

B. TECH. SEM –III (ELECTRICAL ENGG.) 2014 COURSE)

(CBCS) : SUMMER - 2018

SUBJECT: ELECTRICAL MACHINES-I

Day: Tuesday
Date: 22/05/2018

S-2018-2241

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.

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- Q.1** a) Draw and explain equivalent circuit of a 1 phase transformer. (05)
b) Derive the condition for maximum efficiency of a transformer. (05)

OR

- a) What are the conditions to be satisfied for parallel operation of single phase transformers? (05)
- b) Explain back to back test in detail. Also draw the relevant circuit diagram. (05)

- Q.2** a) What are the advantages and disadvantages of a 3 phase transformer over a bank of three 1 phase transformers? (05)
b) Explain open circuit test and short circuit test on 3 phase transformer. (05)

OR

- a) Draw and explain the following 3 phase transformer connections (05)
i) Star-star ii) Delta-delta
- b) Why three winding transformers are built with an additional winding called tertiary winding? (05)

- Q.3** a) Derive an expression for EMF Induced in a coil, rotating in a magnetic field. (05)
b) Why energy storing capacity of magnetic field is much larger than that of electric field? Justify. (05)

OR

- a) What is energy balance equation? (05)
- b) Derive an expression for the energy density of a magnetic field. (05)

- Q.4** a) Derive an EMF equation of DC generator. (05)
b) Explain in detail the Armature reaction. (05)

OR

What are the two different speed control methods in DC shunt motors? Explain each in detail and draw the relevant circuit diagrams. (10)

- Q.5** a) Using double revolving field theory, explain the torque-slip characteristics of a single phase Induction motor and prove that it cannot produce any starting torque. (05)
b) Explain the principle of operation of the repulsion- Induction motor. For what type of load is this motor suitable? Explain. (05)

OR

Describe the construction and working of repulsion motor. Write its merits and demerits as compared to series motors. (10)

- Q.6** a) Describe the construction and working of PMDC motor. (05)
b) Discuss applications of stepper motor. (05)

OR

- a) Describe the working of BLDC motor. (05)
- b) Write a short note on dry type transformer. (05)