Hall Ticket Number:

Code No. : 14315 N/O

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (EEE: CBCS) IV-Semester Main & Backlog Examinations, May-2019

Electrical Machines-II

Time: **3** hours Max. Marks: **60**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Q.No.	Stem of the question	M	L	CO	PO
	Part-A (10 × 2 = 20 Marks)				
1.	Write different types of three phase induction motors based on their rotor and which type produces more starting torque?	2	2	1	1,2,3,5,7
2.	Draw per phase equivalent circuit of three phase induction motor with load.	2	1	2	1,2,3,5,7
3.	Why starters are used to start 3-phase induction motor.	2	3	1	1,2,3,5,7
4.	List out the methods of speed control of squirrel cage induction motors.	2	4	2	1,2,3,5,7
5.	Distinguish between salient pole and cylindrical rotor type synchronous machines.	2	2	3	1,2,3,5,7
6.	Write different conditions for parallel operation of alternators.	2	1	4	1,2,3,5,7
7.	Write different methods of starting of synchronous motor.	2	1	3	1,2,3,5,7
8.	What are the causes of hunting in synchronous machine?	2	2	3	1,2,3,5,7
9.	Why single phase induction motor is not a self starting motor?	2	2	5	1,2,3,5,7
10.	Write different split phase methods in single phase induction motors.	2	1	5	1,2,3,5,7
	Part-B (5 ×8 = 40 Marks)				
11.a)	Explain about rotating magnetic field in three phase induction motor.	4	3	2	1,2,3,5,7
b)	A 3-phase, 6-pole, 50-Hz induction motor has a slip of 1% at no –load and 3% at full –load. Find: i) Synchronous speed, (ii) No –load speed, (iii) Full –load speed, (iv) Frequency of rotor current at standstill, and (v) Frequency of rotor current at full –load.	4	3	2	1,2,3,5,7
12. a)	Describe with the help of an appropriate diagram, the star-delta method of starting of 3-phase induction motor.	3	2	1	1,2,3,5,7
b)	Draw the circle diagram for a 3-phase, 6-pole, 50Hz, 400V, star-connected induction motor from the following test (line values): No-load test : 400V 9A 1250 Watts Blocked rotor test : 200V 50A 6930 Watts The Stator loss at standstill is 55% of total copper losses and full-load current is 32A. From circle diagram determine i) pf. at full load and ii) Maximum power Input.	5	2	3	1,2,3,5,7
13. a)	Explain three dark lamp method of synchronizing alternator to bus bar.	4	3	4	1,2,3,5,7
b)	A 3-phase, 8-pole, 750 r.p.m synchronous alternator has 72 slots. Each slot has 12 conductors and winding is short pitched by 2 slots. Find pitch factor and breadth factor. If flux per pole is 0.06 wb. Find induced emf per phase.	4	5	4	1,2,3,5,7
14. a)	Explain why the pointers of ammeter and voltmeter swing during the slip test?	4	5	3	1,2,3,5,7
b)	Explain various starting methods for a synchronous motor.	4	2	3	1,2,3,5,7

Contd...2

15.a)	Show that a single phase winding when excited by a single phase supply produce two equal and opposite revolving fields.	4	3	5	1,2,3,5,7
b)	Describe the construction and principle of operation of 1-phase split-phase induction motor	4	2	5	1,2,3,5,7
16.a)	Distinguish between squirrel cage and wound rotor induction motors. Also list their applications.	4	2	2	1,2,3,5,7
b)	Explain double cage induction motor with neat diagram.	4	2	2	1,2,3,5,7
17.	Answer any ***two*** of the following:				
a)	A 220V, 50 Hz, 6-pole star-connected alternator with ohmic resistance of 0.06 ohm per phase, gave the following data for open-circuit, short-circuit characteristics:	4	3	4	1,2,3,5,7

Field current, A	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.8	2.2	2.6	3.0	3.4
Ef in V	29	58	87	116	146	172	194	232	261	284	300	310
Isc in A	6.6	13.2	20	26.5	32.4	40	46.3	59	--	--	--	--

Find the percentage voltage regulation at full load current of 40 amps, power factor of 0.8 lag by e.m.f method.

b)	What is a synchronous condenser? Explain its operation.	4	2	4	1,2,3,5,7
c)	Explain split-phase starting methods of 1-phase induction motor.	4	2	5	1,2,3,5,7

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	60
2	Knowledge on application and analysis (Level-3 & 4)	30
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	10