

2021
COMPUTER SCIENCE
[HONOURS]
Paper : II

Full Marks : 50

Time : 2 Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any **two** questions: 1×2=2
- a) What is the range of signed integers in C language?
 - b) Differentiate between pointer and pointer to pointer in C.
 - c) Compute 100-125 using 9's complement.
 - d) How many Half adders are required to add two n bit numbers?
2. Answer any **five** questions: 2×5=10
- a) How do you construct a D-flip-flop from JK flip-flop?
 - b) Differentiate between $\text{int}*/()$ and $\text{int}(*f)()$.

[Turn over]

- c) Write down the effect of $*p++$ when p is a pointer to integer.
 - d) How can you pass an array to a function?
 - e) What is the difference between a while loop and a do-while loop?
 - f) What is demultiplexer?
 - g) Implement NOR operation with the help of NAND gates.
 - h) Perform the following conversion:
 - i) $(0110010)_2 = (?)_8$
 - ii) $(F3A7C2)_{16} = (?)_8$
 - i) Show that
 - i) $zx + zx'y = z(x + y)$
 - ii) $(A + B)' \cdot (A' + B)' = 0$
3. Answer any **three** questions: 6×3=18
- a) Draw a flow chart to find the sum of N numbers of a Fibonacci Series.
 - b) Draw the logic circuit of the simplified form of the expression

$$F(A, B, C, D) = \sum(1, 3, 7, 11, 13, 15)$$
 using K-Map.

62(Sc)

[2]

- c) Write a C program to convert

$$a + (b * c) - d$$
into post-fix expression using stack.
- d) State three laws of Boolean algebra.
- e) Write a C program to find first five prime number in the series.

4. Answer any **two** questions: 10×2=20

- a) i) Draw and explain the circuit of a Controlled Shift register.
- ii) Draw and explain the function of a Synchronous Counter. 5+5=10
- b) i) Discuss DA and AD Converter with proper circuit diagram.
- ii) Discuss PLA with a suitable circuit diagram. 5+5=10
- c) Write a complete program for the following:
4+3+3=10
 - i) Create a link list
 - ii) Append a node at the end of the list
 - iii) Display the list in reverse order

- d) Write down program for the following:
5+5=10
 - i) Find out the number of 0s in the binary representation of an integer.
 - ii) Check whether binary representation of an integer is a Palindrome or not.
