

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2023
(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 When an SCR is turned on, the voltage across it is about _____.
(i) 0 V (ii) 0.1 V
(iii) 1.0 V (iv) 10 V
- 2 How many switches are used to build a three-phase cycloconverter?
(i) 10 (ii) 14
(iii) 18 (iv) 24
- 3 A four-quadrant chopper cannot be operated as _____.
(i) Thyristor (ii) Cycloconverter
(iii) One quadrant chopper (iv) Inverter
- 4 A three-phase full converter is supplying a purely resistive load at 220 V dc for 00 firing angle, find the output voltage for 900 firing angle.
(i) 0 V (ii) 30 V
(iii) 60 V (iv) 90 V
- 5 The frame of an induction motor is made of _____.
(i) Silicon steel (ii) Stainless steel
(iii) Cast iron (iv) Aluminum

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a What is opto isolator? Briefly explain its operation.
OR
b Explain the operations of SCR.
- 7 a State and explain the operation of solid state relay.
OR
b Discuss the principle of phase control with necessary diagrams.
- 8 a Describe the operation of voltage commuted chopper.
OR
b Describe the operation of boost regulators with neat diagram.

Cont...

9 a Explain the working principle of half wave controlled converters.

OR

b Describe the various types of PWM techniques.

10 a What is BLDC? Explain its operation.

OR

b State the importance of induction and DC motor controls.

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

11 a Explain the operation of relaxation oscillator using UJT.

OR

b Explain how speed control of DC shunt motor using thyristors is carried out.

12 a State the differences between single phase and three phase AC switches.

OR

b Discuss in details about single phase cyclo converters.

13 a State and explain the switching mode regulators.

OR

b Show the difference between MOSFET and Transistor based choppers.

14 a State and explain about the operation of three phase fully controlled converter with R-RL load.

OR

b Give the features of three phase and single phase bridge inverters.

15 a Describe how open and close loops are controlled using speed and current sensors.

OR

b Explain the working principle of motor construction and it's applications.

Z-Z-Z

END