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

Question Paper Code: 53323

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Third Semester

Mechanical Engineering

15UEE323 - ELECTRICAL MACHINES

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The induced e.m.f in the armature conductors of a d.c. motor is CO1- R

   (a) Sinusoidal (b) Trapezoidal (c) Rectangular (d) Alternating

2. Which of the following rule is used to determine the direction of rotation of D.C motor? CO1- R

   (a) Coulomb's Law (b) Lenz's Law

   (c)Fleming's Right-hand Rule (d) Fleming's Left-hand Rule

3. A transformer transforms CO2- R

   (a) Frequency (b) Voltage (c) Current (d) Power

4. In performing the short circuit test of a transformer CO2- R

   (a) High voltage side is usually short circuited (b) Low voltage is usually short circuited

   (c) Any side is short circuited with preference (d) None of the above

5. In induction motor, greater the number of poles CO3- R

   (a) Lesser the speed (b) Greater the speed

   (c) Lesser the frequency (d) All of these

6. The shaft of an induction motor is made of CO3- R

(a) Stainless steel (b) Carbon steel (c) Cast iron (d) Aluminum

7. Alternator works on the principle of CO4- R

(a) Self and mutual induction (b) Self induction

(c) Faraday's law of electromagnetic induction (d) Mutual induction

8. The damper winding in a synchronous motor is generally used CO4- R

(a) To provide starting torque only (b) To reduce noise level

(c) To reduce eddy currents (d) To prevent hunting and provide the starting torque

9. An unexcited single phase synchronous motor is CO5- R

(a) Reluctance motor (b) Repulsion motor (c) Universal motor (d) AC series motor

10. A capacitor start, capacitor run single phase induction motor is basically a CO5- R

(a) Ac series motor (b) Dc series motor

(c) 2 phase induction motor (d) 3 phase induction motor

PART – B (5 x 2= 10Marks)

11. What are the functions of yoke in a DC machine? CO1- R

12. Differentiate shell type and core type transformer. CO2- R

13. Define slip. CO3- R

14. Write the EMF equation of alternators. CO4- R

15. Classify single phase induction motors. CO5- R

PART – C (5 x 16= 80Marks)

16. (a) (i) Derive the EMF equation of the DC machine. CO1- App (8)

(ii) Explain the constructional details of DC machine with neat sketch. CO1- U (8)

Or

(b) Draw and Explain the working of three point starter of DC motor. CO1-U (16)

17.	(a)	Discuss the construction and principle of operation of transformer.	CO2- U	(16)
		Or		
	(b)	Derive the equivalent circuit of transformer with relevant diagram.	CO2- App	(16)
18.	(a)	(i) Explain the principle of operation of three phase induction motor.	CO3- U	(8)
		(ii) Derive the torque equation of three phase induction motor.	CO3- App	(8)
		Or		
	(b)	Explain the operation of auto- transformer starter and star-delta starter of three phase induction motor with a neat diagram.	CO3- U	(16)
19.	(a)	Derive the EMF induced in the alternator.	CO4- App	(16)
		Or		
	(b)	Explain starting methods of synchronous motor with its necessary diagram.	CO4-U	(16)
20.	(a)	Discuss any two types of single phase induction motors with diagram.	CO5-U	(16)
		Or		
	(b)	Explain the following special machines with neat sketch.	CO6- U	(16)
		(i) Hysteresis Motor		
		(ii) Switched reluctance motor		