

Total No. of Questions : 8]

SEAT No. :

**P4899**

[Total No. of Pages : 2

**[4959]-1087**

**B.E. (E & TC) (Semester - I)  
Industrial Drives and Control (IDC)  
(2012 Pattern) (Elective - I (a))**

*Time :2.5 Hours]*

*[Maximum Marks : 70*

*Instructions to the candidates:*

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Figures to the right indicate full marks.*
- 3) *Assume suitable data, if necessary.*

- Q1)** a) Draw the operating torque speed characteristics of separately excited DC motor and explain field weakening operation. **[6]**
- b) State the expression for torque of an induction motor. Explain voltage control method for variation of speed of induction motor and its limitations. **[8]**
- c) Explain feedback controlled speed regulation of a motor drive. **[6]**

OR

- Q2)** a) Explain the motor selection parameters for elevator application. **[6]**
- b) Explain briefly the starting methods of an induction motor. **[6]**
- c) Draw complete diagram of V/F controlled induction motor drive with suitable converters. **[8]**

- Q3)** a) With the help of cross section diagram, explain the advantages of hybrid stepper motor over permanent magnet stepper motor. **[8]**
- b) State the advantages and limitations of permanent magnet synchronous motor. **[8]**

OR

**P.T.O.**

- Q4)** a) What is torque angle of a synchronous motor? Draw torque Vs torque angle characteristics for a cylindrical rotor synchronous motor. [8]
- b) Compare R/L drive and Chopper based drive for bi-polar stepper motor. [8]

- Q5)** a) Draw Bi-directional converter circuit used in wind power application and state its necessity. [8]
- b) Compare different types of battery charging systems used in renewable energy application. [8]

OR

- Q6)** a) Explain the principle of power flow from renewable energy source to utility Grid. [8]
- b) With the help of schematic diagram explain the incremental conductance method for MPPT controller in solar photovoltaic system. [8]

- Q7)** a) Explain fuzzy logic controller based induction motor drive for wind energy application. [9]
- b) What is expert system in an artificial intelligence area? Explain with the example of ANN based power converter. [9]

OR

- Q8)** Write short notes on [18]
- a) Four Quadrant chopper drive for DC motor.
- b) Circuit diagram to operate the switched reluctance motor.
- c) Different methods of MPPT tracking in solar photo voltaic systems.

