

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous Degree College with P.G. Section under University of Calcutta)

B.A./B.SC. SECOND SEMESTER EXAMINATION, MAY 2011

FIRST YEAR

ELECTRONICS (General)

Date : 26/05/2011

Time : 10 am – 12 noon

Paper : II

Full Marks : 50

Answer any five questions:

1.
 - a) What is carrier mobility?
 - b) Why is Si preferred over Ge in the manufacturing of IC?
 - c) What is band gap energy? Distinguish between metal, insulator and semiconductor. [2+3+(2+3)]
2.
 - a) State Mass action law.
 - b) Why is a photodiode operated under reverse bias condition?
 - c) Why is the base region of a BJT kept narrow?
 - d) What do you mean by the PIV rating of a diode? [2+3+3+2]
3.
 - a) Explain the non-linearity of a P-N junction diode.
 - b) Write the equation giving the current-voltage characteristics of a P-N Junction diode.
 - c) Distinguish between a zener diode and a rectifying P-N diode.
 - d) How does the barrier width of a P-N junction diode change with doping profile? [2+2+2+4]
4.
 - a) Draw the output characteristic of the C-E mode of a Junction transistor and show the different regions.
 - b) What is the Load Line of a BJT amplifier? Explain with a proper diagram.
 - c) What is thermal runaway in BJT? [3+4+3]
5.
 - a) Show different current components in BJT.
 - b) Define α and β of BJT, and establish the relation between them.
 - c) Draw the small signal h-parameter equivalent circuit of a BJT. [3+4+3]
6.
 - a) Why is a Zener diode used for voltage regulation?
 - b) What is population inversion in laser?
 - c) Between BJT and FET, which one is less noisy and why? [4+3+3]
7.
 - a) State and define FET parameters.
 - b) With the help of 'neat diagrams, describe the operation of n-channel depletion and enhancement MOSFETS. [4+3+3]