TKN/KS/16–5811

Second Semester B. Sc. Examination

ELECTRONICS

Paper – I

(Semiconductor Devices)

Time : Three Hours] [Max. Marks : 50

N. B : (1) All questions are compulsory and carry equal marks.
(2) Draw neat and well labelled diagrams wherever necessary.

EITHER

1. (A) Give the symbol of p-channel JFET. What are the carriers in it ? Draw the transfer characteristics of p-channel JFET and explain it Mark the I_{DSS} and V_{PO} on it. 2+1+5+2

OR

(B) Discuss construction and working of Enhancement mode MOSFET either in N-channel or in P-channel. Draw its drain characteristics and explain the various regions of it. 5+5

EITHER

2. (A) Explain the construction, working and characteristics of SCR. Explain firing of SCR using two transistor analogy. 7+3

OR

(B) Explain the construction and working of a UJT. Draw its equivalent circuit. Draw the characteristics of UJT and mark the various regions on it. 5+1+4

EITHER

3. (A) Define h-parameters. Describe the double subscript notation of h-parameter of a transistor in CE mode. Give the various classes of amplifiers and differentiate them with respect to Q-point. 1+3+6

OR

(B) Draw and explain the frequency response of RC coupled amplifier in the low, mid and high frequency regions. What is a multistage cascaded amplifier? What is the need of cascading ? 6+2+2

EITHER

4. (A) State the differences (any three points) between class B push–pull and class B complementary symmetry amplifiers.
Draw the circuit of a class B push–pull amplifier. Explain its AC and DC load lines. 3+4+3

OR

(B) What is cross-over distortion ? Draw the circuit of a class AB amplifier and explain its working. Compare voltage and power amplifiers. 2+6+2

5. Answer any **Ten** :—

(A) Why is JFET called voltage controlled device ?

(B) Draw the symbol of n-channel DE-MOSFET.

(C) Define drain Resistance V_d.

(D) What are the various Triggering modes of TRIAC ?

(E) Draw the symbol of a DIAC.

(F) State the principle of UJT relaxation oscillator.

(G) Draw the hybrid equivalent circuit of a CE amplifier.

(H) What should be the ideal value of input Impedance of an amplifier ?

(I) What are the coupling elements used in a direct coupled amplifier ?

(J) State any two advantages of class A operation.

(K) What is the maximum efficiency of a class B amplifier ?

(L) Define power gain of a power amplifier.