23ITU314

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2024
(Third Semester)

Branch – **INFORMATION TECHNOLOGY**

FUNDAMENTALS OF DIGITAL COMPUTERS

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1 What is the value of $(1101)_2$ in decimal number system?
(i) $(13)_{10}$ (ii) $(12)_{10}$
(iii) $(10)_{10}$ (iv) $(15)_{10}$

2 The karnaugh map (K-map) technique provides a systematic method for simplifying_____.
(i) Multiplexers (ii) Logic Gates
(iii) Counters (iv) Boolean expression

3 The number of inputs in a half adder is _____.
(i) 8 (ii) 2
(iii) 11 (iv) 32

4 Which of the following is not a sequential circuit?
(i) Flip flop (ii) Counter
(iii) Shift register (iv) Multiplexer

5 The fastest data access is provided using _____.
(i) Cache (ii) DRAM's
(iii) SRAM's (iv) Registers

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a Write short notes on binary codes.
OR
b Discuss the binary logic operations with its truth table.

7 a State the duality principle.
OR
b Justify the graphic symbols of NAND & NOR gate.

8 a Write short notes on full adder.
OR
b Bring out the neat sketch for design BCD to decimal decoder.

9 a Describe the block diagram for sequential circuit.
OR
b Discuss the functions used in shift register.

10 a Classify the modes of data transfer.
OR
b Distinguish RAM and ROM.

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11 a Convert the following:
(i) $(673.124)_8 = (?)_2$
(ii) $(306.D)_{16} = (?)_2$

OR

b Classify the symbols for circuit of logic gates.

12 a Point out the axiomatic definition of Boolean algebra.

OR

b Simplify the Boolean function:
$F(W,X,Y,Z) = \sum(0,1,2,4,5,6,8,9,12,13,14)$

13 a Implement a full subtractor with two half subtractor and an OR gate.

OR

b Explain the block diagram of BCD Adder.

14 a Briefly explain the triggering of flip flops.

OR

b Distinguish synchronous counters with ripple counters.

15 a Compare synchronous and asynchronous data transfer.

OR

b Highlight the relationship between address and memory space in a virtual memory system.

Z-Z-Z END