2021

COMPUTER SCIENCE — GENERAL

Paper : GE/CC-1

Full Marks : 50

The figures in the margin indicate full marks.

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

Answer ***question no.* 1** and ***any four*** questions from the rest.

1. Answer ***any five*** questions of the following : 2×5

(a) Why is cache memory used?

(b) What do you understand by pseudocodes?

(c) What is computer virus?

(d) Which gates are called universal gates? Why?

(e) Convert $(101111000110)_2$ to octal and hexadecimal.

(f) Draw the logic diagram of a half-adder.

(g) Define flip-flops.

(h) What is preprocessor?

2. (a) Differentiate between high level and low level languages.

(b) Design a carry look ahead adder (4 bit).

(c) Explain the concepts of line editor and screen editor. 4+2+(2+2)

3. (a) Given two binary numbers X = 1011011 and Y = 1001101. Perform (X – Y) using

(i) 2's complement, (ii) 1's complement.

(b) Simplify $xyz + x'y + xyz'$ to minimum number of literals using laws of Boolean algebra.

(c) State and prove De Morgan's laws of Boolean algebra using truth tables. (2+2)+2+4

4. (a) Given the following Boolean function :

$F(A, B, C, D) = \sum m(0, 1, 2, 5, 8, 9, 10, 13)$

(i) Draw the *K*-Map.

(ii) Group *K*-Map properly.

(iii) Find minimized expression.

(b) Draw block diagram of a 4X1 MUX and explain its operation. (2+1+2)+5

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5. (a) State an advantage and disadvantage of carry look ahead adder over ripple adder.

(b) Explain the working of a 3-to-8 line decoder with the help of a logic diagram.

(c) What is a priority encoder? 2+5+3

6. (a) Differentiate between synchronous sequential circuit and asynchronous sequential circuit.

(b) Write differences between sequential and combinational circuits.

(c) State the functionality of comparator circuit. 4+4+2

7. (a) Consider a J-K flip-flop :

(i) Draw its logic diagram

(ii) Write its characteristic equation.

(iii) Draw its characteristic table.

(iv) Draw its excitation table.

(b) What are shift registers? (2+1+2+2)+3

8. Write short notes on ***any two*** of the following : 5×2

(a) Generation of computers

(b) Hamming Code

(c) BCD Adder

(d) Assemblers.