

Total No. of Questions : 8]

SEAT No. :

PD4302

[Total No. of Pages : 2

[6403]-100

T.E. (E & TC Engineering)

POWER DEVICES & CIRCUITS

(2019 Pattern) (Semester - VI) (304194)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6 and Q7 or Q8.
- 2) Neat diagrams and waveforms must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of nonprogrammable calculator is allowed.
- 5) Assume Suitable data if necessary.

- Q1)** a) Draw a three phase inverter for balanced star R load? Explain its operation of 120° mode with gate signals & output waveforms. [12]
- b) Compare 120° mode with 180° mode in three phase bridge inverter. [5]

OR

- Q2)** a) Explain working of single phase full bridge inverter for R load with input & output waveforms. Derive an expression for rms o/p voltage. [8]
- b) Compare freewheeling diode with feedback diode. [5]
- c) What is mean by harmonics in inverters? Explain how harmonics can be reduced. [4]

- Q3)** a) Draw circuit diagram of step up chopper and derive an expression for its output voltage. [8]
- b) Explain various control strategies in DC chopper. [4]
- c) Compare step up & step down choppers. [6]

OR

- Q4)** a) Explain with neat diagram the operation of 4 quadrant chopper with dc motor as a load. [9]
- b) Input to the step up chopper is 200V. The output required is 600 V. If the conducting time of thyristor is 200 μ sec. Calculate: [9]
- i) Chopping Frequency
 - ii) If the pulse width is halved for constant frequency operation, find new output voltage.

P.T.O.

- Q5)** a) What is the need of resonant converter? Explain ZCS resonant converter with circuit & waveforms. [8]
b) Explain the role of heat sink? Draw its thermal equivalent circuit. [5]
c) What are various EMC standards? Explain any two. [4]

OR

- Q6)** a) What is the need of resonant converter? Explain ZVS resonant converter with circuit & waveforms. [8]
b) What are different over voltage protection techniques in power electronics? Explain any one in detail. [5]
c) Compare resonant converters: ZVS with ZCS. [4]

- Q7)** a) Explain various performance parameters of batteries in battery operated power systems. [6]
b) Explain with suitable circuit diagram working of a LED driver. [6]
c) Explain working of electronic ballast with block schematic. [6]

OR

- Q8)** a) Draw & explain single phase full wave ac voltage controller for resistive load with o/p voltage waveforms. [6]
b) Explain with neat diagram variable voltage type three phase induction motor drive. [6]
c) Explain operation of Off-line UPS with block schematic. [6]

