AMIRAJ
COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT: H & AS.
SEMESTER: 1/2
SUBJECT: PHYSICS
SUBJECT CODE: 3110018
FACULTY: DR. SONAL MATHUR

ASSIGNMENT 2

SEMICONDUCTORS

1. Give difference between N type and P type semiconductors.
2. Explain drift and diffusion current.
3. Explain diffusion mechanism in detail
4. Derive expression of electron concentration in conduction band.
5. Explain intrinsic and extrinsic semiconductors with necessary diagram.
6. What is PN junction diode? What is external bias? Describe its forward and reverse bias conditions with appropriate diagram.
7. Derive equations for n-type semiconductor to determine dependence of fermi level on temperature and doping concentration.
8. Write a note on metal semiconductor junctions.
9. Consider two-dimensional square lattice of side 3.0 Å. At what electron momentum values do the sides of first Brillouin zone appear? What is the energy of free electron with this momentum?
10. Consider n-type silicon semiconductor with a length of 100 μm, cross sectional area 10-7 cm^2 , minority charge carrier life time 10-6 s, μe is 0.13 m^2 / Vs and μh is 0.05 m^2 / Vs. Find (a) Electron transit time (b) Photo conductor gain when voltage applied to the photoconductor is 12 V.