Reg. No. : | | | | | | | | | | |

Question Paper Code: 53302

B.E./B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Electrical and Electronics Engineering

15UEE302 - DC MACHINES AND TRANSFORMERS

(Regulation 2015)

Duration: One hour Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Permanent magnets are normally made of CO1- R

   (a) Alnico alloys (b) Aluminum (c) Cast Iron (d) Wrought Iron

2. Energy stored by a coil is doubled when its current is increased by present. CO1- R

   (a) 25 (b) 50 (c) 41.4 (d) 100

3. A transformer core is laminated to reduce CO2- R

   (a) Hysteresis loss (b) Eddy current loss

   (c) Copper loss (d) All the above losses

4. A transformer cannot raise or lower the voltage of DC supply because CO2- R

   (a) More losses in DC (b) No windage losses

   (c) Rate of change of flux is zero (d) Static device

5. An electro-mechanical energy conversion device is one which converts _____ CO3- R

   (a) Electrical energy to mechanical energy only

   (b) Mechanical energy to electrical energy only

   (c) All of the mentioned

   (d) None of the mentioned

6. What is the coupling field used between the electrical and mechanical systems in an energy conversion devices? CO3- R

(a) Magnetic field (b) Electric field

(c) Magnetic field or Electric field (d) None of the mentioned

7. Which of the following law can be used to determine the direction of rotation of DC Generator? CO4- R

(a) Lenz law (b) Faradays law

(c) Flemings left hand rule (d) Flemings right hand rule

8. In a DC generator, the current to the external circuit is given through CO4- R

(a) Commutator (b) Armature winding (c) Solid connection (d) Field winding

9. A DC series motor is that which CO5- R

(a) has its fields winding consisting of thick wire and less turns

(b) has poor torque

(c) can be started easily without load

(d) almost constant speed

10. When the motor runs on no load, then CO5- R

(a) Back emf is almost equal to applied voltage

(b) Back emf will be less than applied voltage

(c) Back emf will be greater than applied voltage

(d) None of these

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Derive the relation between mutual inductance and self inductances of two Magnetically coupled coils. CO1- U (8)

12. Elaborate in detail about the sumpner's test conducted in transformers. CO2- U (8)

13. A steel ring has a mean diameter of 20cm, a cross section of 25cm^2 and a radial air – gap of 0.8mm cut across it. When excited by a current of 1A through a coil of 1000 turns wound o the ring core, it produces an air-gap flux of 1mWb. Neglecting leakage and fringing. Calculate CO3- U (8)

(i) Relative permeability of steel

14.	Sketch the construction of DC Generator and explain about various parts associated with it.	CO4- U	(8)
15.	Narrate with the construction styles of DC motor types and explain in detail.	CO5- U	(8)