AU–242

M.Sc. Semester–I (C.B.C.S. Scheme) Examination

1ELE1 : ELECTRONICS

(Fundamentals of Semiconductor Devices)

Time : Three Hours] [Maximum Marks : 80

Note :— (1) All questions are compulsory.

(2) Draw well labelled diagrams wherever necessary.

EITHER

1. (a) Differentiate between P-type and N-type semiconductor. 4

(b) Explain carrier concentration in an intrinsic semiconductor. 6

(c) Explain conduction and valance band in semiconductor. 6

OR

(p) Explain the following terms :

(i) Intrinsic semiconductor

(ii) Extrinsic semiconductor. 6

(q) What is Hall effect ? Explain in detail. 4

(r) What is mobility ? Explain the mobility of Silicon and Germanium. 6

EITHER

2. (a) Explain effect of temperature of pn-junction diode. 8

(b) Explain linearly graded and abrupt junctions of diode. 8

OR

(p) Explain breakdown mechanism of p-n junction diode. 8

(q) Draw and explain J-V characteristics of p-n junction diode. 8

EITHER

3. (a) Draw symbols of following :

(i) PIN diode (ii) Tunnel diode

(iii) Zener diode (iv) Varactor diode 4

(b) Draw and explain construction and working of Schottky diode. 8

(c) Write application of zener diode. 4

OR

(p) Describe the physical mechanism for zener breakdown. 6

(q) Explain Gunn effect in detail. 6

(r) Write applications of varactor diode. 4

EITHER

4. (a) Explain input and output characteristics of CE mode of transistor. 8

(b) Explain construction and working of MOSFET. 8

OR

(p) Describe the fabrication of transistor by using alloy and diffusion type. 8

(q) Explain construction and working of n-channel FET. 8

EITHER

5. (a) Explain in detail the following measurement techniques used for semiconductor :

(i) Conductivity (ii) Hall effect 8

(b) Explain methods of isolation planner technology semiconductor measurement with example. 8

OR

(p) Explain the concept of doping in semiconductor with example. 8

(q) Explain the terms :

(i) Wafer preparation

(ii) Growth of dielectric layers. 8