave form. (7)
