

[34]

SARDAR PATEL UNIVERSITY

M.Sc. Instrumentation & Control

SEM – II, April 2018

Power Electronics(PS02EINC21)

DATE: 19th April, 2018

DAY: Thursday

TIME: 10:00AM TO 1:00 PM

TOTAL MARKS: 70

Q. 1 Choose the correct answer.**[08]**

- (1) Equivalent of SCR circuit is design with _____ transistor.
- (A) 1 PNP & 1 NPN (C) 2 NPN
(B) 2 PNP (D) None of above
- (2) For SUS thyristor name implies = _____.
- (A) silicon Union switch (C) silicon Universal switch
(B) silicon Uninterrupted switch (D) None of above
- (3) The process of turn off thyristor is known as _____.
- (A) Connecting (C) Both (A) & (B)
(B) Triggering (D) None of above
- (4) In single phase circuit Thyristor Conduction interval is called the 'overlap interval' if _____.
- (A) Any one thyristor is on (C) Any three thyristor is on
(B) Any two thyristor is on (D) All four thyristor is on
- (5) A DC chopper is a static device that converts fixed DC input voltage to a _____ output voltage directly.
- (A) variable AC (C) Both (A) & (B)
(B) variable DC (D) None of above
- (6) Motor speed can be varied by controlling the _____.
- (A) Armature voltage (C) Both (A) & (B)
(B) Field current (D) None of above
- (7) In single phase drive A smoothing inductor, L_m is normally connected in _____.
- (A) Parallel (C) Never connect
(B) Series (D) None of Above
- (8) A step down cycloconverter is used to _____.
- (A) Divide voltage (C) Divide current
(B) Divide frequency (D) Change phase

Q.2 Answer the following.(attempt any seven, each two marks)**[14]**

- (1) What is DIAC? How it is useful in power electronics?
- (2) Draw the symbol of N-channel and P- channel enhancement MOSFET with labels.
- (3) What is source impedance? Explain in short.
- (4) Give an comparison of single phase and Three phase thyristor converter circuit
- (5) List disadvantages of Frequency chopper.
- (6) What is base speed of motor? How base speed is important for power controlling ?
- (7) Write a short note on LASC.
- (8) Write a short note on TRIAC.
- (9) Briefly explain Silicon Controlled Switch (SCS).

C.P.T.O.)

- Q.3 (A) Write a detailed note on SCR characteristics and list turn ON process for SCR, [06]
explain any two turn on method in detail.
- (B) Explain PUT, SCS, SITH, GAT with necessary symbol and diagrams. [06]

OR

- (B) Define string efficiency. With help of necessary expressions explain Parallel [06]
operation of SCR.

- Q.4 (A) Describe principle of phase controlled rectifier with necessary circuit diagram, [06]
waveform and its application.
- (B) Write note on Class A and Class F Ac line commutator. [06]

OR

- (B) With help of necessary circuit and wave forms explain working of single-phase [06]
semi-converter with RLE load.

- Q.5 (A) With neat diagram show working of second Quadrant and four Quadrants [06]
chopper.
- (B) What is cycloconverter? Explain working of mid-point and bridge type [06]
cycloconverter.

OR

- (B) Explain current commutated & load commutated chopper. [06]

- Q.6 (A) Write short notes on: principle of A.C. motor operation with its equivalent [06]
circuit diagram.
- (B) Show schemes for DC motor speed control and derive and equation for [06]
average speed (N).

OR

- (B) List needs of electrical breaking, Explain in detail regenerative breaking mode. [06]

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