Total No. of printed pages = 5

RETEST EXAMINATION – 2022

Semester : 3rd (Old)

Subject Code : Et-304

ELEMENTS OF ELECTRONICS ENGINEERING

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Instructions :

1. *All* questions of PART – A are compulsory.
2. Answer any *five* questions from PART – B.

PART – A

Marks – 25

1. Fill in the blanks : 1×10=10

   (a) A pure semiconductor is called ______.

   (b) A vacuum diode can be used as a ______.

   (c) When the outermost orbit of an atom has exactly four valence electrons, the material is generally a ______.

[Turn over

(d) The suppressor grid in a pentode eliminates the undesirable effect of _____.

(e) The electronic device which convert a.c. into d.c. power is called _____.

(f) Semiconductors have _____ temperature coefficient of resistance.

(g) For proper operation of transistor, base-emitter junction should be _____ and collector-base junction _____.

(h) The maximum efficiency of a full wave rectifier is _____.

(i) A circuit which produces electrical oscillations of any desired frequency is known as _____.

(j) An oscillator employs _____ feedback.

2. Write true or false : 1×10=10

(a) A semiconductor diode has one P-N junction.

(b) In N-type semiconductor, electrons are the minority carriers.

(c) A Zener diode is used as a rectifier.

(d) Negative feedback reduces gain.

(e) Positive feedback is used in high amplifiers.

(f) A collpitt's oscillator uses a tapped capacitor.

(g) A triac is equivalent to two SCRs in parallel.

(h) The function of a transistor is to do amplification.

(i) The input resistance of a transistor is much more than its output resistance.

(j) A forward biased diode will act as an open switch.

3. Choose the correct answer : 1×5=5

(a) In a semiconductor, the energy gap between valence band and conduction band is nearly _____. (1eV, 1.5eV, 0.7eV)

(b) The addition of trivalent impurity creates _____. (holes, free electrons)

(c) The base of a transistor is _____ doped. (lightly, heavily, moderately)

(d) A FET is a _____ transistor. (unipolar, bipolar)

(e) An SCR is a _____ switch. (unidirectional, bidirectional)

PART – B

Marks – 45

4. (a) What is a P-N junction ? 1

(b) Explain the formation of potential barrier in a P-N junction. 4

(c) Draw and explain the V-I characteristics of a P-N junction. 4

5. (a) What is a Zener Diode ? 1

(b) With a neat sketch, explain the working of Full-Wave Bridge Rectifer. 4

(c) Derive an expression for the efficiency for a Half-Wave Rectifier. 4

6. (a) What is multistage amplifier ? How many types of coupling is used in amplifier circuit ? Name them. 4

(b) With a neat circuit diagram explain the working of transformer-couple transistor amplifier. 5

7. (a) A resistor is coded with red, yellow, violet and silver. What is the value of the resistor ? 4

(b) Define α and β. Deduce the relation between α and β. 5

8. (a) Draw the symbol of N-P-N and P-N-P transistor. 1

(b) Draw Common Emitter, Common Base and Common Collector configuration for N-P-N and P-N-P transistor. 3

(c) With proper circuit diagram explain the working of a Common Emitter transistor connection. 5

9. (a) Explain the operation of a tank circuit with neat diagram. 5

(b) Discuss the essentials of an oscillator. 4

10. Write short notes on any *two* : $4\frac{1}{2}\times2=9$

(i) Hartley Oscillator

(ii) Voltage divider bias method

(iii) Class A, Class B, Class C and Class AB power amplifiers.