A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 54302

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2022

Fourth Semester

Electrical and Electronics Engineering

15UEE402- AC MACHINES

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The frame of an induction motor is usually made of CO1- R

   (a) Silicon steel (b) Cast iron (c) Aluminum (d) Bronze

2. A 3-phase 440 V, 50 Hz induction motor has 4% slip. The frequency of rotor current will be CO1- R

   (a) 50 Hz (b) 25 Hz (c) 5 Hz (d) 2 Hz

3. For starting of an induction motor, star/delta starting can be considered equivalent to an autotransformer starter with the ratio of CO2- R

   (a) 33.3% (b) 50% (c) 100% (d) 57.7%

4. Rotor resistance speed control method is not applicable in CO2- R

   (a) Slip Ring induction motor (b) Squirrel cage induction motor

   (c) Synchronous motor (d) None of the above

5. The main reason for voltage drop in an alternator is CO3- R

   (a) Armature resistance (b) Synchronous Reactance

   (c) Armature Reactance (d) All of the above

6. The maximum power in a synchronous machine is obtained when the load angle is CO3- R

   (a) 0 degree (b) 120 degree (c) 90 degree (d) 45 degree

7. The speed regulation of a synchronous motor is CO4- R

(a) 100% (b) 50% (c) 25% (d) 0%

8. For a synchronous motor, the breakdown torque will be proportional to CO4- R

(a) Applied voltage V (b) V^2 (c) 1/V (d) $1/V^2$

9. The motor used for the compressors is CO5- R

(a) Reluctance motor (b) Shaded pole motor

(c) DC series motor (d) Capacitor start-capacitor run motor

10. Which of the following motor is used in the mixer? CO5- R

(a) Repulsion Motor (b) Reluctance Motor

(c) Hysteresis Motor (d) Universal Motor

PART – B (5 x 2= 10 Marks)

11. Define slip of the Induction motor. CO1 R

12. Classify the types of starters in three phase induction motor. CO2 R

13. Compare salient pole rotor and cylindrical pole rotor. CO3 R

14. What is Synchronous capacitor? CO4 R

15. What is universal motor? CO5 R

PART – C (5 x 16= 80 Marks)

16. (a) (i) Explain the construction and working principle of a 3-phase Induction motor. CO1- U (8)

(ii) Explain Torque – Slip characteristics of three phase induction motor. CO1- U (8)

Or

(b) Explain the construction and performance of CO1- U (8)

(i) Double cage rotor

(ii) Induction generator CO1- U (8)

17. (a) Describe with neat diagram the principle of working of a star – delta starter in three phase Induction motor. CO2- U (16)

Or

(b) Explain any two speed control method of 3phase induction motor. CO2- U (16)

18.	(a)	Explain any one method of predetermine the regulation of an alternator.	CO3- U	(16)
		Or		
	(b)	Explain Blondel's two reaction theory.	CO3- U	(16)
19.	(a)	Explain the methods of starting the Synchronous motor.	CO4- U	(16)
		Or		
	(b)	Derive the expression for power developed by a synchronous motor with phasor diagram in terms of load angle.	CO4- U	(16)
20.	(a)	Explain the Double field revolving theory of operation of single phase induction motor.	CO5- U	(16)
		Or		
	(b)	Explain construction, working , characteristics and applications of	CO5- U	(8)
		(i) Hysteresis motor		
		(ii) Reluctance motor	CO5- U	(8)

54302