

**GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN**

(Autonomous)

(Affiliated to Andhra University, Visakhapatnam)

II B.Tech. - II Semester Regular Examinations, April – 2026**ELECTRICAL MACHINES-2**

[Electrical and Electronics Engineering]

1. All questions carry equal marks
2. Must answer all parts of the question at one place

Time: 3Hrs.**Max Marks: 70****UNIT-I**

1. a. Explain the rotating magnetic field in 3-phase Induction motors [7M]
b. Write the power flow diagram of 3-phase Induction motors [7M]
OR
2. a. Explain the constructional features of 3-phase Induction motors [7M]
b. A 4-pole, 3-phase induction motor operates from a supply whose frequency is 50 Hz. Calculate [7M]
i) The speed at which the magnetic field of the stator is rotating
ii) The speed of the rotor when the slip is 0.04
iii) The frequency of the rotor currents when the slip is 0.03 and
iv) The frequency of the rotor currents at standstill

UNIT-II

3. a. Explain the Torque-slip characteristic of 3-phase Induction motors [7M]
b. Elaborate the Procedure for circle diagram [7M]
OR
4. a. explain the Star-Delta starter of 3-phase Induction motors [7M]
b. Explain the Cascading method of starting of 3-phase Induction motors [7M]

UNIT-III

5. a. Define pitch factor and distribution factor and write their expressions. [7M]
b. A three phase 16-pole alternator has the following data: [7M]
Number of poles:198; Conductors/slot=10(Conductors of each phase are connected in series); coil span=160 electrical degrees; speed of alternator=425rpm; flux/pole=75mwb. Calculate the phase and line voltages.
OR
6. a. Explain the constructional features of a synchronous machine with help of neat diagram. [7M]
b. A 10MVA, 6.6kV, 3-phase star connected alternator has provided O.C.C and [7M]

S.C.C test results as shown in table below

I(A)	25	50	75	100	125	150	175	200	225
Line EMF(kV)	2.4	4.8	6.1	7.1	7.6	7.9	8.3	8.5	8.7
SC Current(A)	288	582	875						

Calculate full load voltage regulation at 0.8p.f. leading using synchronous impedance method, the armature resistance $R_a = 0.13\Omega$

UNIT-IV

7. a. Explain the all dark method of Synchronization method. [7M]
b. The following two synchronous machines are operating in parallel [7M]
Machine A: 50MW 6% speed regulation
Machine B : 50MW 3% speed regulation
i) Determine the load taken by each machine for a total load of 80MW when the speed
changers are set to give rated speed at 100% rated output
OR
8. a. What is hunting and How can be controlled. [7M]
b. Why synchronous motor is not inherently self starting and write the starting methods
briefly. [7M]

UNIT-V

9. a. Explain Double field revolving theory [7M]
b. Explain the construction and working of Shaded pole motors [7M]
OR
10. a. Why 1-phase induction motor is not inherently self starting and write the split phase method
briefly [7M]
b. Explain the construction and working of Capacitor start induction motors [7M]