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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 = 100mH, C_1 = 10pF, C_2 = 100pF, r = 50Ω, R_0 = 2.2Ω, 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