

Reg. No.

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B.E. / B.TECH. DEGREE EXAMINATIONS, DEC 2019

Fourth Semester

EE16402 – ELECTRICAL MACHINES - II*(Electrical and Electronics Engineering)***(Regulation 2016)****Time: Three Hours****Maximum : 100 Marks**

Answer ALL questions

PART A - (10 X 2 = 20 Marks)

		CO	RBT
1.	Draw the equivalent circuit of three phase induction motor and mention the parameters?	1	U
2.	What is the advantage of double cage induction motor?	1	R
3.	Is it possible to inserting an additional resistance in rotor circuit of a slip ring induction motor? If, yes give the reason.	2	AP
4.	What is regenerative braking in three phase induction motor?	2	U
5.	What is the purpose of capacitor in a single-phase induction motor?	3	R
6.	What is the use of shading ring in a pole motor?	3	R
7.	State the relation between electrical degree and mechanical degree?	4	U
8.	What are the causes of changes in voltage of alternators when loaded?	4	AN
9.	Why the synchronous motor always rotate at synchronous speed?	5	R
10.	What are the causes of hunting in a synchronous motor?	5	AN

PART B - (5 X16 = 80 Marks)

11. (a) (i) Derive the starting and maximum torque of three phase induction motor. Draw the torque slip characteristics and mention the starting and maximum torque. **(12)** **1** **AP**
- (ii) Write short notes on crawling. **(4)** **1** **R**
- (OR)**
- (b) (i) Why the induction motor efficiency is less compare to transformer? Justify your answer. **(4)** **1** **AN**
- (ii) The real power input to a 415V, 50Hz, 4 pole, 3 phase induction motor running at 1470 rpm is 41kW. The input power factor is **(12)** **1** **AN**

0.9. The stator losses amount to 1.1kW and the mechanical losses total 1.2kW. Calculate the line current, synchronous speed, slip, rotor copper loss, mechanical power output and efficiency.

12. (a) Why starters are necessary for starting three phase induction motors? (16) 2 R
 Explain any one starter for cage induction motor and one starter for wound motor with relevant diagram.
- (OR)**
- (b) What is slip power? Explain the slip power recovery schemes as applied to wound rotor induction motor with neat diagram. (16) 2 R
13. (a) Explain with neat diagram the double field revolving theory for operation of single phase induction motor. (16) 3 U
- (OR)**
- (b) (i) Explain with neat sketch the constructional details, principle of operation of split phase induction motor. (10) 3 R
 (ii) Explain the principle of operation of capacitor start single phase induction motor. (6) 3 R
14. (a) (i) Derive from first principle, the EMF equation of three phase alternator with the relevant winding factors. (10) 4 R
 (ii) Briefly explain any one method of synchronizing the three phase alternator to the infinite bus with neat diagram. (6) 4 R
- (OR)**
- (b) (i) Describe the ASA method of determining the regulation of an alternator. (10) 4 AP
 (ii) Explain the effect of change in excitation in an alternator. (6) 4 AN
15. (a) (i) Explain the principle of operation of three phase synchronous motor with neat diagram. (6) 5 R
 (ii) Why synchronous motors are not self-starting? Explain any one method of starting of synchronous motor. (10) 5 R
- (OR)**
- (b) Draw the V- and inverted V-curves for various load conditions and explain the effect of excitation on armature current and power factor of synchronous motor. (16) 5 U