

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2022
(Fifth Semester)

Branch – PHYSICS

DISCIPLINE SPECIFIC ELECTIVE – i
SEMICONDUCTOR ELECTRONICS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 x 1 = 10)

1. Choose a pentavalent impurity has valence electrons.
(i) 3 (ii) 5 (iii) 4 (iv) 6
2. Identify the reverse current in a diode
(i) μA (ii) mA (iii) μA (iv) A
3. Choose in npn transistor are the minority carriers.
(i) free electrons (ii) holes (iii) donor ions (iv) acceptor ions
4. When a transistor amplifier is operating, the current in any branch is
(i) sum of a.c and d.c (ii) a.c only
(iii) d.c only (iv) difference of a.c and d.c
5. Find a feedback circuit usually employs network.
(i) resistive (ii) capacitive
(iii) inductive (iv) capacitive-inductive
6. Identify a Zener diode is used as a voltage regulating device.
(i) series (ii) shunt
(iii) series- shunt (iv) parallel
7. The Q of a crystal is the order of
(i) 100 (ii) 1000 (iii) 50 (iv) more than 10,000
8. Choose in amplitude modulation bandwidth is the audio signal frequency.
(i) thrice (ii) four times
(iii) twice (iv) five times
9. Identify a monostable multivibrator has
(i) no stable state (ii) one stable state
(iii) two stable state (iv) three stable state
10. Indicate the positive clipper is that which removes the half cycles of the input voltage.
(i) negative (ii) positive
(iii) partially negative (iv) partially positive

SECTION - B (35 Marks)

Answer ALL Questions

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

- 11.(a) Analyze the volt ampere characteristics of p-n junction.
(OR)
(b) Explain the ripple factor.
- 12.(a) Bring out the transistor common base connection.
(OR)
(b) Develop transistor load line analysis common emitter circuit.

Cont...

- 13.(a) outline the effects of negative current feedback.
(OR)
(b) Explain operation of an op-amp adder and subtractor.
- 14.(a) Explain the working of tuned collector oscillator.
(OR)
(b) Explain the circuit and working of Wien- Bridge oscillator.
15. (a) With a neat sketch, explain the working of astable multivibrator.
(OR)
(b) Describe the working of differentiating circuit.

SECTION - C (30 Marks)

Answer any **THREE** Questions

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

16. Discuss the commonly used semiconductors and energy band description of semiconductors.
17. Analyze the RC coupled amplifier.
18. Outline the principle of negative current feedback and current gain with negative current feedback.
19. Differentiate amplitude modulation and frequency modulation.
20. Discuss the switching action of a transistor.

Z-Z-Z

END