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Page code:- U239-135 (T1)

OCTOBER 2019 INSEM (T1)

S. Y. B.TECH. (Electronics & Telecommunication) (SEMESTER - III)

COURSE NAME: Digital System Design

COURSE CODE: ETUA21185

(PATTERN 2018)

Time: [1 Hour]

[Max. Marks: 20]

(*) Instructions to candidates:

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed.
- 4) Assume suitable data where ever required.

Q 1) Attempt any **one**

- a) Simplify the given function using Quine McCluskey minimization technique [8]

$$f(A, B, C, D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 11, 14)$$

- b) Using a K-map, convert the following standard POS expression into a minimum POS expression, a standard SOP expression, and a minimum SOP expression. Draw logic diagram for minimize SOP. [8]

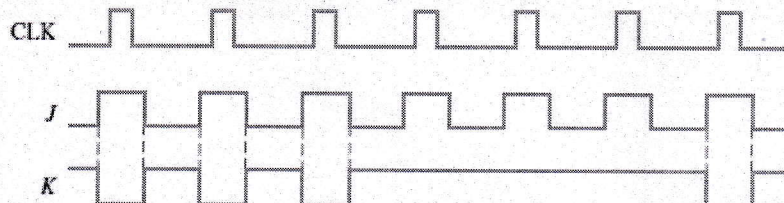
$$Y = (\bar{A} + \bar{B} + C + D)(A + \bar{B} + C + D)(A + B + C + \bar{D})(A + B + \bar{C} + \bar{D})(A + B + \bar{C} + D)$$

Q 2) Attempt any **one**

- a) What is gray code and its significance? Design 4-bit binary to gray code converter. Draw and comment on its logic diagram. [8]
- b) Design a 2-bit comparator which will compare the inputs and give outputs as $A < B$, $A = B$, $A > B$. Draw its logic diagram. [8]

Q 3) Attempt any **one**.

- a) For a negative edge triggered J-K flip-flop with the inputs in figure, develop the Q output waveform relative to the clock. Assume the Q is initially LOW. [4]



- b) Draw D flip-flop with preset and clear inputs and explains its working with suitable waveforms? [4]