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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(EE) PT (Sem.-1)

**TRANSFORMERS AND DIRECT CURRENT MACHINES**

Subject Code : BTEE-302

M.Code : 70972

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 & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

**SECTION-A****1. Answer briefly :**

- a. How is energy transferred from one circuit to another in a transformer?
- b. What is voltage regulation? Explain.
- c. Why is it preferable to install two or more transformers in parallel than one large unit?
- d. What is the significance of a phasor diagram? Explain.
- e. Explain the principle of a DC generator.
- f. What are the various disadvantage(s) of three phase transformers? Discuss.
- g. What is meant by armature reaction? Explain.
- h. What do you mean by plugging? Explain.
- i. List the various causes of bad commutation.
- j. Discuss the significance of efficiency.



**SECTION-B**

2. A short circuit test, when performed on a high voltage side of a 10kVA, 2000/400V, single phase transformer gave the following data :  
  
60V, 4A, 100 watts  
  
If the low voltage side is delivering full load (or rated) current at 0.8 p.f. lag and at 400V, find the voltage applied to high voltage side.
3. Discuss the principle of operation and construction of an auto transformer. Also compare it with two winding transformer.
4. Derive the expressions for the emf and torque generated in a dc machine.
5. Explain the delta/delta connections of three phase transformers.

**SECTION-C**

6. Describe the working of a three point starter for a DC shunt motor, with the help of a neat diagram.
7. a) The emf per turn for a single phase, 2310/220 V, 50 Hz transformer is approximately 13 V. Calculate :
  - i) The number of primary and secondary turns
  - ii) The net cross sectional area of the core, for a maximum flux density of 1.4 T.
- b) List the various methods of improving the commutation. Explain any one of these in detail.
8. Discuss the following :
  - a) Hopkinson test
  - b) One method for speed control of DC motors
9. Discuss in detail the parallel connections of three 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.**