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Total No. of Pages : 02

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B.Tech.(EE/Electrical & Electronics/Electronics & Electrical) (2011 Onwards)
(Electrical Engineering & Industrial Control) (2012 Onwards)
(Sem.–3)

TRANSFORMERS AND DIRECT CURRENT MACHINES

Subject Code : BTEE-302
Paper ID : [A1135]

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) Compare auto transformer with ordinary transformer.

c) Discuss briefly the effect of saturation on exciting current.

d) Draw the phasor diagram of a transformer under no load and loaded conditions.

e) List the advantages of three phase transformers.

f) Why field test is performed in a DC motor? Discuss.

g) Discuss the significance of back emf in a DC machine.

h) Explain the working principle of DC machines.

i) What do you mean by armature reaction? Explain.

j) List the various factors that affect the speed control of a motor.

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SECTION-B

2. Explain the working principle and construction of a single-phase transformer in detail.

3. Discuss the principle of operation, equivalent circuit and phasor diagram of an auto transformer.

4. Explain the delta-delta connections of three phase transformers. Also lists its advantages and disadvantages.

5. Discuss the function and constructional details of the following parts of the DC machine :

   a) Commutator

   b) Brush Assembly

   c) Interpoles

6. How are Dc motors started? Draw a neat diagram of 4-point starter used for DC shunt motor.

SECTION-C

7. What are the causes of bad commutation? Explain the methods of improving the commutation.

8. A 220/400 V, single phase transformer gave the following test results :

   Open circuit test : 220V, 1 A, 70W on LV side

   Short circuit test : 20V, 12A, 100W on HV side

   Draw the equivalent circuit of the transformer referred to :

   a) LV side.

   b) HV side and fill in the values of circuit parameters .

9. **Discuss the Following :**

   a) Swinburn's test.

   b) Any speed control method of DC motor.

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