OLD

2015

Part-I   3-Tier

COMPUTER SCIENCE

PAPER—I

(General)

Full Marks : 100

Time : 3 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Group A

1. (a) What is a full adder ? Give truth table, Boolean expression and Corresponding logic circuit of a full adder ?

   (b) What is R – S flip - flop ? Explain working of a clocked R - S flip - flop with circuit diagram.

   $(2+2+2+2)+(2+5)$

(Turn Over)

2. (a) Write the algorithim of binary search and find its Complexity.

(b) What is stack? Write the algorithm of PUSH and POP operation in stack.

(c) Write down the advantages of Linked list over array.

$(4+2)+(2+2+2)+3$

3. (a) Explain different types of loops in C.

(b) Write a C program to find the sum of digits of a number.

(c) What is an array ? How a two dimensional array is declared and initialized in C ?

(d) What is the Conditional Operator?

$6+4+(1+2)+2$

Group B

Answer any *five* : 5×8

4. What do you mean by algorithim ? What is flow chart? Describe the basic properties of a good algorithim. 2+2+4

5. *What is the function of* ALU ? What are different Components of a Computer? Write difference between primary memory and secondary memory. 2+4+2

6. (i) Simplify the boolean expression :

$$F(A,B,C,D) = \sum (7,13,14,15)$$

(ii) Design a half subtractor using NAND gates only with its truth table. 4+4

7. (i) Give description on flag register of 8085 microprocessor.

(ii) Describe different steps during execution of instruction A, B. 4+4

8. (i) Write a C program to find factorial of a given number using recursion.

(ii) Write the difference between i++ and ++i. 5+3

9. (i) Write down the bubble sort algorithim and find its time Complexity.

C/15/B.Sc./Part-I(G)/3T(O)/Comp.Sc./1 *(Turn Over)*

(ii) What is queue ?   6+2

10. (i) Perform the subtraction (10010 – 10011) using is comple-
       ment and i s complement.

(ii) Prove that $AB + \overline{A}B + BC = AB + \overline{A}B$

(iii) Simplify : $x' + y' + xyz'$ 4+2+2

11. (i) What is universal gate? Discuss with example.

(ii) What is BCD code?   6+2

Group C

Answer any *five* :   5×4

12. (i) Write the difference between RAM and ROM.

(ii) What are nibble and word ?   3+1

13. (i) Find the complement of the given expression

$$x' \left(y' + z'\right) \left(x + y + z'\right)$$

(ii) *Describe the Demorgan's* theorem. 2+2

14. (i) Determine the canonical sum of product representation of the function of

$$f(x,y,z) = z + (x' + y)(x + y')$$

(ii) Given that $(16)_{10} = (100)_b$, determine the value 'b'.

2+2

15. What are the basic data types and sizes supported in C ?

4

16. (i) What is the difference between a positional and non-positional number system? Discuss with example.

(ii) Convert $(23 \cdot 08125)_{10} = (\,?\,)_2$ 2+2

17. Design a combination circuit using NAND gates only for $A'BC + ABC' + ABC$.

4

18. (i) What is conditional operator in C.

(ii) If p = 5, then find (p++) + (++p).   2+2

19. Write a short note on dot-matrix printer.   4