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BTECH
(SEM III) THEORY EXAMINATION 2023-24
DIGITAL SYSTEM DESIGN

TIME: 3HRS**M.MARKS: 100****Note:** Attempt all Sections. If require any missing data, then choose suitably.**SECTION A****1. Attempt all questions in brief.**

Q no.	Question	Marks	CO
a.	Construct full subtractor using logic gates.	2	1
b.	Convert binary code (1100000010) ₂ into gray code.	2	1
c.	Explain setup and hold time.	2	2
d.	Write the number of flip-flops required for 3-bit counter.	2	2
e.	Write the difference between excitation table and characteristic table.	2	3
f.	Define race around condition.	2	3
g.	Explain propagation delay.	2	4
h.	Explain fan in and fan out.	2	4
i.	Write the application of switched capacitor circuits.	2	5
j.	List the number of comparators and registers required for 3-bit FLASH ADC.	2	5

SECTION B**2. Attempt any three of the following:**

a.	Simplify using K map to obtain a minimum POS expression. $(A'+B'+C)(A+B'+C)(A+B+C')(A'+B+C)(A+B'+C')$	10	1
b.	State and prove De Morgan's theorem.	10	2
c.	Explain Bidirectional shift register with logic diagram.	10	3
d.	Explain memory decoding in RAM cell.	10	4
e.	Explain Flash type ADC with neat circuit diagram.	10	5

SECTION C**3. Attempt any one part of the following:**

a.	Simplify the following Boolean function $F(A, B, C, D) = \sum m(0, 2, 5, 6, 13, 15)$ using K map.	10	1
b.	Minimize $F = \sum m(0, 1, 2, 3, 5, 6, 7, 14, 15) + d(4, 11, 13)$ using Tabular Method.	10	1

4. Attempt any one part of the following:

a.	Design 5:32 line decoder using 2:1 line decoder.	10	2
b.	Design 3-bit excess-3 to BCD code converter.	10	2

5. Attempt any one part of the following:

a.	Design 4 bit UP/DOWN ripple counter.	10	3
b.	Explain universal shift register with neat diagram.	10	3

6. Attempt any one part of the following:

a.	Explain two input TTL NAND gate tristate logic with the help of neat diagram.	10	4
b.	Explain ECL as OR/NOR logic function.	10	4

7. Attempt any one part of the following:

a.	Explain R-2R DAC with a neat diagram.	10	5
b.	Discuss Switch capacitor and write its applications.	10	5