18SSP10

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2022
(Second Semester)

Branch –**SOFTWARE SYSTEMS**
(Five year integrated)

FUNDAMENTALS OF DIGITAL COMPUTERS AND ARCHITECTURE

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 x 1 = 10)

1 _____ sets of logic gates are known as universal gates.
(i) NOR, NAND (ii) NOR, NAND, XNOR
(iii) OR, NOT, XOR (iv) XOR, NAND, OR

2 The following hexadecimal number $(1E.43)_{16}$ is equivalent to _____.
(i) $(35.206)_8$ (ii) $(35.506)_8$
(iii) $(36.206)_8$ (iv) $(36.506)_8$

3 The addition of binary number 101001+ 010011= _____.
(i) 000111 (ii) 010100
(iii)101110 (iv) 111100

4 _____ bits are needed to store one BCD digit.
(i) 1 bit (ii) 2 bits
(iii) 3 bits (iv) 4 bits

5 A simple parity check code can detect _____ of errors.
(i) an even number (ii) an odd number
(iii) two (iv) zero number

6 The _____ of errors is more difficult than the _____.
(i) correction, detection (ii) creation, correction
(iii) creation, detection (iv) detection, correction

7 Stacks are based on _____.
(i) FIFO or LIFO (ii) LIFO or FILO
(iii) FIFO (iv) FIFO or LILO

8 In an instruction the address part points to the address of actual data, then the addressing mode is _____ addressing.
(i) direct (ii) immediate
(iii) indirect (iv) relative

9 DMA transfers are performed by a control circuit called as _____.
(i) data controller (ii) device interface
(iii) DMA controller (iv) data interface

10 _____ is a volatile memory.
(i) Cache memory (ii) CD
(iii) DVD (iv) Hard disk

Cont...

SECTION - B (25 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 5 = 25)

11 a Convert the following to decimal.
(i) $(11011.1101)_2$
(ii) $(736.4)_8$

OR

b Elucidate the properties of Boolean algebra.

12 a Draw the circuit for BCD adder and explain its operations.

OR

b What do you mean by a Multiplexer? Describe 4x1 multiplexer using AND gate.

13 a Explain 1's and 2's Complement with relevant example.

OR

b Write a detail note on memory transfers.

14 a Discuss about register organization.

OR

b Elucidate stack organization with necessary diagram.

15 a What is cache memory? Discuss its advantages.

OR

b Explicate serial communication with example.

SECTION -C (40 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 8 = 40)
Question no. 16 is compulsory

16 Explain Digital logic gates with logic diagram and truth table.

17 a How do you find the product of sum using k-map? Explain.

OR

b Design 3 bit binary counter using JK flip flop.

18 a Elucidate error detection codes with relevant example.

OR

b Write a note on shift micro-operations with example.

19 a Discuss three and two address instructions with example.

OR

b Compare different types of addressing modes with relevant example.

20 a Describe DMA controller with block diagram.

OR

b Explicate Memory management hardware with example.

Z-Z-Z

END