

KAMARAJ COLLEGE (Autonomous)

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(3 Pages)

Reg. No:.....

Question Code: 26E02004

Course Code: 24UECA21

UG Degree - End Semester Examinations, April 2026

Second Semester

B.C.A

Digital Logic Fundamentals

(For those who joined in July 2024 onwards)

Time : 3Hours

Maximum : 75 Marks

PART - A ($10 \times 1 = 10$ Marks)

Answer ALL Questions

Choose the correct answer :

- CO:1 1. The 9's complement of 012398 is _____.
- K:1 (a) 987602 (b) 893210
(c) 987601 (d) 206789
- CO:1 2. _____ deals with binary variables and logic operations.
- K:1 (a) Boolean algebra (b) Logic gates
(c) Associative law (d) Register
- CO:2 3. The algebraic function for NOR gate is _____.
- K:2 (a) $F=(xy)'$ (b) $F=(x+y)'$
(c) $F=x'+y$ (d) $F=x+y'$
- CO:2 4. The _____ gate is said to be a universal gate.
- K:2 (a) NOR (b) XOR
(c) NAND (d) All the above
- CO:3 5. The largest possible group in a 4-variable K-Map is _____.
- K:2 (a) 2 (b) 4
(c) 8 (d) 16
- CO:3 6. A pair group in K-Map eliminates _____ variables.
- K:1 (a) 1 (b) 2
(c) 3 (d) 4

- CO:4 7. The output of half adder is _____
K:2 (a) Sum (b) Carry
(c) Both (a) and (b) (d) None of the above
- CO:4 8. A decimal adder is used to add _____ numbers.
K:1 (a) Binary (b) BCD
(c) Octal (d) Hexadecimal
- CO:5 9. An encoder performs the reverse operation of _____.
K:2 (a) Decoder (b) Multiplexer
(c) Demultiplexer (d) Adder
- CO:5 10. The T flip-flop is mainly used in _____.
K:2 (a) Adders (b) Counters
(c) Encoder (d) Decoder

PART - B (5 X 5 = 25 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 250 words.

- CO:1 11. (a) Solve the following:
K:3 (i) Convert $(0.513)_{10}$ to octal.
(ii) Using 10's complement, subtract $72532 - 3250$.
(OR)
(b) Examine the basic definitions in Boolean algebra.
- CO:2 12. (a) Distinguish sum of min terms and product of min terms.
K:4 **(OR)**
(b) Analyze multilevel NAND circuits.
- CO:3 13. (a) Construct two-variable and three-variable K-Map.
K:3 **(OR)**
(b) Experiment with don't care conditions.
- CO:4 14. (a) Discuss about combinational circuits.
K:4 **(OR)**
(b) Examine a binary multiplier.
- CO:5 15. (a) Examine the decoder.
K:4 **(OR)**

(b) Analyze Edge-Triggered D Flip-Flop

PART - C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 500 words.

CO:1 16. (a) Explain complements of numbers with example.

K:5

(OR)

(b) Determine boolean functions.

CO:2 17. (a) Construct any five digital logic gates.

K:6

(OR)

(b) Elaborate exclusive OR function.

CO:3 18. (a) Examine Four-variable K-Map.

K:4

(OR)

(b) Explain product of sums simplification.

CO:4 19. (a) Classify half adders and full adders.

K:3

(OR)

(b) Construct BCD adder.

CO:5 20. (a) Examine the Multiplexers.

K:4

(OR)

(b) Analyze the need for latches as storage elements.