

SEAT No. _____

SARDAR PATEL UNIVERSITY

B.Sc. Sixth semester

Electronics and Communication

US06CELC01

Power Electronics

Monday, 26/03/2018

Time: - 10:00 AM To 1:00 PM

Marks: - 70

[38]

Q1 Choose the correct Answer.(Attempt all) [10]

- 1 Gate circuit or triggering circuit of thyristor is _____ circuit.
(a) Magnetic. (b) High power. (c) Lower power. (d) None
- 2 SCR is a _____ layer and _____ junction device.
(a) 3,3 (b) 4,3 (c) 4,2 (d) 5,3
- 3 A chopper is a device that converts _____ voltage.
(a) AC - AC (b) AC -DC (c) DC-DC (d) DC -AC
- 4 In which chopper, output voltage is higher than the input voltage?
(a) Step down. (b) Step up. (c) CLC. (d) None
- 5 In case of class A type commutation or load commutation with low value of resistance R the preferred connection is _____
(a) L-C in series with R. (b) L is in series with R
(c) L-C across R (d) None
- 6 Which of the following is used for surge protection of SCR?
(a) Snubber circuit (b) heat sink (c) fuse (d) None
- 7 What is function of chopper?
(a) AC to DC converter (b) DC transformer
(c) High speed semiconductor switch (d) Time ratio controller
- 8 The load voltage of a chopper can be controlled by varying the
(a) reactor position (b) firing angle (c) duty cycle (d) None
- 9 What is the device conduction period for full wave circuit?
(a) 45° (b) 120° (c) 90° (d) 180°
- 10 Which type of commutation is used when the load is commutated by transferring its load current to another incoming thyristor?
(a) Class C (b) Class B (c) Class A (d) Class F

Q2 Answer in short.(Any Ten) [20]

- 1 Enlist the method of turning off SCR.
- 2 Define : DC Chopper
- 3 List the advantages of three phases half wave rectifier.

- 4 Differentiate between DIAC and TRIAC.
- 5 What do you mean by Phase Voltage?
- 6 Explain AC line commutation.
- 7 Draw the circuit diagram of Class E commutation method.
- 8 What is line commutated converter?
- 9 Give the difference between forced commutation and self commutation.
- 10 Define: Holding current.
- 11 Classify chopper and explain it.
- 12 What is reverse blocking mode?

Q3 Discuss in detail the principle, construction and working of SCR. [10]

OR

Q3 [a] Explain the turn on method for SCR. [04]

[b] Discuss the operation of TRIAC in detail. [06]

Q4 [a] With necessary circuit diagram discuss in detail Class A commutation method. [07]

[b] Explain Class F commutation method. [03]

OR

Q4 [a] Write a short note on Class B commutation technique. [06]

[b] Discuss the Class D commutation method. [04]

Q5 Explain in detail step up chopper with necessary circuit diagram and also draw waveforms. [10]

OR

Q5 [a] Describe the control strategies for choppers. [05]

[b] Explain step down type A chopper with resistive load. [05]

Q6 Explain three phase full wave rectifier with necessary circuit diagram and waveforms. [10]

OR

Q6 What are uncontrolled rectifiers? Explain three phase half wave uncontrolled rectifier with necessary circuit diagram. [10]