

**B.TECH.****THEORY EXAMINATION (SEM-IV) 2016-17****ANALOG AND DIGITAL ELECTRONICS***Time : 3 Hours**Max. Marks : 100**Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.***SECTION-A**

- 1 Attempt all parts. (2X10=20)**
- Why Si and Ge are not preferred in LED.
  - What is Tunnel diode? Sketch its V-I characteristics and mark negative resistance region on it.
  - Write down the advantages of negative Feedback.
  - What is the necessity of Frequency response analysis?
  - What is the Barkhausen criteria?
  - Give the names of two piezoelectric materials used in the construction of Crystal Oscillator.
  - Draw the State Transition Diagram of R-S Flip Flop.
  - Realize a 16x1 multiplexer using two 8x1 multiplexers.
  - Why photodiode operates only in reverse biased?
  - Give applications of multiplexer.

**SECTION-B**

- 2 Attempt any FIVE parts. (10X5=50)**
- Explain the construction, working and application of photodiode with suitable diagrams.
  - Describe the properties of series-shunt and shunt-shunt feedback Amplifiers.
  - List five characteristics of an amplifier modified by negative feedback.
  - In a Colpitts, inductor L has a small series resistance. Find the expression for frequency of oscillation.
  - If component values are selected as  $L = 100\text{mH}$ ,  $C_1 = 10\text{pF}$ ,  $C_2 = 100\text{pF}$ ,  $r = 50\Omega$ ,  $R_0 = 2.2\Omega$ , calculate (i) Frequency of oscillation (ii) Minimum gain required for oscillation.
  - Discuss the working of Wien Bridge oscillator and derive its frequency of Oscillation.  
(i) Differentiate between Encoder and Decoder.  
(ii) Tabulate the excitation table of J-K Flip Flop
  - Explain the operation of a astable multivibrator circuit using an op-amp. Also derive the expression for cut off frequency.
  - With the help of output characteristics, show how a transistor can be used as a switch.

**SECTION-C**

- Attempt any Two parts. (15X2=50)**
- What are voltage regulators? Discuss the working of Shunt and series op-amp based voltage regulators.
  - How the construction of a Schottky barrier diode is different from conventional semiconductor diode. Explain the construction, operation and V-I characteristic of a Schottky diode.
  - Write short notes on (i) Series –Series Topology (ii) Shunt –Series Topology

