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

Seat No.	

[4957]-1037

S.E. (Electrical) (Second Semester) EXAMINATION, 2016

ELECTRICAL MACHINES-I

(2012 PATTERN)

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

N.B. **:—** (*i*) Answer : Q. **1** or Q. **2**, Q. **3** or Q. **4**, Q. **5** or Q. **6**, Q. 7 or Q. **8**

(*ii*) Neat diagrams must be drawn wherever necessary.

(*iii*) Figures to the right indicate full marks.

(*iv*) Use of logarithmic electronic pocket calculator is allowed.

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

1. (*a*) Enlist the advantages of indirect load test on a single phase transformer, hence explain its procedure to determine the voltage regulation and efficiency of a transformer. [6]

(*b*) Explain the necessity of parallel operation. What are the conditions for satisfactory operation of transformer in parallel ? [6]

Or

2. (*a*) Derive the equation for saving of copper in case of autotransformer as compared to two winding transformer along with necessary diagram. [6]

P.T.O.

(*b*) With neat circuit diagram, explain the V-V connection of transformers. State its merits and demerits. [6]

3. (*a*) Compare LAP and WAVE winding of a DC machine. [6]

(*b*) Sketch and explain the characteristics of D.C. Series Motor. State its applications. [7]

Or

4. (*a*) What do you mean by commutation ? Explain the causes and effects of bad commutation. [6]

(*b*) A 230V d.c. series motor has an armature resistance of 0.15Ω and field resistance of 0.1 Ω runs at 800 rpm, when taking a current of 100 A. Calculate the speed, when the motor is taking the current of 25 A from the supply and if the field flux is reduced to 45% of that of 100 A. [7]

5. (*a*) Explain the concept of Rotating Magnetic Field (RMF) in case of 3ϕ induction motor along with phasor diagrams. [7]

(*b*) Explain the power flow diagram of an induction motor. [5]

Or

6. (*a*) Differentiate between squirrel cage and slip induction motors. [5]

(*b*) An 18.65 kW, 4 pole, 3ϕ, 50 Hz, induction motor has friction and windage losses are 2.5% of output. The full load slip 4%. Calculate rotor copper loss, rotor input and shaft torque of the motor. [7]

7. (*a*) Enlist various types of starters for three phase indication motor. With neat sketch, explain star-delta starter along with its merits and demerits. [7]

(*b*) Sketck and explain a typical Torque-Slip characteristic of a three phase induction motor. What is the effect of increasing the rotor circuit resistance on this characteristic ? [6]

Or

8. (*a*) Explain the step by step method of finding equivalent circuit parameters of induction motor using No load and blocked rotor test. [7]

(*b*) Draw exact and approximate equivalent circuits in case of three phase indication motor. [6]