

TEC-304

Roll No. to be filled in your Answer Book

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B.Tech. – Back Paper

ECE, Semester-III

Solid-State Device and Circuit (TEC-304)

PAPER ID-

Time- 3 Hours

Max marks: 100

**NOTE:**

- i. All questions are compulsory.
- ii. Draw diagrams wherever necessary.
- iii. All questions carry equal marks. .

I. Attempt any **FOUR** parts of the following. 5 X 4

- (A) Explain the working principle of Digital to Analog Converter?
- (B) Define the basic operation of LED?
- (C) Define basic working principle of Op-Amp?
- (D) Define Barkhausen Criterion? How it is related to Oscillator?
- (E) What is loop gain? Drive mathematical formula for loop gain?
- (F) Define the expression of gain for negative feedback system?

2. Attempt any **FOUR** parts of the following 5 X 4
- (A) Define voltage regulator? Also describe types?
  - (B) Write short note on PLL??
  - (C) Explain the concept of Hartley Oscillator?
  - (D) Describe multistage amplifier?
  - (E) Differentiate between **Varactor diode** and **tunnel diode**?
  - (F) What is shunt-series feedback amplifier?
3. Attempt any **TWO** parts of the following 10X2
- (A) What is Oscillator? Explain working and application of phase-shift oscillator?
  - (B) Explain Integrator and compensated attenuator?
  - (C) Write short note on:
    - 1. Simple Active Filter
    - 2. A/D Converter
4. Attempt any **TWO** parts of the following 10X2
- (A) Write short note on:
    - 1. Crystal Oscillator
    - 2. Sample and Hold Circuit

(B) Write down the difference between Astable, Monostable and Bi-stable multi-vibrator?

(C) What is feedback system? Define four basic topologies?

5. Attempt any **TWO** parts of the following 10 X 2

(A) What is stability problem? Discuss all the point which affect amplifier stability? Drive its mathematical expression?

(B) Define fixed and adjustable voltage IC regulator?

(C) Write short note:

1. VCO

2. IC-555 and its application

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