

First Year Examination of the Three Year

Degree Course, 2001

(Faculty of Science)

COMPUTER SCIENCE

First Paper

(Digital Electronics)

Time - Three Hours

Maximum Marks - 50

Attempt **FIVE** questions in all,
choosing **ONE** question from each unit.

UNIT I

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|----|-----|---|---|
| 1. | (a) | Convert the decimal number 45:3125 into binary number. | 3 |
| | (b) | Convert the octal number 5276.12 ₈ into binary number. | 3 |
| | (c) | Subtract 110000 ₂ from 10011 ₂ using either 1's complement or 2's complement. | 4 |
| 2. | (a) | What is a BCD Code? Express 1472 into BCD code. | 3 |
| | (b) | Find largest +ve and -ve numbers with 8 bits. | 2 |
| | (c) | Write one important difference between ASCII and EBCDIC Codes. | 2 |
| | (d) | Express decimal number -24 in 8 bit's complement form. | 3 |

UNIT II

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|----|-----|--|--|
| 3. | (a) | State and prove De Morgan's theorems for two inputs. | |
| | (b) | Simplify the Boolean expression to its simplest form:
$[AB+BD)+ AB)$ | |
| | (c) | A circuit has three inputs A, B and C. Show its truth table if its output Z is :
$Z = (A+B) (A+C)$
Draw its logic diagram. | |
| 4. | (a) | Use a Karnaugh map to reduce the following expression to a minimum of products from :-
$X= ABC+ABC+ABC+ABC+ABC.$ | |
| | (a) | Draw the logic circuit represented by the expression :
$AB (C + D).$ | |

UNIT III

5. (a) Explain the working of a NAND gate RS Flip - Flop. Give its truth table and times diagrams.
(b) Discss the working of a pulsed Master-Slave JK Flip-Flop circuit.
6. (a) With the help of a neat circuit, explain the working of a bi-directional shift register.
(b) Describe the difference between the serial and parallel methods of entering data into a register.

UNIT IV

7. (a) What re asynchronous and synchronous counters? Explain them giving examples.
(b) Discuss the working, circuit and timing diagrams of a 3-bit asynchronous binary counter.
8. (a) What is the basic diadvantage of an asynchronous counter?
(b) Disccu the working, circuit and timeing diagrams of EITHER a decade synchronous counter OR that of a decade asynchronous counter.

UNIT V

9. Discuss the application of XOR gates in:
 - (i) Half adder
 - (ii) Comparator
 - (iii) Parity checker and generator.
10. Write notes on any **TWO** of the following :-
 - (a) Multiplexer ciruits.
 - (b) Encoder cirucits
 - (c) Decodercircuits.