SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations July-2021
ELECTRICAL MACHINES-II
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 60

PART-A
(Answer all the Questions **5 x 2 = 10** Marks)

1	a	Why a 3-phase synchronous motor will always run at synchronous speed?	2M
	b	What is the relation between electrical degree and mechanical degree?	2M
	c	Why are alternators rated in kVA and not in kW?	2M
	d	Can we add extra resistance in series with squirrel cage rotor, Why?	2M
	e	The voltage per turn of a 500KVA, 11KV, Δ/Y three phase transformer is 8.7V calculate the number of turns per phase of LV and HV winding.	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	Why hysteresis and eddy current looses occur in a transformer, Describe in detail.	5M
	b	With neat diagram, Describe the procedure for conducting Sumpner's test along with all precautions to be taken.	5M

OR

3	a	In a 25kVA, 2/0.2 kV, 1 ph. Transformer has iron and full-load copper losses are 350W & 400W respectively. Calculate the efficiency at unity PF. i. full load ii. Half full-load.	5M
	b	Describe the load shared by the transformer when two transformers are connected in parallel.	5M

UNIT-II

4	a	With neat sketches, describe the constructional details of cage rotor of 3-ph. with neat sketches.	5M
	b	Derive Torque equation of 3-phase induction motor	5M

OR

5	a	Draw and explain the Torque-Slip Characteristics of a three-phase induction motor.	5M
	b	Explain various losses in an induction motor and draw power flow diagram.	5M

UNIT-III

6	Explain the following methods of starting of 3-phase induction motor with neat diagrams.
	    i. Star-delta starter[3M]
	    ii. Rotor resistance starter[4M]
		10M

OR

7	A 3-phase,400V induction motor gave the following test readings: No-load : 400V,1250W,9A Blocked rotor test : 150V,4kW,38A Draw the circle diagram. If the normal rating is 14.9kW, find from the circle diagram, the full-load value of current, power factor and slip.	10M

UNIT-IV

8   a   Explain the constructional features of synchronous generator with neat sketches.   **7M**

      b   List the various types' synchronous machines with neat diagrams.   **3M**

OR

9   a   With neat circuit diagram, describe the steps involved to find Xd and Xq from Slip Test.   **5M**

      b   3-phase, 16 pole alternator has a star connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.03 Wb, sinusoidaly distributed and the speed is 375 rpm. Find the frequency and induced emf. Assume full-pitched coil.   **5M**

UNIT-V

10   a   Elucidate the necessity conditions needed for parallel operation of alternators. Also, discuss the load share procedures in two alternators.   **5M**

       b   Compare between synchronous motor and 3Ø induction motor   **5M**

OR

11   a   Describe the working principle and operation of synchronous motor with neat diagram.   **5M**

       b   Define infinite bus bar. Explain synchronization of alternator with infinite bus bar.   **5M**

END