

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2024
(Fifth Semester)

Branch – PHYSICS

MAJOR ELECTIVE COURSE - I : SEMICONDUCTOR ELECTRONICS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 What bonds are present in a semiconductor?
(i) monovalent (ii) bivalent
(iii) trivalent (iv) covalent
- 2 A transistor has ----- pn junctions
(i) one (ii) two
(iii) three (iv) four
- 3 Feedback circuit is ----- of frequency
(i) independent (ii) strongly dependent
(iii) moderately dependent (iv) none of the above
- 4 Hartely oscillator is commonly used in
(i) radio receivers (ii) radio transmitters
(iii) TV receivers (iv) none of the above
- 5 The gate of a JFET is ----- biased
(i) reverse (ii) forward
(iii) reverse as well as forward (iv) none of the above

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a Explain the variation of fermi level with temperature in semiconductor.
OR
b Draw a volt-ampere characteristics of pn junction.
- 7 a Draw the input and output characteristics of CB connection.
OR
b Draw the diagram for pull push amplifier.
- 8 a What is the principles of negative voltage feedback in amplifiers with a neat diagram.
OR
b Draw a digram for DC regulated power supply.

Cont...

- 9 a Write down the principle of Hartely oscillator with a neat sketch.

OR

- b Define amplitude modulation with example.

- 10 a Give the circuit diagram for clamping circuit.

OR

- b Elucidate SCR as full wave rectifier.

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 6 = 30)

- 11 a Derive an expression of carrier concentration in n-type semiconductor.

OR

- b With a neat sketch, explain full wave bridge rectifier.

- 12 a Describe the various methods used for biasing in detail.

OR

- b Explain RC coupled amplifier with a frequency response.

- 13 a Explain the following of OP-AMP

(i) Inverting amplifier

(ii) non- Inverting amplifier

OR

- b Explain the following of OP-AMP

(i) Adder

(ii) subtractor

- 14 a Describe Wein bridge oscillator with a neat diagram.

OR

- b Explain different parts of super heterodyne receiver.

- 15 a With a suitable diagram, explain astable multivibrator.

OR

- b Explain the construction and working of MOSFET.

Z-Z-Z

END