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Question Paper Code: 53302

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2019

Third Semester

Electrical and Electronics Engineering

15UEE302 - DC MACHINES AND TRANSFORMERS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Now a day's Magnets are made of CO1- R
(a) Iron (b) Steel (c) both a and b (d) Copper
- _____ is defined as fraction of the total flux produced by one coil CO1- R
linking the other coil.
(a) Flux coupling (b) Electric coupling (c) Magnetic coupling (d) link coupling
- The principle of operation of transformer is based on CO2-U
_____ electromagnetic induction.
(a) Ohm's Law (b) Faraday's Law (c) Ampere's Law (d) Tesla
- The transformer ratings are usually expressed in CO2- U
(a) Volts (b) Amperes (c) Kw (d) KVA
- The electrical energy given to the coil is stored in the form of CO3- U
magnetic energy is known as
(a) Electrical energy (b) Co energy (c) Magnetic energy (d) Field energy
- The distance between the centers of two adjacent poles CO3- R
(a) Pole pitch (b) Chording (c) Chording angle (d) All of above
- _____ converts the alternating emf generated in the armature CO4- R
winding into dc voltage across the brushes in DC generator.
(a) Rectifier (b) Commutator (c) Converter (d) None of these

8. An exciter for a turbo generator is a CO4- R
- (a) Separately excited generator (b) Shunt generator
- (c) Series generator (d) Compound generator
9. $V = E_b + I_a R_a$ is called _____ equation of DC CO5- R
motor
- (a) Voltage (b) Current (c) Power (d) None of these
10. What will happen, with the increase in speed of a DC motor? CO5- R
- (a) Back emf increase but line current falls.
- (b) Back emf falls and line current increase.
- (c) Both back emf as well as line current increase.
- (d) Both back emf as well as line current fall

PART – B (5 x 2= 10Marks)

11. State Faradays law of electromagnetic induction. CO1- R
12. Distinguish Power Transformers and Distribution Transformers? CO2- R
13. What is the significance of Co Energy? CO3- R
14. What is the purpose of yoke in D.C machine? CO4- R
15. What is Back EMF in D.C. motor? CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Explain the core loss that occurs in magnetic circuits in detail. CO1- U (16)
- Or
- (b) (i) Brief about magnetic materials and their properties. CO1- U (10)
- (ii) Write a brief note on permanent magnets. CO1- U (6)
17. (a) Explain the working and construction of Auto Transformer in CO2-App (16)
detail?
- Or
- (b) Brief the following topics relevant to transformer:
- (i) Polarity test CO2-U (4)
- (ii) Open circuit and short circuit test CO2-U (6)
- (iii) Parallel operation of transformer CO2-U (6)

18. (a) (i) Derive an expression for field energy and mechanical force. CO3 U (8)
(ii) Brief about multiply excited magnetic field systems with an example. CO3 U (8)
- Or
- (b) Derive the Torque equation of round rotor machine or AC Machines? CO3- Ana (16)
19. (a) (i) Derive the emf equation for DC generator. CO4- App (4)
(ii) Describe the process of commutation in DC generator. CO4- U (12)
- Or
- (b) Explain in about detail about commutation of D.C machines? CO4- U (16)
20. (a) Explain in detail about the Characteristics of DC motors. CO5- U (16)
- Or
- (b) Explain the method of testing DC machines by Swinburne and Hopkinson's test. CO5- U (16)

