



**Electrical Machines & Industrial Electronics**  
**(1120, 1110, 1100)**

P. Pages : 2

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answer sheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Figures to the right indicate full marks.
5. Draw neat sketches wherever necessary.
6. Assume suitable additional data if necessary.
7. Use of non - programmable electronic calculator is allowed.

**UNIT - I**

1. Attempt **any two** **7**
- a) i) A 4 - pole, d.c. Generator with a shunt field resistance of  $100\Omega$  and an armature resistance of  $1\Omega$  has 378 wave connected conductor in it's armature. The flux / pole is 20 mwb. if a Load resistance of  $10\Omega$  is connected across the armature terminals and the generator is driven at 1000 rpm. calculate the power absorbed by the Load.
- ii) State the applications of D. C. motors. **3**
- b) State and Explain speed control methods used for D. C. shunt motor. **10**
- c) i) Draw Three point starter used for D. C. motor and explain the Functions of protective devices used in it. **5**
- ii) State and Explain Electric braking of D. C. series motor. **5**

**UNIT - II**

2. Attempt **any two** **10**
- a) Derive Torque equation of 3 - phase induction motor and also derive the condition for maximum torque and Hence draw Torque - slip characteristics.

- b) Explain with neat figures the construction and principle of operation of D. C. servomotor with applications. **10**
- c) Explain the need of starter for 3 - phase Induction motor ? Draw and Explain **10**
- i) Auto - Transformer starter and
- ii) Star - Delta starter used for 3 - phase squirrel cage I. M.

**UNIT - III**

3. Attempt **any two** **10**
- a) Define voltage Regulation of Alternator and Explain synchronous impedance method of finding voltage Regulation. Also state the application of synchronous motor ?
- b) i) Explain the Hunting in case of synchronous motor ? How it is prevented ? **10**
- ii) State and explain method of starting of 3 - phase synchronous motor ?
- c) Explain the operation of solid state relay with applications. Also enlist the advantages of solid state relays over electromechanical relay. **10**

**UNIT - IV**

4. Attempt **any two** **10**
- a) What do you mean by mechanically operated switches ? State it's types and explain them with neat figures.
- b) Explain construction and working of LVDT with neat diagram. State it's advantages and disadvantages. **10**
- c) What are different types of Temp. Sensors ? Explain thermocouple and thermistors with neat diagram & their characteristics. **10**

**UNIT - V**

5. Attempt **any two.** **10**
- a) Explain with neat figure the major components of data acquisition system.
- b) Write short Note on **10**
- i) Robotics & ii) CNC
- c) Draw and explain pressure control system with applications. **10**

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