

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

Please Turn Over

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.
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