Q.P. Code: 16EE212 **R16**

Reg. No. | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Regular & Supplementary Examinations May 2019
ELECTRICAL TECHNOLOGY
(Electronics & Communication Engineering)

Time: 3 hours Max. Marks:60

(Answer all Five Units 5 X 12 = 60 Marks)

UNIT-I

1 Enlist the essential parts of a D.C. machine and indicate their functions. 12M

OR

2 **a** Describe the different types of generator. 4M

b A 4-pole DC compound generator has armature, series field and shunt field resistances of 1Ω, 0.5Ω and 100 Ω respectively. This generator delivers 4kW at a terminal voltage of 200V and Allow 1V per brush for contact drop. Calculate the induced e.m.f for both long shunt and Short shunt. 8M

UNIT-II

3 **a** Deduce an expression for torque developed in the armature of DC motor. 6M

b Derive the condition for maximum efficiency of a DC machine. 6M

OR

4 Describe how Swinburne's test is conducted on DC machine. State its advantages and disadvantages. 12M

UNIT-III

5 **a** Derive the EMF equation of a single-phase transformer. 6M

b A 2200/250V transformer takes 0.5A and power factor of 0.3 on open circuit. Find the Magnetizing and working components of no load primary current. Also draw no load phasor diagram. 6M

OR

6 Explain the O.C & S.C tests on single-phase transformer with neat circuit diagram. 12M

UNIT-IV

7 **a** Explain the principle of operation of Induction motor. 7M

b A 6-pole, 50 Hz induction motor has a slip of 2.5%. Find the actual speed and slip speed. 5M

OR

8 **a** Explain the torque slip characteristics of 3-phase induction motor. 6M

b A 50 Hz, 8 pole induction motor has a full load slip of 4%. The rotor resistance and reactance are 0.01Ω and 0.1Ω per phase respectively. Find the ratio of maximum to full load torque and speed at which the maximum torque occurs. 6M

UNIT-V

9 **a** Explain the working principle of an alternator. 6M

b A three phase star connected alternator driven at 750 rpm is required to generate a line voltage of 4000 volts at 50 Hz on open circuit. The slots has 3 slots/pole/phase and 12 conductors/slot. Calculate: i) Number of poles ii) the useful flux per pole. Assume full pitch coil. 6M

OR

10 A 3-phase, 50 Hz, star connected 2000 KVA, 2300V alternator has an effective resistance of 0.12Ω and gives a short circuit current of 600A for a certain field excitation. With the same excitation, the open circuit voltage was 900V. Calculate: i) The synchronous impedance and reactance ii) The full load regulation when the power factor is 0.8 lagging iii) The full load regulation when the power factor is 0.6 leading. 12M

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