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NEC409A

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)**

- a) Why Si and Ge are not preferred in LED.
- b) What is Tunnel diode? Sketch its V-I characteristics and mark negative resistance region on it.
- c) Write down the advantages of negative Feedback.
- d) What is the necessity of Frequency response analysis?
- e) What is the Barkhausen criteria?
- f) Give the names of two piezoelectric materials used in the construction of Crystal Oscillator.
- g) Draw the State Transition Diagram of R-S Flip Flop.
- h) Realize a 16x1 multiplexer using two 8x1 multiplexers.
- i) Why photodiode operates only in reverse biased?
- j) Give applications of multiplexer.

SECTION-B**2 Attempt any FIVE parts. (10X5=50)**

- a) Explain the construction, working and application of photodiode with suitable diagrams.
- b) Describe the properties of series-shunt and shunt-shunt feedback Amplifiers.
- c) List five characteristics of an amplifier modified by negative feedback.
- d) In a Colpitts, inductor L has a small series resistance. Find the expression for frequency of oscillation.
- e) 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.
- f) 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
- g) Explain the operation of a astable multivibrator circuit using an op-amp. Also derive the expression for cut off frequency.
- h) With the help of output characteristics, show how a transistor can be used as a switch.

SECTION-C**Attempt any Two parts. (15X2=50)**

3. What are voltage regulators? Discuss the working of Shunt and series op-amp based voltage regulators.
4. 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.
5. Write short notes on (i) Series –Series Topology (ii) Shunt –Series Topology