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Question Paper Code: 31337

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Third Semester

Electronics and Communication Engineering

01UEE323 - ELECTRICAL MACHINES

(Common to Instrumentation and Control Engineering and Mechanical Engineering)

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Write down the EMF equation of a single phase transformer.
2. Why is the rating of transformer given in KVA?
3. Define the term synchronous speed.
4. What are the assumptions are made for deriving the torque equation?
5. Why Number of Stator and Rotor Poles be same?
6. What is the function of carbon brush used in DC generator?
7. Name three things required for generation of EMF.
8. What is the significance effect of back EMF?
9. What are the factors that govern controlling of motor speed?
10. A four pole DC motor takes an armature current of 150A at 440v. If its armature circuit has a resistance of 0.15ohm , what will be the back emf at this load?

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Explain the speed control methods in DC machines. (10)

(ii) Derive the torque equation of a DC motor? (6)

Or

(b) Explain the constructional detail of DC machine with a neat diagram. (16)

12. (a) Explain the construction and working principle of a transformer. (16)

Or

(b) Explain parallel operation of single phase transformer and derive the emf equation of transformers. (16)

13. (a) Describe the constructional features of both squirrel cage induction motor and slip ring induction motor. Discuss the merits one over another. (16)

Or

(b) (i) Derive the torque equation of 3-phase induction motor and deduce condition for maximum torque. (10)

(ii) Explain torque-slip characteristics of 3-phase induction motor. (6)

14. (a) Explain the EMF method to determine the voltage regulation of an alternator. (16)

Or

(b) Briefly explain the construction and working principle of synchronous motor. (16)

15. (a) Briefly explain the working principle of capacitor start capacitor run induction motors. (16)

Or

(b) Write short note on:

(i) Switched reluctance motor. (8)

(ii) Brushless DC motor. (8)