SPM/KW/22/1075

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

ELECTRONICS (New Course)

(Semiconductor Devices)

Optional Paper–1

Time : Three Hours] [Maximum Marks : 50

N.B. :— (1) All questions are compulsory and carry equal marks.

(2) Draw neat diagrams wherever necessary.

EITHER

1. (A) What are intrinsic and extrinsic semiconductors ? Explain P-type and N-type semiconductors. Describe the formation of a P-N junction and how it works as forward and reverse biased. 2+3+5

OR

(B) Draw and explain the characteristics of a Zener diode in reverse biased mode. Explain the Avalanche and Zener breakdown mechanisms. 5+5

EITHER

2. (A) What is BJT ? Explain the construction of BJT with labelled diagrams. Differentiate between CE, CB and CC configurations. State biasing conditions for operating the transistor in active region. 2+6+2

OR

(B) What is transistor biasing ? Explain voltage divider and emitter biasing method. What is load line and operating point ? 2+5+3

EITHER

3. (A) Describe Construction and Working of N-Channel JFET. Explain output and transfer characteristics of a JFET. 5+5

OR

(B) Explain the Construction and Working of a N-Channel depletion MOSFET. Describe static and transfer characteristics of D-MOSFET. 5+5

EITHER

4. (A) Explain the Construction and Working of a Uni-Junction Transistor (UJT). Explain the characteristics of UJT. 5+5

OR

(B) Explain the Construction and Working of SCR. Draw the V-I characteristics of SCR and explain it. 5+5

5. Attempt any **ten** :

(A) State the materials used in the construction of LED.

(B) Draw energy band diagram of a semiconductor.

(C) Draw V-I characteristics of a diode.

(D) Sketch the symbols of PNP and NPN transistors.

(E) What is reverse saturation current ?

(F) Define alpha and beta of a transistor.

(G) List applications of FET.

(H) Draw the symbols of a P-Channel and N-Channel MOSFET.

(I) How are FET classified ?

(J) Draw the V-I characteristics of DIAC.

(K) What is switching device ?

(L) State the applications of a SCR. 1×10