Total No. of Questions—**8**] [Total No. of Printed Pages—**3**

Seat No.	

[5459]-134

S.E. (Electronics and Telecom. and Electronics) (I Sem.) 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**, 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 calculator is allowed.

(*v*) Assume suitable data, if necessary.

1. (*a*) State and explain Norton's Theorem. [6]

(*b*) Explain construction and working of Isolation transformer. State its applications. [7]

Or

2. (*a*) A single-phase transformer delivers 10 Amp, 220 V to a resistive load while the primary draws 6 Amp at 0.9 lagging p.f. from 450 V, 50 Hz supply. The turns ratio of transformer is 2. Calculate efficiency and regulation under this condition. [6]

(*b*) State and explain superposition theorem. [7]

P.T.O.

3. (*a*) Sketch and explain D.C. shunt motor characteristics. [6]

(*b*) Sketch and explain working of rotor resistance starter used for three-phase induction motor. [6]

Or

4. (*a*) The rotor, of a 6 pole, 440 V, 50 Hz three-phase induction motor, has a power input of 60 kW. The frequency of rotor emf is 1.5 Hz. Calculate : [6]

(*i*) Rotor Cu loss

(*ii*) Gross mech. power developed

(*iii*) The rotor resistance per phase if the rotor current/ph is 58 Amp.

(*b*) A d.c. shunt motor operating on 220 V supply draws current of 22 Amp and runs at 800 rpm. Its armature resistance is 1 ohm and field resistance is 110 Ω. Calculate the additional resistance to be inserted in series with armature to reduce the speed to 520 rpm keeping load on motor constant. [6]

5. (*a*) Compare Brushless DC motor with conventional DC motor. [6]

(*b*) Explain with neat diagram working of Universal Motor. [6]

Or

6. (*a*) Explain construction and working of Reluctance motor. [6]

(*b*) State applications of : [6]

(*i*) Universal motor

(*ii*) Reluctance motor and

(*iii*) Brushless DC motor.

7. (*a*) Explain with a neat diagram working of DC servomotor. [7]

(*b*) Explain with neat diagram operation of single-phase shaded pole induction motor. [6]

Or

8. (*a*) What is stepper motor ? State different types of it. State applications of stepper motor. [7]

(*b*) State applications of : [6]

(*i*) DC Servomotor

(*ii*) AC Servomotor

(*iii*) Shaded pole induction motor.