Bachelor of Science (B.Sc.) Semester—II Examination

ELECTRONICS (Semiconductor Devices)

Optional Paper—1

Time : Three Hours] [Maximum Marks : 50

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

EITHER

1. (A) What is JFET ? Explain the construction and working of N-channel JFET. Give the advantages and disadvantages of FET over BJT. 1+6+3

OR

(B) Explain construction of Depletion type N-channel MOSFET and explain its working with suitable diagram. Define three parameters of JFET. 7+3

EITHER

2. (A) What is UJT ? Explain the IV characteristics of UJT. Draw the circuit diagram of Relaxation Oscillator using UJT and explain its working. State any two applications of UJT. 5+4+1

OR

(B) What is SCR ? Give the symbol of SCR. Explain the working of two transistor analogy of SCR with suitable circuit diagram. Draw and explain V-I characteristics of TRIAC. 2+5+3

EITHER

3. (A) What is amplifier ? Define the following amplifier parameters :

(i) Input impedance

(ii) Output impedance

(iii) Voltage gain

(iv) Current gain.

Explain classification of amplifier on the basis of Q. Point (operating point). 5+5

OR

(B) Define four h-parameters of small signal CE amplifier. Draw h-parameter equivalent circuit of CE amplifier. Derive the expression for voltage gain and current gain in terms of h-parameter. 4+1+5

EITHER

4. (A) Explain construction and working of Class-B push-pull power amplifier. Derive an expression for its efficiency. State any two advantages of Class-B push-pull power amplifier. 3+3+3+1

OR

(B) Compare voltage amplifier and power amplifier. Explain construction and working of complementary symmetry Class B power amplifier. State its any two advantages. 3+6+1

5. Solve any **TEN** :

(A) What is MOSFET ?

(B) State any two applications of MOSFET.

(C) Draw transfer characteristics of JFET.

(D) What is DIAC ?

(E) Define the term “intrinsic stand off ratio”.

(F) Define holding current of SCR.

(G) Name the amplifiers on the basis of frequency.

(H) What is DC amplifier ?

(I) What is unit less h-parameters ?

(J) Give any two drawbacks of Class A transformer coupled power amplifier.

(K) What is power transistor ?

(L) What is cross-over distortion ? 10×1=10