

U.G. 2nd Semester Examinations 2022

COMPUTER SCIENCE (Honours)

Paper Code : DC - 4(a)

(Digital Logic System)

Full Marks : 25

Time : Two Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

Group - A

1. Answer any *five* questions : 2×5=10
- (a) Explain the use of gray code in K-map.
 - (b) Implement a half subtractor using NAND gates only.
 - (c) What is *race around* condition?
 - (d) Differentiate between decoder and demultiplexer.
 - (e) Derive the complements of the expression : $A(B+C)(\bar{C}+\bar{D})$.
 - (f) Simplify the expression : $\bar{A}\bar{B}C + BC + AC$.

Group - B

Answer any *three* questions. 5×3=15

2. (a) Implement the following function using multiplexer :
 $F(X, Y, Z) = \sum_m(0, 2, 3, 6, 7)$
- (b) Implement 4×16 decoder using 2×4 decoders. 2+3=5
3. Design a combinational circuit that performs BCD addition. Explain the circuit briefly. 5
4. Design a sequential circuit that generates the following sequence: 3, 5, 7, 0, 3, 5, ... 5
5. Design an adder circuit that adds two 4-bit numbers serially using only one full adder block. 5
6. Write a short note on any *one* of the following : 5
- (a) Master Slave J-K Flip Flop
 - (b) Parity bit Generator
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