

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**MSc DEGREE EXAMINATION DECEMBER 2018
(First Semester)**

Branch - APPLIED ELECTRONICS

POWER ELECTRONICS

Time : Three Hours

Maximum : 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 x 1 = 10)

- 1 An SCR is a ___ device.

(i) four layer, four junction	(ii) four layer, three junction
(iii) four layer, two junction	(iv) three layer, single junction
- 2 For a practical SCR, in the reverse blocking mode, the leakage current _____.

(i) does not flow	(ii) flows from anode to cathode
(iii) flows from cathode to anode	(iv) flows from gate to anode
- 3 A thyristor is turned off when the anode current _____.

(i) falls below the holding current	(ii) falls below the latching current
(iii) rises above the holding current	(iv) rises above the latching current
- 4 The load is commuted by transferring its load current to another incoming thyristor is called _____ communication method.

(i) class A or load	(ii) class B or resonant
(iii) class C or complementary	(iv) class D or impulse
- 5 AC voltage controller converts

(i) fixed AC to fixed DC	(ii) variable AC to variable DC
(iii) fixed AC to variable AC	(iv) variable AC to fixed AC
- 6 In a AC voltage controller, pulse gating is suitable for

(i) R loads only	(ii) R and RL loads
(iii) RL loads only	(iv) RC Loads
- 7 The duty cycle of a chopper is given by _____.

(i) T_{on} / T_{off}	(ii) T_{on} / T
(iii) T / T_{on}	(iv) T_{off} / T_{on}
- 8 The load voltage of a chopper is controlled by varying the _____.

(i) duty cycle	(ii) firing angle
(iii) reactor position	(iv) extinction angle
- 9 Single phase half bridge inverters require _____.

(i) two wire AC supply	(ii) two wire DC supply
(iii) three wire AC supply	(iv) three wire DC supply
- 10 The output current wave of a single-phase full bridge inverter on RL load is _____.

(i) a sine wave

(ii) a triangular wave

(iii) constant dc

Cont...

SECTION - B (35 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 7 = 35)

- 11 a Discuss about the operation and applications of a DIAC.
OR
b Justify the advantages of Optoisolators in power electronic circuits,
- 12 a Show how does the impulse commutation is implemented in thyristors.
OR
b State the advantages of external pulse commutation of thyristors,
- 13 a Illustrate the operation of a 3-phase AC switch.
OR
b Explain the principle of phase control in AC voltage controllers,
- 14 a Classify the operations of one, two and four quadrant choppers.
OR
b Discuss briefly about the operation of Switching mode regulators.
- 15 a Explain the functions of Single phase bridge inverters.
OR
b Sketch a block diagram to show the method of V / F control in AC drives.

SECTION - C (30 Marks!)

Answer any THREE Questions

ALL Questions Carry EQUAL Marks (3 x 10 = 30)

- 16 Elucidate the basic structure and operations of a GTO, sketch its two transistor model and mention any two applications.
- 17 Differentiate the Load side and Line side Commutation of SCRs with diagrams.
- 18 Analyze the operation of a single phase cyclo converter.
- 19 Assess the functions of Buck and Boost regulator with block diagram.
- 20 Evaluate the operation of a three phase voltage source inverter.

Z-Z-Z

END