

(3 Hours)

[ Total Marks : 80

- N. B. :** (1) Question No. 1 is **compulsory**.  
(2) Attempt any **three** out of the remaining.  
(3) Assume suitable Data if required.  
(4) Figures to the right indicate full marks.



1. Attempt the following :- 20
- (a) Explain different types of D.C. generators.
  - (b) Draw torque - speed characteristics of three phase induction motor and explain.
  - (c) State the types of circuit breakers. Explain any one.
  - (d) Explain resistance welding process control using SCR.
2. (a) Draw and explain the following characteristics of D.C. shunt motor. 10
- (i) Speed / Torque
  - (ii) Torque / Armature current.
- (b) Describe the construction and working of D.C. shunt generator. Can same machine work as a D.C. shunt motor? 10
3. (a) Explain the construction and working principle Three phase induction motor. 10
- (b) Explain construction and working principle of transformer. 10
4. (a) Explain the following related to electrical energy : 10
- (i) Transmission of electrical energy
  - (ii) Distribution of electrical energy
- (b) State the characteristics of an ideal OP-AMP and explain any two applications of OP-AMP with suitable diagrams. 10
5. (a) With block diagram, explain the working of programmable logic controller. 10
- (b) State and explain the various factors required for selection of motor for industrial applications. 10
6. Write short notes on any three: 20
- (a) Stepper motor.
  - (b) Circuit breaker & Isolators.
  - (c) Multiplexer & Demultiplexer.
  - (d) Application of SCR for speed control of AC motor.