Total No. of Questions : 8]

SEAT No. :

P1861

[Total No. of Pages : 2

[4859]-1042
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]**