

B. Tech. Sem –III (Electrical Engg.) 2014 COURSE) (CBCS) :
SUMMER - 2019
SUBJECT: ELECTRICAL MACHINES-I

Day: Saturday
Date: 11/05/2019

S-2019-2562

Time: 02.30 PM TO 05.30 PM
Max. Marks: 60

N.B:

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Draw neat diagram **WHEREVER** necessary.
 - 4) Assume suitable data **WHEREVER** necessary.
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- Q.1**
- a) Draw a no load diagram of a transformer. Explain briefly. **(05)**
 - b) A 5 kVA, 250/500V, 50Hz, 1-phase transformer gave following test results **(05)**
No. Load: 250V, 0.75A, 60W on LV side. Calculate equivalent circuit constants.

OR

- a) Define regulation. Also state the expression to find it. **(05)**
- b) Estimate % efficiency and % regulation of a 100kVA, 6600V/250V, 50Hz **(05)**
1- ph. Transformer at full load and 0.8 lagging p.f. from the following readings. OC test: 6600V, 1.5A, 900W
SC test: 290V, 12A, 860W

- Q.2**
- a) Describe merits and demerits of various connections of three phase transformers. **(05)**
 - b) What is the basic working principle of a three phase transformer? **(05)**

OR

What are the different connections of a 3 phase transformer? Explain each in detail. **(10)**

- Q.3**
- a) Describe the energy transfer in electromechanical systems. **(05)**
 - b) Discuss the forces and torques in magnetic field systems. **(05)**

OR

- a) Describe the expression for energy in singly excited magnetic field system. **(05)**
- b) How magnetic force and torque can be determined from energy? **(05)**

P.T.O.

- Q.4** a) Derive the emf equation of dc machine. State meaning of symbols used along with units. (05)
- b) A wave wound, 6 pole long shunt compound dc generator has 600 armature conductors. The generator is driven at 300 rpm. Calculate emf generated if the flux per pole is 0.06 wb. (05)

OR

- a) Compare armature control and flux control methods of DC shunt motor. (05)
- b) A 220V, DC shunt motor runs at 500 rpm drawing 16A current from field winding of 220Ω . Find extra resistance to be added in field winding to increase speed to 700 rpm. (05)

- Q.5** a) Explain the construction of a single phase induction motor along with a neat diagram. (05)
- b) Write a short note on commutator motor. (05)

OR

- a) Explain the double field revolving theory in detail. (05)
- b) Briefly describe the construction of shaded pole motor with a neat diagram. (05)

- Q.6** a) Write a short note on PMDC motor. (05)
- b) Enlist the applications of dry type transformer. (05)

OR

- a) Briefly explain the working principle of optical CT/PT. (05)
- b) What are the applications of PCB motor? (05)

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