



6300

December-2008

## Electrical Technology

Time : 3 Hours]  
(2 : 30 P.M. to 5 : 30 P.M.)

[Max. Marks : 100

- Instructions :**
- (1) Attempt all questions from both sections.
  - (2) Use separate answer book for each section.
  - (3) Figures to the right indicate full marks.
  - (4) Assume suitable data, if necessary.

## SECTION – I

1. (a) Define power-factor in different terms. Discuss the disadvantages of low power-factor. 18
- (b) Derive an expression for the most economical value of power-factor.
- (c) A synchronous motor improves the power factor of a load of 200 kW from 0.80 lagging to 0.90 lagging. Simultaneously the motor carries a load of 80 kW. Find :
  - (i) the leading kVAR supplied by the motor.
  - (ii) kVA rating of the motor and
  - (iii) power factor at which the motor operates.
2. (a) What is a sub-station ? Explain the classification of sub-station. 16
- (b) Discuss the various factors which are required to be considered for selecting a motor for a particular drive.

OR

- (a) Explain the types of flip-flops.
- (b) Explain any four logic gates with their Boolean algebra.
3. (a) Discuss the methods of speed control for d.c. motors. 16
- (b) Determine developed torque and shaft torque of 220 V 4-pole series motor with 800 conductors wave connected supplying a load of 8.2 kW by taking 45 A from the mains. The flux per pole is 25 mWb and its armature circuit resistance is  $0.6 \Omega$ .

OR

- (b) A 250 V d.c. shunt motor with armature resistance of  $0.5 \Omega$  runs at 600 r.p.m. on full load and takes an armature current of 20 A. If resistance of  $1.0 \Omega$  is placed in the armature circuit, find the speed at (i) full load torque (ii) half full load torque.

**SECTION – II**

4. (a) Explain the classification of electrical measuring instruments. **16**  
(b) Discuss about the essential torques for indicating instrument.

**OR**

- (b) What are the limitations of moving coil instruments ? Write comparison between moving coil and moving iron ammeter.
5. (a) Discuss the open circuit and short circuit tests performed for transformer. What are the uses and advantages of these tests ? **16**  
(b) Explain the process of dielectric heating. Write the applications of dielectric heating.

**OR**

- (a) Discuss the construction features and working of 3-phase induction motor. What are the types of 3-phase induction motor ?  
(b) Compare arc welding and resistance welding. What are the types of resistance welding ?
6. Write technical notes on : (any **three**) **18**  
(i) Megger  
(ii) Equivalent circuit of 1-phase transformer.  
(iii) Tariff and its types  
(iv) Electric breaking.
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