

[90]

SEAT No. _____

No. of Printed Pages : 2

SC

SARDAR PATEL UNIVERSITY

M.Sc. Instrumentation & Control

SEM – II, March 2019

Power Electronics

Subject code : PS02EINC21

DATE: 26th March 2019

DAY: Tuesday

TIME: 10:00 PM TO 1:00 PM

TOTAL MARKS: 70

Q. 1 Choose the correct answer.

[08]

- (1) IGBT has _____.
(A) Low input impedance (C) Both (A) & (B)
(B) High switching speed (D) None of above
- (2) PUT is _____ device.
(A) Three layer with gate terminal (C) four layer with gate terminal
(B) Three layer without gate terminal (D) four layer without gate terminal
- (3) Series connected SCR used to control high _____ & Parallel connected SCR used to control high _____.
(A) Voltage, current (C) Voltage, voltage
(B) Current, voltage (D) Current, current
- (4) The commutation techniques of thyristors are classified into _____.
(A) Natural commutation (C) Both (A) & (B)
(B) Forced commutation (D) None of above
- (5) Thyristor Conducting interval is called the overlap interval if _____.
(A) Any one thyristor is on (C) All thyristor is off
(B) Half no of thyristor is on (D) All thyristor is on
- (6) Class C Chopper is _____ quadrant chopper
(A) One (C) Three
(B) Two (D) Four
- (7) A cycloconverter refers to a frequency changer that can change AC power from one frequency to _____.
(A) AC power at another frequency (C) DC power at another frequency
(B) AC power at same frequency (D) DC power at same frequency
- (8) Motor speed can be varied by controlling the _____.
(A) Armature voltage (C) Both (A) & (B)
(B) Field current (D) None of Above

Q.2 Answer the following.(attempt any seven, each two marks)

[14]

- (1) Draw characteristic of SCR with suitable labels.
- (2) What is SUS & SCS In power thyristor family?
- (3) Write a note on ASCR.
- (4) Explain Three phase converter system Using Diode.
- (5) What are Effects of Source impedance on the performance of converters
- (6) Write disadvantage of frequency chopper.
- (7) What is invertor? List advantage and working of invertor.
- (8) Draw the symbol of P-channel & N-channel enhancement MOSFET with lables.
- (9) Draw circuit diagram of multiphase chopper.

(1)

(P.T.O)

- Q.3 (A) Enlist and Explain thyristor turn on methods in detail with necessary diagrams. [06]
 (B) Define string efficiency, with necessary connections and diagram explains series operation of SCR. [06]
- OR
- (B) Explain in detail TRIAC & DIAC with necessary wave forms & construction block diagram. [06]
- Q.4 (A) Discuss in detail Single phase full wave midpoint converter. [06]
 (B) Explain with necessary diagram CLASS C: L-C switched by another load carrying SCR & CLASS E: An external pulse source for commutation for thyristor. [06]
- OR
- (B) Write a note on Self commutated thyristor by resonating load & LC circuit. [06]
- Q.5 (A) Explain basic principle of cycloconverter with block diagram & show working of single phase step up cycloconverter. [06]
 (B) Write a note on working & principle of step up chopper. [06]
- OR
- (B) Explain with necessary diagrams Current commutation chopper. [06]
- Q. 6 (A) Write a note on squirrel cage motor and explain its construction and working. [06]
 (B) List needs of electrical breaking, explain in detail regenerative breaking mode. [06]
- OR
- (B) Show schemes for DC motor speed control and derive an equation for average speed (N). [06]

