

H

Roll No.

TBC-204/TBI-202

**B. C. A./B. SC. (IT)
(SECOND SEMESTER)**

END SEMESTER

EXAMINATION, July/August, 2022

DIGITAL ELECTRONICS

Time : Three Hours

Maximum Marks : 100

Note : (i) All questions are compulsory.

(ii) Answer any *two* sub-questions among
(a), (b) and (c) in each main question.

(iii) Total marks in each main question are
twenty.

(iv) Each sub-question carries 10 marks.

1. (a) Convert the following : (CO1)

(i) $(652)_8 = ()_2$

(ii) $(25.32)_8 = ()_{10}$

(iii) $(6864)_{10} = ()_{16}$

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- (iv) $(1011)_2 = ()_8$
(v) $(5D2)_{16} = ()_8$
- (b) How is the error detection and correction carried out using parity method in digital data transmission? (CO1)
- (c) Explain grey code and excess-3 code. Encode the following into grey code and excess-3 code: (CO1)
- (i) 45
(ii) 26
2. (a) Simplify the following Boolean function using K map: (CO2)
- (i) $F(x, y, z) = \Sigma(1, 3, 5, 7)$
(ii) $F(A, B, C, D) = \Sigma(0, 1, 5, 8, 9)$
- (b) Draw the following logic gates with their truth tables: (CO2)
- (i) AND
(ii) XNOR
(iii) NAND
(iv) X-OR
(v) NOR

(3)

- (c) Find the standard product of sum (POS) for the logic expression $F = (A + B' C) C$. (CO2)
3. (a) Design and explain 8×1 MUX using 2×1 MUX. (CO3)
(b) Design 3×8 decoder and explain its working. (CO3)
(c) Design 4 bit binary adder/subtractor and explain its working. (CO3)
4. (a) What is meant by race around condition? How can it be avoided? (CO4)
(b) Draw the logic diagram of J-K flip flop and explain it. What is the advantage of J-K flip flop over S-R flip flop? (CO4)
(c) What are registers and its types? (CO4)
5. (a) Explain a 3 bit asynchronous up counter. Draw the timing diagram and truth table. (CO5)
(b) Explain the PIPO and PISO shift register with relevant logic diagram. (CO5)
(c) Design and explain ring counter. (CO5)