

Paper Id

130304

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B TECH
(SEM-III) THEORY EXAMINATION, 2018-19
ANALOG & DIGITAL ELECTRONICS

*Time: 3 Hours**Max. Marks: 70*

Note: Be precise in your answer. In case of numerical problem assume data wherever not provided.

SECTION-A**1. Attempt all of the following questions: (7×2=14)**

- (a) Convert the following number as directed:
 $(AB.CD)_{16} \rightarrow ()_2$
- (b) Draw the V-I characteristics of Tunnel Diode.
- (c) Draw the excitation table of J-K flip flop.
- (d) Write any two applications of shift register.
- (e) What are differences between Latch and Flip Flop?
- (f) What is Early Effect?
- (g) Give the comparison between LED and photodiode.

SECTION-B**2. Attempt any three of the following questions: (3×7=21)**

- (a) 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'.
- (b) Draw the low frequency small signal model in CE and CB configuration and explain significance of each model.
- (c) Explain the merits and demerits of negative feedback. Also explain in brief the various topologies used in negative feedback.
- (d) What is drawback of Colpitts oscillator? How it can be removed by Clapp oscillator?
- (e) Draw the block diagram and explain the working of universal shift register.

SECTION – C**3. Attempt any one of the following questions: (1×7=7)**

- (a) (i) Implement the following Boolean function with an 4:1 multiplexer
 $F(A, B, C, D) = \sum m(0, 2, 6, 10, 11, 12, 13) + \sum d(3, 8, 14)$
(ii) Draw a combinational logic circuit that performs both addition and subtraction operation.
- (b) (i) Converts RS flip flop to JK flip flop.
(ii) Explain the operation of a master slave JK flip flop and show how the race around condition is eliminated?

4. Attempt any one of following questions: (1×7=7)

- (a) (i) What do you mean by Negative feedback? Explain how negative feedback affects the properties of input impedance, output impedance and bandwidth?
(ii) Design a BCD to Ex-3 code converter.
- (b) (i) Explain the effect of each capacitor of CE amplifier with the gain-frequency curve. Also discuss the low frequency response of CE amplifier.
(ii) Which type of feedback is seen in Wien bridge oscillator? Compare the performance of RC oscillators and LC oscillators.

5. Attempt any one of following questions: (1×7=7)

- (a) Write a short notes on:
(i) Ring Counter
(ii) Johnson Counter
- (b) What are the differences between synchronous and asynchronous counter? Draw the logic circuit of MOD-7 ripple counter.

6. Attempt any one of following questions: (1×7=7)

- (a) Write down classification of semiconductor memories. Draw and explain the programmable logic array (PLA).
- (b) Implement the following function using PAL
- $$A(x, y, z) = \sum (1, 2, 4, 6)$$
- $$A(x, y, z) = \sum (0, 1, 6, 7)$$
- $$A(x, y, z) = \sum (2, 6)$$
- $$A(x, y, z) = \sum (1, 2, 3, 5, 7)$$

7. Attempt any one of following questions: (1×7=7)

- (a) (i) Design a Decimal to BCD Encoder circuit.
(ii) What do you mean by SOP and POS Boolean expression? Convert the following Boolean function in standard POS form:
 $F = A(A + B + C)(C + D)$
- (b) Write a short notes on:
(i) SCR
(ii) DIAC