

B.Tech Sem – VI (2007 Course) (Electronics) : SUMMER - 2019
SUBJECT: POWER ELECTRONICS DEVICES & CIRCUITS

Day : Monday
Date : 27/05/2019

S-2019-3124

Time : 02.30 PM TO 05.30 PM
Max. Marks: 80

N. B. :

- 1) **Q. No.1 and Q. No.5 are COMPULSORY.** Out of the remaining attempt **ANY TWO** questions from each Section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answer to both the sections should be written in **SAME** Answer book.
- 4) Use of non-programmable electronic **CALCULATOR** is allowed.
- 5) Assume suitable data if necessary.

SECTION-I

- Q.1**
- a) Compare power BJT and Power MOSFET. (05)
 - b) Explain the concept of line commutation. (05)
 - c) Describe the significance of harmonics. (04)
- Q.2**
- a) Draw and explain the switching characteristics of Power diode. (07)
 - b) Describe two transistor analogy of SCR. (06)
- Q.3**
- a) With neat diagram and operational waveform explain the working of three phase semiconverter with resistive load (07)
 - b) A single phase half wave controlled rectifier is used to supply power to 10Ω load from 220V, 50 Hz supply at firing angle of 45° . Calculate: (06)
i) average output voltage ii) effective output voltage
iii) average load current
- Q.4**
- a) With the help of circuit diagram and relevant waveform explain the operation of single phase full bridge inverter for resistive load. (07)
 - b) Compare 120° mode and 180° mode for three phase inverter. (06)

SECTION-II

- Q.5**
- a) Compare switched mode and resonant converters. (05)
 - b) Discuss principle of integral cycle. (05)
 - c) Discuss need of UPS. (04)
- Q.6**
- a) Describe the operation of step-up chopper with resistive load. (06)
 - b) A chopper is operating on time ratio control principle at a frequency of 2KHz on 200V Dc supply. If the load voltage is 170V, calculate the conduction period and blocking period of chopper in each cycle. (07)
- Q.7**
- a) Draw the diagram of triggering circuit for single phase AC voltage controller using TCA 785. Explain its operation with relevant waveform. (07)
 - b) Compare phase angle control and integral cycle. (06)
- Q.8**
- a) Describe HVDC transmission with 12-pulse converter diagram. (07)
 - b) Write note on: Electronic Ballast. (06)

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