(6 pages) **Reg. No. :** .....

Code No. : 20685 E **Sub. Code : FECS 11**

B.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2025.

First Semester

Computer Science

Elective – DIGITAL LOGIC FUNDAMENTALS

(For those who joined in July 2024 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1 $(65535)_{10}$ is equivalent to hexadecimal _____

(a) 1111 1111 1111 1111

(b) 177777

(c) FFFF

(d) 524280

2 Which of the following is a seven bit code?

(a) BCD (b) ASCII

(c) EBCDIC (d) Excess-3 code

3. What is A + BC?

(a) AB + AC (b) A + B

(c) A+ B + C (d) (A + (B) (A + (C)

4. _____ circuit is a logic circuit that is the logical sum of the fundamental products that produce high output in the truth table.

(a) NOR-NOR (b) OR-AND

(c) NAND-NAND (d) AND- NOT

5. The octal equivalent of 1011,01101 is

(a) 9.2625 (b) 13.32

(c) 11.2625 (d) 11.68

6. Which of the following is a circuit with no data input?

(a) Multiplexer (b) Demultiplexer

(c) Decoder (d) Encoder

7. In S-R flip-flop, if Q = 1, the output is said to be _____

(a) Set

(b) Reset

(c) Previous state

(d) Current state

8. Which of the following flipflop has only one input?

(a) D (b) RS

(c) JK (d) SR

9. Which of the following are used to store binary data?

(a) Logic gates (b) Multiplexer

(c) Counter (d) Register

10 In serial shift registers, data shifting occurs _____

(a) 1 bit at a time

(b) Simultaneously

(c) Two bit at a time

(d) Four bit at a time

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Convert $(F8E6.39)_{16}$ to octal.

Or

(b) Give the logic circuit, symbol and truth table of AND gate.

12. (a) Write a note on pairs, quads and octets.

Or

(b) Suppose a truth table has a low output for the first three input conditions 000, 001 and 010. If all other inputs are high, draw the Product of Sums circuit.

13. (a) Give an account of decoder

Or

(b) Subtract

$(+14)_{10} - (-108)_{10}$ in binary.

14 (a) Give an account of flipflops.

Or

(b) Write notes on Edge triggered D flip flop.

15. (a) Briefly explain Serial-in Serial out Shift register.

Or

(b) Give the sketch of a Parallel in Serial Out Shift register.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Convert

(i) Hexadecimal DAOC to binary

(ii) Hexadecimal F8E6.39 to decimal.

Or

(b) Explain Gray code.

17. (a) Simplify and draw SOP and POS circuit

$Y = \Sigma m(9) + d(10,11,12,13,14,15)$.

Or

(b) Simplify using Karnaugh map and draw the Sum of Products circuit

$F(A, B, C) = \Sigma m(3,5,6,7)$

18. (a) With a neat diagram explain the working of a multiplexer.

Or

(b) Perform the following binary arithmetic:

(i) $(-43)_{10} + (-78)_{10}$

(ii) $(-43)_{10} - (-78)_{10}$

19. (a) Expound edge triggered RS Flipflop.

Or

(b) Explain JK master slave flipflop.

20. (a) Explain Parallel-in Parallel out Shift Register

Or

(b) Explain Universal Shift Register.

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(6 pages) Reg. No. : .....

Code No. : 20689 E **Sub. Code : FFCS 11**

B.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2025

First Semester

Computer Science

Foundation Course - PROBLEM SOLVING TECHNIQUES

(For those who joined in July 2024 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. First generation computers used ————
   (a) VLSI technique
   (b) Transistors
   (c) Vacuum tubes
   (d) Integrated circuits

2. Which of the following is not input device.
   (a) Touch pad (b) Mouse
   (c) Printer (d) Keyboard

3. Users write the programs in ———— language
   (a) Low-level (b) High-level
   (c) Machine-level (d) Decimal format

4. ▭ Symbol is used for ————
   (a) Decision (b) Input/Output
   (c) Terminal (d) Process

5. Terminal symbol in a flowchart indicates
   (a) End (b) Processing
   (c) Input and output (d) Decision

6. Which of the following is not a basic control structure?
   (a) The process (b) The decision
   (c) The loop (d) The sequential

7. Pseudo code is also known as
   (a) Program Design Language
   (b) Hardware Language
   (c) Software Language
   (d) Algorithm

8. Flowcharts and Algorithms are used for
   (a) Better Programming
   (b) Easy testing and debugging
   (c) Efficient coding
   (d) All

9 What is the highest index for an array with 10 elements?
   (a) 5 (b) 9
   (c) 10 (d) 11

10. Which loop type repeats a block of code as long as a specified condition is true?
   (a) For loop
   (b) While loop
   (c) Do-while loop
   (d) Foreach loop

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Explain generations of a computer.

Or

(b) Explain about the System Software.

12. (a) Depicts features of good programming language.

Or

(b) Write a note on Assembly language.

13. (a) Write a note on applications of repetition structures.

Or

(b) Describe advantages and limitation of flowcharts.

14. (a) Explain the type of errors.

Or

(b) Write short notes on Relational operators.

15. (a) Explain the application of selection structures.

Or

(b) Write about one dimensional array with example.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 600 words.

16. (a) Discuss block diagram of computers in detail.

Or

(b) Explain about input and output devices.

17. (a) Explain the different phases in program development cycle.

Or

(b) Explain the Interpreters and Compilers.

18. (a) Draw flowchart to find factorial of a number.

Or

(b) Write about merits and demerits of algorithm.

19. (a) Describe about controlled loops with examples.

Or

(b) Explain selecting from several alternatives with an example.

20. (a) Explain two dimensional array with example.

Or

(b) Write an algorithm to print the following output:

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5