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Question Paper Code: 33323

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

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. What is back EMF in a D.C. motor?
2. Define armature reaction.
3. What is the function of breather in transformer?
4. Why is transformer rated in KVA?
5. What happens if the air gap flux density in an Induction motor increases?
6. Why an induction motor is called rotating transformer?
7. Define voltage regulation of an alternator.
8. Define voltage regulation of an alternator.
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) With neat diagram explain the working of 3 point starter. (16)

Or

(b) Discuss about the various performance characteristics of DC shunt and series motor. (16)

12. (a) Explain the construction details and working of core type transformer with neat sketches. (16)

Or

(b) Develop an equation for induced EMF in a transformer winding in terms of flux and frequency. (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) Derive an expression for the torque of an induction motor and obtain the condition for maximum torque. (16)

14. (a) Describe the various methods of starting the synchronous motor. (16)

Or

(b) (i) Explain the phenomena of hunting in synchronous motors and the methods adopted to minimize the effect of hunting. (8)

(ii) Explain with circuit any one method of starting a three phase synchronous motor. (8)

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

Or

(b) Explain the following with neat diagram

(i) Hysteresis motor (8)

(ii) Brushless DC motor (8)