

Reg. No: 

--	--	--	--	--	--	--	--	--	--

SIDDHARTH INSTITUTE OF ENGINEERING &amp; TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations March-2021

ELECTRICAL MACHINES-II

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 60

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

**UNIT-I**

- 1 a Explain the principle of operation of a transformer. 6M  
b Derive the e. m. f. equation of a transformer. 6M

OR

- 2 a What is an ideal transformer? Also explain the operation of an ideal single phase transformer under no load condition. 6M  
b An ideal 25KVA transformer has 500 turns on the primary winding and 40 turns on the secondary winding. The primary is connected to 3000V, 50HZ supply. Calculate (i) primary and secondary currents at full load (ii) secondary emf and (iii) the maximum core flux. 6M

**UNIT-II**

- 3 a Compare a Two-winding transformer with Auto transformer in detail. 8M  
b Draw the equivalent circuit of an Auto transformer. 4M

OR

- 4 a Explain the procedure for conducting Separation of losses test along with all precautions to be taken while Conducting the test with neat diagram. 7M  
b A 40KVA transformer has iron loss of 450W and full load copper loss of 850W. If the power factor of the load is 0.8 lagging. Calculate (i) Full load efficiency (ii) the load at which maximum efficiency occurs and (iii) maximum efficiency. 5M

**UNIT-III**

- 5 a Describe the constructional details of cage and wound rotor induction machines. 6M  
b A three phase induction motor is wound for 4 poles and is supplied from 50 HZ System. Calculate (a) synchronous speed (b) speed of the motor when slip is 4% and (c) Rotor current frequency when the motor runs at 600rpm. 6M

OR

- 6 a Explain how rotating magnetic field of constant amplitude is produced in an Induction Motor. 6M  
b Draw the Connection diagram of open delta connected three-phase transformer. 6M

**UNIT-IV**

- 7 a Explain the Torque-Slip and Torque Speed characteristics of an 3-phase Induction motor. 6M  
b A 50HZ, 8 pole induction motor has full load slip of 4%. The rotor resistance and standstill reactance are  $0.01\Omega$  and  $0.1\Omega$  per phase respectively. Find (i) the speed at which maximum torque occurs (ii) the ratio of the ratio of maximum torque to full load torque. 6M

OR

- 8 a Explain no load tests and blocked rotor tests for an 3-phase induction motor. 6M  
 b Explain various losses in an induction motor and draw power flow diagram. 6M

## UNIT-V

- 9 a Briefly explain the working of star delta starter with a neat diagram. 6M  
 b A 4 pole , 50Hz, 3 phase induction motor has rotor resistance of  $0.2\Omega$  per phase and rotor stand still reactance of  $1\Omega$  per phase. On full load it is running with a slip of 4%, calculate the extra resistance required in the rotor circuit per phase to reduce the speed to 1260 r.p.m, on the same load condition. 6M

OR

- 10 a List out the types of starters used for starting of 3 – phase induction motors. Explain line starting of an induction motor. 6M  
 b Explain in detail about the working of rotor rheostat starter with a suitable diagram. 6M

\*\*\* END \*\*\*