

Total No. of Questions : 8]

SEAT No. :

**P1861**

**[4859]-1042**

[Total No. of Pages : 2

**B.E. (E & TC)**

**d - INDUSTRIAL DRIVES AND CONTROL  
(2012 Course) (Semester - I) (End Sem) (Elective - I)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Assume suitable data, if necessary.*

- Q1)** a) Draw equivalent circuit diagram of DC series motor and state the equations that govern the operation of motor. [8]
- b) Draw and explain the power circuit of single phase semi-converter feeding a separately excited DC motor. Explain with typical waveforms, the operation in continuous and discontinuous armature current modes. [8]
- c) With the help of a simple block diagram, explain different components of a motor drive system. [4]

OR

- Q2)** a) Explain advantages and limitations of rotor resistance control of Induction motor? [6]
- b) What is slip power recovery? Draw the circuits used to recover slip power. [6]
- c) With the neat circuit diagram explain working of Switched Reluctance motor drive. Why is it preferred as adjustable speed drive? [8]

- Q3)** a) Mention various types of stepper motors. Explain the operation of any one type of stepper motor. Enlist various applications of Stepper motors. [8]
- b) A 200 steps per revolution stepper motor is rotating a screw and nut arrangement having a pitch of 5 mm. Calculate the number of pulses required to give to stepper motor to move the nut by 10 cm, if motor is driven in half step mode or full step mode. [8]

OR

*P.T.O.*

**Q4) a)** With the help of a neat circuit diagram and waveforms explain the operation of 3 phase brushless dc motor drive. State the applications of 3 phase brushless dc motor drive. [10]

b) With the help of suitable diagram, explain Chopper drive for a stepper motor. [6]

**Q5) a)** Draw equivalent circuit of a basic solar cell, explain each component. What is the reason of reduction in solar output with increase in temperature? [6]

b) With the help of neat block diagram explain stand alone, hybrid and grid connected PV power system. [6]

c) What is the need of charge controller in Photovoltaic Power Systems? Explain any one type of charge controller in PV power system. [6]

OR

**Q6) a)** Draw diagram and explain different parts of a horizontal axis wind mill. State the relation of wind velocity and power output? [6]

b) With the help of neat block diagram explain the working of grid connected wind power system. [6]

c) What are different types of batteries used for solar application? Explain Float cum Boost charging method for lead acid batteries. [6]

**Q7) a)** Explain the operation of neural network based PWM controller. [8]

b) How we can apply Fuzzy logic system in power electronics? Explain any typical application. [8]

OR

**Q8) a)** Explain the operation of neural network based control system. Explain general design methodology of neural network based system. [8]

b) What is Neuro fuzzy system? Explain Adaptive network based Fuzzy Interface System. [8]

