

SAMPLE PAPERS
DIPLOMA FIRST SEMESTER EXAMINATION 2025 (JUT)
FUNDAMENTAL OF COMPUTER (FOC)
DIPLOMA WALLAH

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Full Marks: 70 | **Time:** 3 Hours

Instructions:

1. Question No. 1 is **compulsory**.
 2. Answer any **FOUR** questions from the remaining (Q. 2 to Q. 7).
 3. All questions carry equal marks (14 marks each).
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Q.1 [Compulsory] Answer all Multiple Choice Questions: [2 × 7 = 14]

- (i) What is the base of the Hexadecimal number system?
(A) 2 (B) 8 (C) 10 (D) 16
- (ii) In a flowchart, which symbol represents a processing step?
(A) Oval (B) Parallelogram (C) Rectangle (D) Diamond
- (iii) 1 Byte consists of how many bits?
(A) 4 bits (B) 8 bits (C) 16 bits (D) 32 bits
- (iv) Which of the following is considered "Primary Memory"?
(A) Hard Disk (B) RAM (C) CD-ROM (D) Pendrive
- (v) Which logic gate produces a HIGH (1) output only when both inputs are HIGH?
(A) OR (B) AND (C) NOT (D) XOR
- (vi) What is the full form of WAN?
(A) Wireless Area Network (B) Wide Area Network (C) Web Area Network (D) None
- (vii) Which computer generation used Transistors?
(A) 1st Gen (B) 2nd Gen (C) 3rd Gen (D) 4th Gen

Q.2 (A) Explain Binary, Octal, Decimal, and Hexadecimal number systems. [7 MARKS]

(B) Perform $(110101)_2 - (10111)_2$ using **2's complement** method. [7 MARKS]

Q.3 (A) State and prove **De-Morgan's Laws** using truth tables. [7 MARKS]

(B) Simplify the Boolean expression: $F = AB + A(B+C) + B(B+C)$. [7 MARKS]

Q.4 (A) Why are NAND and NOR called **Universal Gates**? Explain with truth tables. [7 MARKS]

(B) Design a **Full Adder** circuit with its logic diagram and truth table. [7 MARKS]

Q.5 (A) Draw and explain the **Functional Block Diagram** of a computer system. [7 MARKS]

(B) Explain the role of the **ALU** and **Control Unit (CU)** in detail. [7 MARKS]

Q.6 (A) Define **Algorithm** and **Flowchart**. List the advantages of flowcharts. [7 MARKS]

(B) Differentiate between **System Software** and **Application Software**. [7 MARKS]

Q.7 Write short notes on any FOUR: [$3.5 \times 4 = 14$]

(a) BCD vs ASCII codes

(b) BIOS functions

(c) Cache Memory

(d) 1's and 2's Complement

(e) Computer Viruses and Phishing



SOLUTIONS – PAPER 1

- **MCQ Key:** (i) D, (ii) C, (iii) B, (iv) B, (v) B, (vi) B, (vii) B.
 - **Q.2B Hint:** 2's complement of 010111 is 101001. Add it to 110101, discard the carry.
Result: 011110.
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