Total No. of Questions : 12] SEAT No. :

**P4900** [Total No. of Pages : 3

**[4959]-116**

# B.E. (Electronics)

# ADVANCE POWER ELECTRONICS

## (2008 Course)

*Time : 3 Hours]* *[Max. Marks : 100*

***Instructions to the candidates:-***

1) ***Answers to the two sections should be written in separate books.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

## SECTION - I

***Q1)*** a) Draw a neat circuit diagram and relevant waveforms of a single phase series full converter. **[10]**

b) Why power factor of a controlled converter is never unity even for a resistive load? **[8]**

OR

***Q2)*** a) Explain how unwanted harmonics are eliminated in a 12 pulse converter? **[8]**

b) Draw a circuit diagram of 3 phase IGBT based PWM rectifier and explain the advantages. **[10]**

***Q3)*** a) Draw equivalent circuit diagram of a separately excited DC motor. State the equations that govern the operation of the motor. Explain the field weakening operation. **[8]**

b) Draw a circuit diagram and waveforms of a Cyclo converter to reduce the incoming frequency by a factor of four. **[8]**

OR

***Q4)*** a) Why V/f method of induction motor speed control is very popular? **[8]**

b) Draw circuit diagram and explain operation of ZCS converter. **[8]**

***P.T.O.***

*Q5)* a) Draw circuit diagram of a three level multilevel inverter and explain the device selection criteria. **[8]**

b) Explain the third harmonic injection modulation method to improve THD of inverter output. **[8]**

OR

*Q6)* a) Why PLL drive improves the speed regulation of a drive? **[8]**

b) Explain microcontroller based DC motor drive. **[8]**

## SECTION - II

*Q7)* a) Compare linear power supply, SMPS and resonant converter power supply. **[6]**

b) Explain an application where Low Drop out regulator is essential. **[6]**

c) Explain the concept of soft switching. **[6]**

OR

*Q8)* a) With relevant diagram explain traction motor drive. **[8]**

b) What are parallel redundant power supplies? How load is shared in these supplies? **[10]**

*Q9)* a) What is power quality? Explain the different line disturbances and their mitigation techniques. **[8]**

b) Why Bi-Directional converter is essential for a wind energy system? **[8]**

OR

*Q10)*a) What are the advantages and applications of HVDC system? **[8]**

b) Draw schematic circuit of solar PV operated battery assisted DC motor drive? **[8]**

***Q11)***a) What are synchronous rectifiers? Explain in detail. **[8]**

b) Explain Fuzzy logic based wind generation system. **[8]**

OR

***Q12)*** Write short notes on : **[16]**

a) Z source inverters

b) Cascaded H bridge multilevel inverters

c) Energy Audit

d) Flexible AC transmission