Total No. of Questions—**12**] [Total No. of Printed Pages—**4**

Seat No.	

[4857]-118

S.E. (Mech., Mech s/w, Prod., Prod. s/w, Automo.) (Second Semester) EXAMINATION, 2015

ELECTRICAL TECHNOLOGY

(2008 PATTERN)

Time : Three Hours **Maximum Marks : 100**

N.B. **:—** (*i*) Answer any *three* questions from each Section.

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

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

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

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

SECTION I

1. (*a*) Explain with suitable diagram and phasor diagram, use of one wattmeter method for measurement of reactive power of three phase balanced load. [6]

(*b*) With the help of diagram explain use of CT and PT for measurement of energy in single-phase system. [6]

(*c*) State and explain factors affecting good lighting scheme. [6]

Or

2. (*a*) Explain any *one* method used in practice for power factor improvement. [6]

(*b*) Estimate the readings on two wattmeters used to measure active power of three-phase load having 0.3 power factor lagging and input power 10 kW. Given supply 3ϕ, 50 Hz, 500 V, AC supply. [6]

P.T.O.

(*c*) Explain the following terms in connection with lighting : [6]

(*i*) Illumination

(*ii*) Luminous Intensity

(*iii*) Luminous flux.

3. (*a*) Explain the following terms in connection with transformer operation : [4]

(*i*) Efficiency

(*ii*) Regulation.

(*b*) Draw only single line diagram of typical distribution transformer substation. [4]

(*c*) State and explain with diagram power flow of three-phase induction motor. [8]

Or

4. (*a*) State industrial applications of squirrel cage and slip ring induction motor (*two* each). [4]

(*b*) Write 1ϕ | 3ϕ transformer specifications. [4]

(*c*) State why starter is necessary while starting three-phase induction motor. Name the various starters used in practice and explain any *one* of them with diagram. [8]

5. (*a*) Draw only two pole shaded pole single-phase motor. Name the parts of it. [4]

(*b*) What are the various specifications stated on the name plate of the single-phase motor ? [4]

(*c*) Explain the step-by-step procedure followed to find out regulation of 3ϕ alternator by synchronous impedance method for various types of load (lag, lead and unity power factors). [8]

Or

6. (*a*) State the various types of single-phase induction motors used in practice with one application of each type (any *four* types). [4]

(*b*) Write the formula for emf generated per phase of the three phase alternator. Explain various terms involved in it. [4]

(*c*) Explain with simple diagram construction, working, advantages, disadvantages and features of salient and non-salient type rotor construction of alternators. [8]

SECTION II

7. (*a*) Write the formula for the emf generated in the d.c. generator. Explain the various terms involved in it. [5]

(*b*) Write down any *four* applications of stepper motor. [5]

(*c*) Draw and explain internal and external characteristics of :

(*i*) D.C. Shunt Motor

(*ii*) D.C. Series Motor. [8]

Or

8. (*a*) Write any *four* industrial applications of universal motor. [5]

(*b*) State *two* applications of the following D.C. motors : [5]

(*i*) Shunt Motor

(*ii*) Series Motor.

(*c*) Explain with the help of diagram armature voltage control and flux control methods of speed control of D.C. shunt motor. [8]

9. (*a*) Explain constructional details of the SCR. Also draw symbol of SCR. [4]

(*b*) Draw and explain transfer characteristics of the 'N-ch MOSFET'. [4]

(*c*) Draw and explain V-I characteristic of SCR. Also show effect of GATE current on it. [8]

Or

10. (*a*) Draw only symbol of : [4]

(*i*) Diac

(*ii*) Triac

(*iii*) GTO

(*iv*) IGBT.

(*b*) State and explain various specifications of SCR (any *four*). [4]

(*c*) Explain contruction, working, transfer characteristics and output characteristics of *n*-channel MOSFET. [8]

11. (*a*) State and explain various advantages of electrical drive over conventional drives. [8]

(*b*) With the help of circuit diagram explain any *one* method speed control of three-phase induction motor. [8]

Or

12. (*a*) Explain : [8]

(*i*) Group Drive

(*ii*) Individual Drive used in industries.

(*b*) State and explain with diagram two quadrant chopper. [8]