



Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Electronics & Electrical Engg.)
(Sem.-3)

TRANSFORMERS AND DIRECT CURRENT MACHINES

Subject Code : BTEE-302 M.Code : 57093

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION 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

1. Answer briefly :
 - A. What do you mean by voltage regulation? Explain.
 - B. Why is it preferable to install two or more transformers in parallel than one large unit?
 - C. Draw and explain (in brief) the phasor diagram of transformer at no load.
 - D. Explain voltage and current ratios in a three phase transformers.
 - E. Draw the equivalent circuit and phasor diagram of an auto transformer.
 - F. List the various disadvantage(s) of three phase transformers.
 - G. What is armature reaction? Discuss.
 - H. What do you mean by commutation? Explain.
 - I. Discuss the effect of brush shift in a DC generator.
 - J. Why field test is performed in a DC motor? Discuss.

SECTION-B

2. The efficiency of a 20kVA, 2500/250 V, single phase transformer at unity power factor is 98% at rated load and also at half rated load. Determine core losses and ohmic losses.
3. Discuss the principle of operation of an auto transformer. Also compare it with two winding transformer.
4. The armature of a 4-pole lap-wound dc machine has a core length = 30 cm, diameter = 40cm, total conductors = 500, speed = 1200 rpm and current = 20 A. For an average flux density of 0.5 T, find the electromagnetic power developed and the internal torque.
5. Draw and discuss the equivalent circuit of three winding transformer. 6.

Explain the armature control method for speed control of a dc motor.

SECTION-C

7. a) Drive the emf equation of a single phase transformer.
b) Explain the construction and working principle of a D.C. machines.
8. Explain the following :
 - a) Series motor starter
 - b) Open and short circuit test of single phase transformer
9. A 3-phase transformer is used to step down the voltage of a 3- phase, 11 kV feeder line. Per phase turns ratio is 12. For a primary line current of 20 A calculate the secondary line voltage, line current and output kVA for the star-delta, delta-delta, star- star and delta-star connections. Neglect losses.

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.

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