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

Question Paper Code: 54326

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

Fourth Semester

Electronics and Communication Engineering

15UEE426- PRINCIPLE OF ELECTRICAL MACHINES

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Fleming's right hand rule is applicable to _____. CO1- R

   (a) Transformer (b) DC generator (c) DC motor (d) Alternator

2. Which of the following load would be best driven by a DC compound motor? CO1- R

   (a) Reciprocating pump (b) Centrifugal pump

   (c) Electric Locomotive (d) Fan

3. A transformer transfers _____. CO2- R

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

4. The main purpose of using core in a transformer is to _____. CO2- R

   (a) Decrease iron losses

   (b) Prevent eddy current loss

   (c) Eliminate magnetic hysteresis

   (d) Decrease reluctance of the common magnetic circuit

5. The frame of an induction motor is made by _____. CO3- R

(a) aluminium (b) silicon steel

(c) closed grained cast iron (d) bronze

6. The starting torque of a squirrel cage induction motor is _____. CO3- R

(a) very large (b) very low

(c) slightly more than full load torque (d) zero

7. _____ Motor is usually employed in motor-generator sets. CO4- R

(a) Squirrel cage induction (b) Slip-ring induction

(c) Synchronous (d) Commutator

8. While starting a synchronous motor its field winding should be CO4- R

(a) kept open (b) short-circuited

(c) connected to a dc source (d) none of the above

9. The wattage rating for a ceiling motor will be in the range_____. CO5- R

(a) 50 to 250 W (b) 250 TO 500 W (c) 50 TO 150 W (d) 10 TO 20 W

10. Stepper motors are mostly used for _____. CO5- R

(a) High power requirements (b) Control system applications

(c) Very high speed of operation (d) Very low speed of operation

PART – B (5 x 2= 10Marks)

11. What is the function of no-voltage release coil in D.C. motor starter? CO1- R

12. Mention the difference between core and shell type transformers. CO2- U

13. Draw the slip-torque characteristics of a three phase induction motor. CO3- U

14. What is hunting? CO4- R

15. Why single phase induction motor is not self starting? CO5- U

PART – C (5 x 16= 80Marks)

16. (a) (i) Explain the construction and working principle of DC generator with neat diagram. CO1- U (10)

(ii) Derive an EMF equation of DC generator. CO1- App (6)

Or

	(b)	(i) Develop the torque equation of a DC motor.	CO1- App	(6)
		(ii) Explain with neat diagram, the working of three point starter for a DC motor.	CO1- U	(10)
17.	(a)	(i) Explain the working principle of transformer.	CO2- U	(8)
		(ii) Derive an EMF equation of a transformer and specify their parameters.	CO2- U	(8)

Or

	(b)	(i) Draw and explain the approximate equivalent circuit of transformer referred to primary winding.	CO2-U	(6)
		(ii) Explain the different types of three phase transformer Connections with their voltages and currents.	CO2-U	(10)
18.	(a)	Explain the construction and principle of operation of three phase induction motor. Distinguish between squirrel cage rotor and slip ring rotor.	CO3- Ana	(16)

Or

	(b)	(i) Explain with the help of a neat diagram, the working of a star-delta starter for an induction motor.	CO3- Ana	(10)
		(ii) Derive the condition for maximum torque and obtain maximum torque.	CO3- Ana	(6)
19.	(a)	(i) Explain the construction of an alternator.	CO4- U	(6)
		(ii) Draw and explain the vector diagram of an alternator when it is loaded with 1. UPF 2. Lagging PF 3.Leadiing PF	CO4- U	(10)

Or

	(b)	Describe about any two method of starting a synchronous motor.	CO4- Ana	(16)

20.	(a)	What are the types of single phase induction motor? Explain any two in detail.	CO5- U	(16)
		Or		
	(b)	(i) Explain the construction and working of permanent magnet synchronous motor.	CO5- U	(8)
		(ii) Explain the construction and working of switched reluctance motor.	CO5- U	(8)