Total No. of Questions—8] [Total No. of Printed Pages—2

Seat No.	

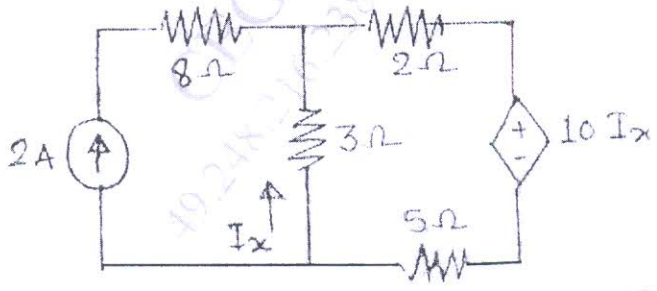
[5352]-533

S.E. (E & TC AND ELECTRONICS)
(FIRST SEMESTER) EXAMINATION, 2018
ELECTRICAL CIRCUITS AND MACHINES
(2015 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. :— (*i*) Answer Q. No. 1 *or* Q. No. 2, Q. No. 3 *or* Q. No. 4, Q. No. 5 *or* Q. No. 6 and Q. No. 7 *or* Q. No. 8.
(*ii*) Figures to the right indicate full marks.
(*iii*) Neat diagrams must be drawn wherever necessary.
(*iv*) Use of non-programmable electronic pocket calculator is allowed.
(*v*) Assume suitable data, if necessary.

Q1. (a) Find current Ix. [6]



(b) Explain open circuit test and short circuit test to be performed on transformer with neat circuit diagram. [6]

OR

Q2. (a) A 50 KVA, 2200/22 V, 50 Hz single phase transformer has an iron loss of 300 W. The resistances of low and high voltage windings are 0.005 Ω and 0.5 Ω respectively. If the p.f is 0.8 lagging, calculate maximum efficiency. [6]

(b) State and explain: Maximum Power Transfer Theorem. [6]

P.T.O.

Q3. (a) Derive emf equation for DC generator. [6]

(b) Explain the working principle of synchronous motor. [6]

OR

Q4. (a) With the help of neat diagram explain the Torque slip characteristics of Induction motor. [6]

(b) A 4 pole, 250 V, DC series motor has a wave connected armature with 200 conductors. The flux per pole is 25 mWb when the motor is drawing 60 A from the supply. Armature resistance is 0.15 Ω while the series field winding resistance is 0.2 Ω. Calculate speed under this condition. [6]

Q5. (a) Explain the construction and working principle of BLDC motor. Also draw its speed torque characteristics. [7]

(b) Explain in detail the principle of working, types and applications of the Reluctance motor. [6]

OR

Q6. (a) Write a short note on Universal Motor. [7]

(b) Distinguish between Brushless DC motor and Conventional DC Motor. [6]

Q7. (a) Write short notes on servomotors. [7]

(b) What are Stepper motors? How are they classified? Plot static and dynamic characteristics of stepper motor. [6]

OR

Q8. (a) Describe the principal of operation of single phase split phase type induction motor along with its circuit and phasor diagram. [7]

(b) Write short note on Stepper Motors. [6]