

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2022
(First Semester)

Branch - APPLIED ELECTRONICS

AUTOMOTIVE POWER ELECTRONICS/POWER ELECTRONICS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 SCS is a thyristor with ____
(i) One anode gate (ii) One cathode gate
(iii) Without gate (iv) Two gates
- 2 Cycloconverter is a ____ frequency ____ conversion converter.
(i) Low to high, two stage (ii) Low to high, single stage
(iii) High to low, single stage (iv) High to low, multistage
- 3 A Step up chopper is called as ____ chopper.
(i) Type A (ii) Type B
(iii) Type E (iv) Two quadrant chopper
- 4 In three phase full converter operation SCR conduct for ____
(i) 120° (ii) 90°
(iii) 270° (iv) 45°
- 5 The input voltage of BLDC motor is ____
(i) Sine wave (ii) Square wave
(iii) Triangular wave (iv) None of the above

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a) State reason why gate circuit should be protected in thyristor?
OR
b) List out the advantages of GTO over SCR.
- 7 a) In ac /dc solid state relay, how electrical isolations are achieved?
OR
b) What is the function of freewheeling diode in a converter?
- 8 a) What are the control strategies used in varying the duty cycle of choppers?
OR
b) List out the applications, advantages and disadvantages of boost regulator.

Cont...

- 9 a) Compare three phase and single phase converter.
OR
b) Write short notes on harmonic in inverter.
- 10 a) State various methods to control the speed of a motor.
OR
b) Write a short notes on Current Sensors.

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

- 11 a) With a neat sketch explain UJT triggering circuit.
OR
b) Explain (i) Transfer characteristics.
(ii) Switching characteristics of power MOSFET.
- 12 a) Discuss briefly the principle of integral cycle control for power control.
OR
b) Draw necessary diagram and explain the principle of single phase voltage controller with RL load.
- 13 a) Derive an expression for average output voltage of step up chopper.
OR
b) Discuss the operation, voltage and current waveforms of Buck Boost regulator.
- 14 a) Derive an equation for average output voltage of 3 phase half wave converter for resistive load.
OR
b) With neat diagram, explain single PWM method for voltage control of inverters.
- 15 a) What are the characteristics of BLDC motor? Explain it's working principle.
OR
b) Explain with neat sketch, the construction and working principle of switched reluctance motor.

Z-Z-Z

END