

**2024/FYUG/EVEN/SEM/
BVITDSC-152T/150**

FYUG Even Semester Exam., 2024

**BACHELOR OF VOCATIONAL COURSE
(INFORMATION TECHNOLOGY)**

(2nd Semester)

Course No. : BVITDSC-152T

(Introduction to Digital Electronics)

Full Marks : 35

Pass Marks : 14

Time : 2 hours

***The figures in the margin indicate full marks
for the questions***

SECTION—A

Answer any five of the following questions : $2 \times 5 = 10$

- 1. Define binary number system with example.**
- 2. What is an error correction code?**
- 3. What is binary arithmetic?**
- 4. State the four basic cases of binary addition.**

MISCELLANEOUS (2)

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5. Define OR gate. Write down the truth table for OR gate.
6. What is meant by universal logic gate?
7. Distinguish between minterm and maxterm.
8. What do you mean by 'don't care condition'?
9. Define BCD adder.
10. Define sequential circuits with example.

SECTION—B

Answer any five of the following questions : $5 \times 5 = 25$

11. Explain decimal number system to binary number system with suitable example.
12. Convert the following binary number into equivalent decimal number :
 - (a) $(100010)_2$
 - (b) $(1001101010)_2$
 - (c) $(111011)_2$
 - (d) $(1010101001)_2$
 - (e) $(10000100)_2$

(13)

13. Write down the steps for subtraction using 1's complement. Perform $(9)_{10} - (4)_{10}$ using 1's complement method.
14. Perform the following :
 - (a) $(10101)_2 + (10111)_2$
 - (b) $(11101)_2 + (101010)_2$
 - (c) $(11111)_2 - (10111)_2$
 - (d) $(1011)_2 * (111)_2$
 - (e) $(1110)_2 / (10)_2$

15. State and prove De Morgan's theorem and realize with the basic gates.

16. Draw the logic diagram for the following Boolean expression :

(a) $A + BD + \bar{D}$

(b) $\overline{(A+B)}(C+D)\bar{C}$

17. Draw the K-map and find the minimized Boolean expressions of the following :

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

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18. Explain the process of grouping of four adjacent 1's in K-map with example.
19. What is arithmetic adder? Explain with example.
20. What is flip-flop? Explain the implementation of S-R flip-flop using NOR gate.
