

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

Roll No.

CS/IT-304(N)

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

(New Scheme)

(Common for CS & IT Engg. Branch)

ELECTRONIC DEVICES AND CIRCUITS

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

- Note :** (i) There are five Units. Attempt *one* question from each Unit.
(ii) All questions carry equal marks.
(iii) Assume and mention suitable missing data if any.

Unit – I

1. (a) Explain with reference to the Zener diode characteristic, Zener voltage, breakdown current and dynamic impedance. How does the dynamic impedance vary with Zener current ? 10
(b) What is PIN diode ? Why is it so called ? What is swept out voltage ? Why is it suitable as a microwave switch ? Is it operated in forward bias or in reverse bias mode ? 10

Or

2. (a) Explain the working of transistor as an amplifier. 10

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- (b) Given $h_{ie} = 2.4 \text{ k}\Omega$, $h_{fe} = 100$, $h_{re} = 4 \times 10^{-4}$ and $h_{oe} = 25 \mu\text{s}$. Sketch the common emitter equivalent model. 10

Unit – II

3. (a) Differentiate between positive and negative feedback. How does negative feedback modify the gain of an amplifier ? 10
- (b) Derive the expression for the gain of an amplifier using negative feedback. 10

Or

4. (a) Draw the circuit of a Wien bridge oscillator. Discuss its working. Will oscillation take place if bridge is balanced ? 10
- (b) A Class B push-pull amplifier is supplied with $V_{cc} = 50 \text{ V}$. The signal swings the collector voltage down to $V_{min} = 10 \text{ V}$. The dissipation in both transistors total 40 W. Find the total power and conversion efficiency. 10

Unit – III

4. (a) For a monostable multivibrator calculate the input pulse width for the design values of $R_C = 2 \text{ k}\Omega$, $R_B = 10 \text{ k}\Omega$; $C = 0.1 \mu\text{F}$, $V_{CC} = 10 \text{ V}$, $V_{BE(sat)} = 0.8 \text{ V}$. 10
- (b) Draw the circuit diagram of an astable multivibrator. Justify that it is a two stage R-C coupled amplifier using feedback. How does it give a square wave ? 10

Or

6. (a) How is transistor used as a clipper ? Draw the circuit diagram and output waveform for sinusoidal input signal. 10

- (b) Draw the circuit diagram of Darlington amplifier. Give its main characteristics, merits and applications. 10

Unit – IV

7. (a) Why current source is used in conjunction with differential amplifier ? Draw the circuit diagram. 10
(b) Draw the circuit diagram of log and antilog amplifier circuit using OP-Amp and write the expression for output voltage. 10

Or

8. (a) Using 555 timer draw the circuit of monostable multivibrator and find the expression for pulse width. 10
(b) Determine the voltage gain of an Op-Amp. instrumentation amplifier. 10

Unit – V

9. (a) Explain the working principle of a regulated power supply. 10
(b) Explain, with a neat block diagram of the internal blocks, the working of an I. C. voltage regulator. 10

Or

10. (a) For a transformer output of 24 V and a filter capacitor of 200 μ F, determine the minimum input voltage when connected to a load drawing 300 mA. 10
(b) Write the principle of voltage regulator. What do you understand by SMPS ? 10