Total No. of Questions : 10] [Total No. of Printed Pages : 3

Roll No. .....

CS/IT–304

B. E. (Third Semester) EXAMINATION, Dec., 2011

(Grading/Non-Grading System)

(Common for CS & IT Engg. Branch)

ELECTRONIC DEVICES AND CIRCUITS

Time : Three Hours

Maximum Marks : { *100 (Non–Grading)* / *70 (Grading)* }

Note : Attempt any *one* question from each Unit. All questions carry equal marks.

Unit – I

1. (a) Explain the formation of the depletion layer in an unbiased *pn*-junction. How does it vary with external bias ?

   (b) Draw the V-I characteristics of a Zener diode. With the help of it explain the working of Zener diode and give its applications also.

Or

2. (a) Explain the working of a transistor as an amplifier. What factors are to be considered for selecting the operating point Q for an amplifier.

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(b) Draw the constructional diagram of light emitting diode. Discuss its working and also describe the advantages and disadvantages.

Unit – II

3. (a) Explain the effect of negative feedback on the stability, distortion noise, input resistance and output resistance.

(b) What is an oscillator ? What is the Barkhausen criterion for oscillations ? How is it used in an oscillator ?

Or

4. (a) Explain with the help of a circuit diagram the operation of a crystal oscillator. Why do these oscillators give highly stable oscillations ? Mention the applications of crystal oscillator.

(b) How are power amplifiers classified ? Explain Class A, Class B and Class AB operation. Give the applications for each *one* of them.

Unit – III

5. (a) Discuss switching characteristics of transistor and explain the working of transistor as switch with circuit diagram.

(b) Draw the circuit diagram and explain the working of astable multivibrator with waveforms.

Or

6. (a) Describe the working of differential amplifier with circuit diagram and also explain the terms :

(i) Common mode gain

(ii) Common mode rejection ratio (CMRR)

(b) Explain the advantages of Darlington pair method. Also discuss the Bootstrapping technique.

Unit – IV

7. (a) What is an Op-Amp. ? List all the ideal characteristics of Op-Amp. and explain the following terms :
   (i) slew rate
   (ii) offset voltage
   (iii) bias current
   (iv) bandwidth

   (b) Draw the circuit of a Summing Amplifier and obtain an expression for the output.

Or

8. (a) Draw the circuit of an Op-Amp. integrator and explain its working. Indicate the input and output waveforms.

   (b) With the help of circuit diagram explain the working of 555 timer. Also discuss its applications.

Unit – V

9. (a) Discuss the circuit arrangement for series voltage regulators and discuss its operation.

   (b) Describe the operation of switch mode power supply with circuit diagram. Give its merits also.

Or

10. (a) Explain the overload protection and current limiting with circuit diagram.

    (b) Discuss fixed and adjustable switching regulators in detail.