

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2024  
(First Semester)

Branch – APPLIED ELECTRONICS

AUTOMOTIVE POWER ELECTRONICS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

- 1 A diac has ..... terminals.  
a) Two    b) Three    c) Four    d) None of the above
- 2 A UJT has .....  
a) Two pn junctions                      b) One pn junction  
c) Three pn junctions                     d) None of the above
- 3 AC voltage controllers convert \_\_\_\_\_  
a) fixed ac to fixed dc                    b) variable ac to variable dc  
c) fixed ac to variable ac                 d) variable ac to fixed ac
- 4 A relay is ..... switch.  
a) A mechanical                            b) An electronic  
c) An electromechanical                 d) None of the above
- 5 Choppers converter \_\_\_\_\_  
a) AC to DC                                 b) DC to AC  
c) DC to DC                                 d) AC to AC
- 6 What is the duty cycle of a chopper ?  
a)  $T_{on}/T_{off}$     b)  $T_{on}/T$     c)  $T/T_{on}$     d)  $T_{off} \times T_{on}$
- 7 A rotary converter is a single machine with \_\_\_\_\_  
a) One armature and one field  
b) Two armatures and one field  
c) One armatures and two fields  
d) None of the above
- 8 Which of the following methods may be used to convert AC system to DC ?  
a) Rectifiers                                 b) Motor converters  
c) Motor generator set                     d) All of the above
- 9 Which of the following is used to build a electric drive?  
a) Source                                      b) Motor  
c) Control unit                                d) All of the mentioned
- 10 The speed of a BLDC motor can be controlled by \_\_\_\_\_.  
a) Changing input DC voltage    b) Changing temperature  
c) Changing wind direction        d) Cannot be controlled

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 × 7 = 35)

11.a. Explain about the characteristics of DIAC.

(OR)

11.b. Write short notes on UJT with diagram.

Cont...

- 12.a. Summarize the features of solid state relay.  
(OR)
- 12.b. Explain about the single phase bidirectional controller with inductive load.
- 13.a. Explain the various parameters used in output voltage control technique.  
(OR)
- 13.b. Classify the different situations of switching mode regulator.
- 14.a. Write a note on designing of three phase fully controlled rectifier with RL Load.  
(OR)
- 14.b. Explain the function of voltage source inverter with 120degree conduction mode.
- 15.a. Describe the working of DC motor control with neat diagram.  
(OR)
- 15.b. Write a note on designing of switch reluctance motor.

**SECTION -C (30 Marks)**

Answer ANY THREE questions

ALL questions carry EQUAL Marks

(3 × 10 = 30)

- 16 Summarize the features of MOSFET.
- 17 Briefly explain the function of 3-phase AC switch with neat diagram.
- 18 Distinguish between Buck and Boost regulator.
- 19 Explain about three phase fully converter with R & RL load.
- 20 Describe the working of open loop and closed loop control through speed sensor.

Z-Z-Z

END