

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0321

Roll No.

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B.Tech

(SEMESTER-III) THEORY EXAMINATION, 2012-13

ANALOG & DIGITAL ELECTRONICS

Time : 3 Hours]

[Total Marks : 100

Note : Attempt all **three** sections as per the instructions.

SECTION – A

1. Attempt **all** questions of this section. **10 × 2 = 20**
- Define 'Dark Current' in photodiode.
 - Write any two applications of tunnel diode.
 - Explain transfer function of an amplifier.
 - Write any two disadvantages of negative feedback.
 - Write Barkhausen conditions for sustained sinusoidal oscillation.
 - Explain the applications of quartz crystal.
 - Draw the gate level diagram of T flip-flop.
 - What is priority encoder ?
 - What is amultivibrator ?
 - List the applications of SRAM.

SECTION – B

2. Attempt any **three** questions from this section : **3 × 10 = 30**
- Explain the principle and working of LED with its V-I characteristic curve.
 - Draw the equivalent circuit of BJT at high frequency and derive the expression for upper cut-off frequency.
 - Explain with the circuit diagram the working of a transistor RC phase shift oscillator. Also derive the condition of sustained oscillations.

- (d) Discuss Race Around Condition of J-K flip-flop. Show how this condition can be removed.
- (e) Explain the operation of R-2R ladder type digital to analog converter with a neat sketch.

SECTION – C

3. Attempt all **five** questions of this section. **5 × 10 = 50**
How the construction of the Schottky barrier diode is different from conventional semiconductor diode ? Describe its mode of operation.

OR

Explain the working of tunnel diode in detail with suitable diagram.

4. List the characteristics of an amplifier which are modified by negative feedback. Derive expression for the effective input and output resistance of current series feedback.

OR

Discuss the low and high frequency response of CE amplifier.

5. Explain with the circuit diagram the working of a transistor Wein-Bridge oscillator and derive the condition for sustained oscillation.

OR

Explain the properties of a quartz crystal which are responsible for its use in an oscillator.

6. Draw the logic diagram of universal shift register and explain its working.

OR

Implement the following Boolean Function using 8×1 multiplexer.

$$F(A, B, C, D) = \Sigma(2, 4, 5, 7, 10, 14)$$

7. Design and explain a circuit diagram for astable multivibrator having 50% duty cycle using IC-555.

OR

Write short note on memory organization.