SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | |

Total number of questions:06 Total number of pages:[1]

B.Tech. || EE || 3rd Sem

Transformer & DC Machine

Subject Code: BTEE-302 A/302 (RP)

Paper ID: M/18

(2015 batch onwards)
2011 & onwards.

Time allowed: 3 Hrs **Max Marks: 60**

Important Instructions:

- **All questions are compulsory**
- **Assume any missing data**

PART A (2×10)

Q. 1. Short-Answer Questions: All COs

(a) Why open circuit test and short circuit test are performed on transformer?
(b) What is meant by an auto transformer?
(c) List out various losses that take place in a transformer. Which loss is independent of load?
(d) What is the significance of back emf in a dc motor?
(e) What factor may be controlled in the operation of a dc motor?
(f) Define voltage regulation and efficiency of a transformer.
(g) What are the conditions to be filled for the parallel operation of a single phase transformer?
(h) Give the limitations of off tap changing transformer.
(i) Draw the equivalent circuit of a three winding transformer.
(j) Write the methods to control the speed of dc series motor.

PART B (8×5)

Q. 2. What is armature reaction? State the effects of armature reaction in dc machines. Derive the EMF equation of a DC machine. CO1

OR

With the help of connection diagram, explain how Scott connections are used to obtain two phase supply from a three phase supply. CO1

Q. 3. Derive expression for the load shared by each transformer when two transformers are operated in parallel with their voltage ratios equal. CO3

OR

Define commutation in dc machines. Explain the commutation process in a dc machine with neat diagrams and also describe the methods of improving CO3

commutation in dc machines.

Q. 4. In a no load test of a single phase transformer, the following test data were obtained: CO2

Primary voltage: 200 V; Secondary voltage: 110 V
Primary Current: 0.5 A; Power Input :30 V
Find (i) the turns ratio (ii) the magnetizing component of no load current (iii) the iron loss component of no load current (iv) iron loss. The resistance of primary winding is 0.6 ohm.

OR

A lap wound dc generator has 80 slots with 8 conductors per slot. It generates a no load emf of 300 V at 1000 rpm. Find the speed at which it should be driven to generate 240 V on open circuit. CO2

Q. 5. Draw and explain the nature of external characteristics for a dc shunt generator and various types of dc compound generators in one diagram. CO4

OR

Discuss the working of a two winding transformer. Develop its phasor diagram with an inductive load connected to the secondary winding. CO4

Q. 6. Write a short note on following: CO1

a) Swinburne's Test
b) Hopkinson test

OR

Write a short note on following: CO1

a) On load tap changing transformer
b) Off load tap changing transformer