

TE - sem - VI (old) Electronics - Power Electronics
201216

Q.P. Code : 590702

(3 Hours)

[Total Marks : 100

- N.B. : (1) Question No. 1 is **compulsory**
(2) Solve any **four** questions out of remaining **six** questions
(3) Figures to the right indicate **full** marks

1. (a) Draw and explain gate characteristics of SCR 5
(b) Explain the working of UJT with the help of its symbol, equivalent circuit and characteristics 5
(c) Explain the use of MOV for overvoltage protection. 5
(d) Draw and explain RC triggering circuit with the help of waveforms. 5
2. (a) Draw and explain centre-tapped full wave converter with the help of waveforms. Derive relation for output average and RMS load voltage. 10
(b) Draw and explain class-D commutation circuit with the help of waveforms. 10
3. (a) What is the need of equalising circuit in series connection of SCRS. Write design formulae for equalising components. 10
(b) Explain three phase fully controlled bridge rectifier with R load in discontinuous current mode. Derive expression for average load voltage. 10
4. (a) Explain the working of light dimmer circuit using TRIAC-DIAC. Draw associated waveforms. 10
(b) A single phase fully controlled bridge converter supplies an inductive load. Assuming that the output current is virtually constant and is equal to I_o determine following parameters if the supply voltage is 230V and if $\alpha = \frac{\pi}{6}$ 10
 - (i) Average supply voltage
 - (ii) Supply RMS current
 - (iii) Fundamental power
 - (iv) Supply power factor
 - (v) Supply harmonic factor

253-1

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Q.P. Code : 590702

2

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|--------|---------------------------------------------------------------------------------------------------------|----|
| 5. (a) | What do you understand by latch-ups in IGBT. How it can be avoided. | 10 |
| (b) | Draw and explain snubber circuit to protect the SCR against high $\frac{di}{dt}$ & high $\frac{dv}{dt}$ | 10 |
| 6. (a) | Draw and explain integral cycle triggering with zero voltage switch | 10 |
| (b) | Explain the commutation of SCR in controlled rectifier | 5 |
| (c) | Draw and explain GTO switching characteristics | 5 |
| 7. | Write short notes on | 7 |
| (a) | V-I characteristics of SCR | 6 |
| (b) | Turn on methods of SCR | 7 |
| (c) | Different cooling techniques | |

253-2