Total No. of printed pages = 5

Et-304/EEtE/3rd Sem/2017/N

ELEMENTS OF ELECTRONICS ENGINEERING

Full Marks – 70

Time – Three hours

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

Answer Q. No. 1 and any *three* from the rest.

1. Fill in the blanks : $1 \times 25 = 25$

   (a) A signal that varies continuously is known as _____ signal.

   (b) Resistance, capacitance and inductance is known as _____ component.

   (c) An electronic component that can modify a signal is known as _____ component.

   (d) A vacuum tube extract electrons from cathode by _____ emission.

[Turn over

(e) A pentode has _____ electrodes.

(f) In resistance colour code, the fourth band indicates _____.

(g) Silicon is a _____.

(h) Germanium is a _____ valent material.

(i) A pure semiconductor is also known as _____ semiconductor.

(j) The process of adding impurity in pure semiconductor to make it an extrinsic semiconductor is known as _____.

(k) To make N-type semiconductor, _____ valent impurity is added to pure semiconductor.

(l) Free electrons are present in _____ band.

(m) The conductivity of a material can be explained by _____ band diagram.

(n) A junction _____ can be constructed by using P and N type semiconductor.

(o) A _____ has three terminals viz. base, emitter and collector.

(p) A PN junction diode can be used as a _____.

(q) A zener diode is used in _____ biased condition.

(r) A _____ can be used as an amplifier.

(s) 180° phase reversal of a signal occurs in a single stage _____.

(t) In common emitter amplifier, the base emitter circuit is forwardly biased and the collector circuit is _____ biased.

(u) Depending on biasing, a _____ can be operated in cut-off, active and saturation condition.

(v) In an oscillator the basic circuit which produces the oscillation is called _____ circuit.

(w) Hartley oscillator or Colpitts oscillator generates _____ wave.

(x) A crystal generates oscillation based on _____ effect.

(y) The full form of CRO is _____.

2. (a) What do you mean by emission of electrons ? What are the different types of electron emission ? Describe with suitable diagram. 8

(b) With neat diagram explain the operating principle of a vacuum triode. 7

3. (a) With the help of V-I characteristic, explain the operating principle of a semiconductor diode. 8

(b) Explain how a zener diode can be used as a voltage regulator. 7

4. (a) Draw the different types of transistor biasing circuit for NPN transistor. 8

(b) With circuit diagram explain the working principle of a transistor as an amplifier. 7

5. (a) Classify amplifier with the help of its output characteristic and load line. 8

(b) Draw the circuit of a push pull amplifier and explain its operation. 7

6. (a) What is an oscillator ? Explain the basic principle of an oscillator with the help of a circuit. 8

(b) With circuit diagram explain the operation of a Hartley oscillator. 7

7. Write short notes on any *two* : 7½×2=15

(a) Cathode Ray Oscilloscope

(b) Energy band diagram

(c) R-C coupled amplifier.