Reg. No. :

Question Paper Code: 33323

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

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 the necessity of starter in a D.C. motor?

2. What is the function of commutator in D.C. generator?

3. Mention the difference between core and shell type transformers?

4. Why is the rating of transformer given in KVA?

5. What happens if the air gap flux density in an Induction motor increases?

6. What are the advantages of three phase induction motor?

7. Define voltage regulation of an alternator.

8. Define voltage regulation of an alternator.

9. What is a universal motor?

10. What are the applications of stepper motors?

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Derive the EMF equation of a D.C. Generator.   (8)

    (ii) Draw and explain about the separately excited and self excited D.C. generator and also write the relevant current and voltage equations .   (8)

Or

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

12. (a) Derive and explain the equivalent circuit of a transformer with neat sketch.   (16)

Or

    (b) Develop an equation for induced EMF in a transformer winding in terms of flux and frequency.   (16)

13. (a) (i) Describe the principle of operation of a 3 phase induction motor.   (8)

    (ii) Derive the torque equation for a three phase induction motor.   (8)

Or

    (b) Derive an expression for the torque of an induction motor and obtain the condition for maximum torque.   (16)

14. (a) (i) Explain clearly the MMF method of determining the regulation of an alternator.   (8)

    (ii) State and explain the conditions for parallel operation and synchronism of an alternator.   (8)

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)

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15. (a) Explain the double field revolving theory for operation of single phase induction motor. (16)

Or

(b) Explain the following with neat diagram

(i) Hysteresis motor (8)

(ii) Brushless DC motor (8)

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