Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(EE) (2018 Batch) (Sem.–3)

ELECTRICAL MACHINES-I

Subject Code : BTEE-302-18

M.Code : 76383

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Write briefly :

1. Which material is suitable for making permanent magnet? Give reason.
2. Why laminated core in electrical machines are used?
3. While comparing magnetic and electric circuit, the flux of magnetic circuit is compared with which parameter of the electric circuit.
4. What are the materials used for brushes in dc machines? Also give reason.
5. What is purpose of field winding in DC machines?
6. Define back emf in DC motor.
7. How the effect of armature reaction in DC machine is minimised?
8. Why DC series motor should not be started without load, explain.
9. Why transformer is rated in KVA.
10. Draw the phasor diagram of single phase transformer on no load.

SECTION-B

11. The armature resistance of a 200 V shunt motor is 0.4 Ω and no-load current is 2 A. When loaded and taking an armature current of 50 A, the speed is 1200 rpm. Find approximately the no-load speed.

12. Discuss the open circuit characteristics of separately excited DC generator with suitable diagram.

13. A coil of 100 turns is wound uniformly over a wooden ring. The ring is having a mean circumference of 500 mm and a uniform cross-section area of 400 mm^2. A current of 4 A passed through the coil. Calculate :

    a) Magnetic field strength

    b) Flux density

    c) Total flux.

14. Explain the principle of operation of dc machine. Derive the expression for the back emf in a dc motor. Briefly explain the role it plays in starting and running of the motor.

15. Explain the on load operation of single phase practical transformer.

SECTION-C

16. Two DC shunt generators are connected in parallel to supply a load of 5000 A. Each machine has an armature resistance of 0.03 Ω and field resistance of 60 Ω but the emf of one machine is 600V and that of the other machine is 640 V. What power does each machine supply?

17. The emf per turn for a single phase, 2310/220 V, 50 Hz, transformer is approximately 13 Volts.

    Calculate :

    a) The number of primary and secondary turns.

    b) The net cross-sectional area of the core, for a maximum flux density of 1.4T.

18. With suitable circuit diagram, explain open circuit test and short circuit test on single phase transformer.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.