Q.P. Code: 16EE220 **R16**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations Feb-2021

ELECTRICAL MACHINES-III

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1 Derive the EMF equation of an Alternator **12M**

OR

2 Calculate the RMS value of induced voltage per phase and line of a 10pole, 3Ø, 50HZ, alternator with 2 slots per pole per phase and 4conductors per slot. If the coil span is 150° electrically. If the flux per pole has a fundamental component of 0.12wb and 20% of 3rd harmonic component. **12M**

UNIT-II

3 Explain the procedure for calculation of voltage regulation of salient pole Alternator and draw the suitable phasor diagram and assumptions. **12 M**

OR

4 A 3-phase star connected synchronous generator supplies a current of 10A having phase angle of 20° Lagging at 400 V. Find the load angle and components of armature current. If X_d =10Ω, X_q=6.5Ω. Assume R_a is neglected. Find the no load EMF and voltage regulation. **12 M**

UNIT-III

5 **a** Define infinite bus bar? Explain synchronization of alternator with infinite bus bar. **6M**

b Necessity of parallel operation of alternators. **6M**

OR

6 What is meant by synchronization of alternators? Discuss any two methods of synchronization of alternator. **12M**

UNIT-IV

7 **a** Write short notes on Synchronous condenser **6M**

b Write short notes on Hunting and elimination of hunting **6M**

OR

8 A 3phase, 330V, star connected synchronous motor has synchronous reactance of 5Ω/phase. The input to the motor is 1000KW at a normal voltage and a line induced emf of 4000V. Calculate the operating power factor and line current. **12 M**

UNIT-V

9 Explain Double field revolving theory. **12M**

OR

10 Briefly discuss about the shaded pole IM with circuit diagram mention their applications. **12M**

*** END ***