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Roll No. .....

CS/IT–304(N)

B. E. (Third Semester) EXAMINATION, June, 2010

(New Scheme)

(Common for CS & IT Engg. Branch)

ELECTRONIC DEVICES AND CIRCUITS

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt all questions. Assume any missing data.

Unit–I

1. (a) Explain the following diodes with their working, characteristics and applications :

   (i) Zener diode

   (ii) PIN diode

   (iii) Photo diode

   (b) Discuss the effect of temperature on Zener and Avalanche breakdowns.

Or

2. (a) Draw circuit diagram and explain input/output characteristics of common base configuration of BJT.

P. T. O.

(b) Explain different working regins of MOSFET. How MOSFET is different from BJT ?

Unit – II

3. (a) Explain the working of a Class – B push pull amplifier.

   (b) Discuss the principles of negative feedback in amplifiers with a neat diagram. Derive an expression for the gain and bandwidth.

Or

4. (a) Why is amplifier circuit necessary in an oscillator ? List different types of oscillator with their applications.

   (b) Draw the circuit of a Wien bridge oscillator. Discuss its working. Will oscillation take place if bridge is balanced ?

Unit – III

5. (a) With a neat sketch, explain the working of a bistable multivibrator.

   (b) Design an astable multivibrator with 50% duty cycle, $f = 3$ kHz. Assume all remaining data.

Or

6. (a) Draw a Darlington emitter follower. Explain why the input impedance in higher than that of a single stage emitter follower.

   (b) Explain bootstrapping principle and how effectively it is used to solve biasing problem in Darlington pair.

Unit – IV

7. The slew rate of an Op-Amp. is 6 V/μ s when the closed loop gain is unity. The amplified O/P signal is pure sinusoid $V_0 = V_m \cos \omega t$ provided the frequency of this signal does

not exceed a certain limit. Find the value of limiting frequency before the O/P signal is distorted by the slew rate limit if :

(a) $V_m = 1$ V

(b) $V_m = 10$ V

Or

8. (a) Draw and explain the circuit of logarithmic amplifier.

   (b) Write the application of 555 timers. Explain the circuit of current to voltage converter.

Unit – V

9. Write short notes on any *two* of the following :

   (a) SMPS

   (b) UPS

   (c) Voltage regulators

   (d) Current limiting circuits