

7. (a) Simplify the following expression using the tabulation method/QM method.

$$F(A, B, C, D) = \sum m(0, 2, 3, 6, 7, 8, 10, 12, 13) \quad (8)$$

- (b) Find the output for a 4-BIT successive approximation A/D converter to a 10.67 Volts input if the reference is 5V. (7)

Roll No.

Total Pages : 4

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**B.Tech. (CE/CSE/IT) - III SEMESTER
DIGITAL ELECTRONICS (ESC-302)**

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.
2. Answer any four questions from Part-B in detail.
3. Different sub-parts of a question are to be attempted adjacent to each other.

PART - A

1. (a) What are the advantages of CMOS logic families used for implementing logic gates? (1.5)
(b) Implement the Ex-OR using the NAND gate only. (1.5)
(c) What are signed integer division circuits how they are different from unsigned integer division circuits? (1.5)
(d) How Decoder is different from demultiplexer? (1.5)

- (e) Convert $(1101.110)_2$ into equivalent octal and BCD codes. (1.5)
- (f) Find $(726)_8 / (25)_8$. (1.5)
- (g) Differentiate between T and D Flip flop. (1.5)
- (h) Explain in short how synchronous counters are different from the asynchronous counter. (1.5)
- (i) What is quantization for A/D converters? (1.5)
- (j) What is sequential memory? (1.5)

PART - B

- 2. (a) Minimize the following function using K-Map
 $f(A, B, C, D) = \sum m(0, 3, 5, 8, 9, 11, 13)$
 $+ \sum d(1, 7, 12)$. (10)
- (b) What is the ring counter? How it is different from Johnson counter? (5)
- 3. (a) Design a Mod-9 counter using flip flops. (10)
- (b) What are the error detection and correction codes? How these are helpful in error detection and correction explain with the help of an example. (5)

- 4. (a) Perform the following :
 - (i) $-18 + 4 = ?$ using 2's complement method.
 - (ii) $328 - 423 = ?$ using BCD arithmetic method.
 - (iii) $(1011010)_2 \rightarrow ()_{\text{Gray code}}$
 - (iv) $(675.13)_8 \rightarrow ()_2$.
 - (v) $(18.53)_{10} \rightarrow ()_{16}$. (10)
- (b) Differentiate between serial carry and carry look-ahead adders with suitable diagrams. (5)
- 5. (a) Implement full adder using 4:1 multiplexer. (5)
- (b) Explain the interfacing between TTL and CMOS circuits. (5)
- (c) Differentiate between CPLD and FPGA. (5)
- 6. (a) Define resolution, conversion time, sensitivity and accuracy of A/D converter. (5)
- (b) What is programmable read-only memory? How it differs from RAM? (5)
- (c) Implement 2X1 Multiplexer using PLA and PAL. (5)