FACULTY OF INFORMATICS
B.E. 2/4 (IT) I Semester (Main) Examination, December 2010
MICRO ELECTRONICS

Time : 3 Hours]

[Max. Marks : 75

Note : 1) Answer **all** questions from Part – A.
2) Answer **any five** questions from Part – B.

PART – A

(25 Marks)

1. Draw the characteristics of PN junction diode in forward and reverse bias conditions.   2

2. Mention any 3 differences between a PN diode and a Scholtky diode   3

3. Calculate β for two transistors for which $\alpha = 0.99$ and 0.98. For collector currents of 10 mA, find the base currents of the two transistors.   3

4. What is the significance of the names MOSFET and IGFET ?   2

5. Define loop gain of a feedback amplifier.   2

6. What are the advantages of negative feedback ?   3

7. Draw the collector current wave-forms for a sinusoidal input in case of class A and class B output stages.   3

8. Define power conversion efficiency of an output stage.   2

9. Define "slew rate" and "CMRR".   2

10. Draw the circuit for zero level detection using operational amplifier.   3

PART – B   (50 Marks)

11. a) Compare the properties of semi conductors, conductors and Insulators.   5

    b) Explain about limiting and clamping circuits. Draw one circuit for each with
       output waveforms.   5

12. Explain CB and CE output characteristics of a BJT and compare them.   10

13. With a neat circuit diagram, explain the operation of phase-shift oscillator   10

14. Explain the operation of class-B output stage and derive the expression for power
    conversion efficiency.   10

15. a) Explain the operation of mono stable multi-vibrator.   6

    b) Explain how Op-amp can be operated as an adder and a subtractor.   4

16. a) Explain the operation of full-wave rectifier circuit.   5

    b) Explain how MOSFET can be used as an amplifier.   5

17. Write short notes on :

    a) MOS power transistors   4

    b) Negative feedback   3

    c) Internal capacitances of MOSFET.   3