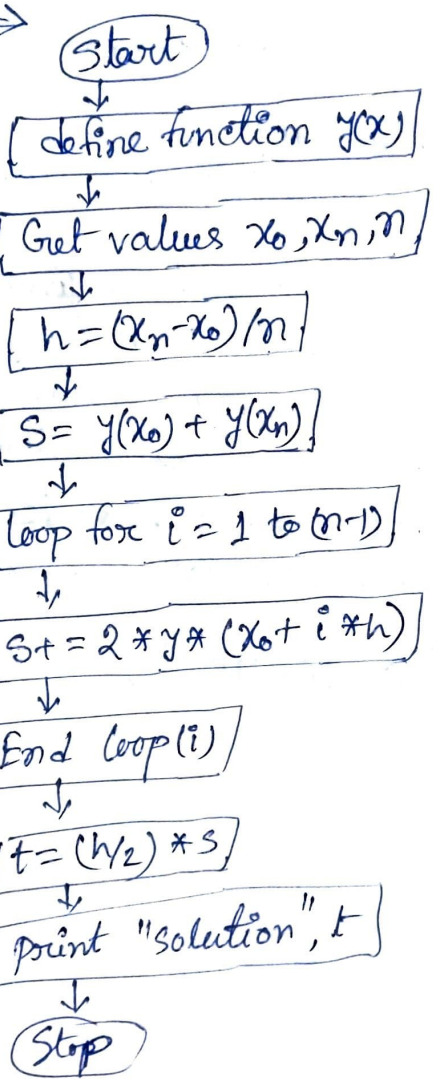
CSE-2019 → Paper II

5(e) Draw a flow chart and write a BASIC algorithm (in FORTRAN/C/C++) for evaluating, $y = \int_0^6 \frac{dx}{1+x^2}$ using Trapezoidal rule.

⇒ Flow chart ⇒



Algorithm ⇒

Step 1. Start the program.
Step 2. Input lower limit
Step 3. Input upper limit
Step 4. Input no. of subintervals n.
Step 5. h = (b-a)/n
Step 6. sum = 0
Step 7. sum = f(a) + f(b)
Step 8. for i = 1; i < n; i++
Step 9. Sum += 2 * f(a+i)

Step 10. End loop i
step 11. result = sum * h/2
step 12. print output result
step 13. End of program
step 14. Start of section function
step 15. temp = 1/(1+(x**x))
step 16. Return temp
step 17. End of section function.

6)(b) Find the equivalent numbers given in a specified number to the system mentioned against them:
(i) Integer 524 in binary system.
(ii) 101010110101.10110101 to octal system.
(iii) decimal number 5280 to hexadecimal number
(iv) Find the unknown no. $(1101.101)_8 \rightarrow (?)_{10}$

⇒(i) $(524)_{10} = (1000001100)_2$

2	524	
2	262	– 0
2	131	– 0
2	65	– 1
2	32	– 1
2	16	– 0
2	8	– 0
2	4	– 0
2	2	– 0
	1	– 0

(ii) $(101\ 010\ 110\ 101 \cdot 101\ 101\ 011)_2 = (5265.553)_8$
5 2 6 5 . 5 5 3

(iii) $(5280)_{10} = (14A0)_{16}$

16	5280	
16	330	– 0
16	20	– A
	1	– 1

(iv) $(1101.101)_8 = 1\times8^3+1\times8^2+0\times8^1+1\times8^0+1\times8^{-1}+0\times8^{-2}+1\times8^{-3}$

$= 512+64+0+1+0.125+0+0.001953125$

$= 577.126953125$

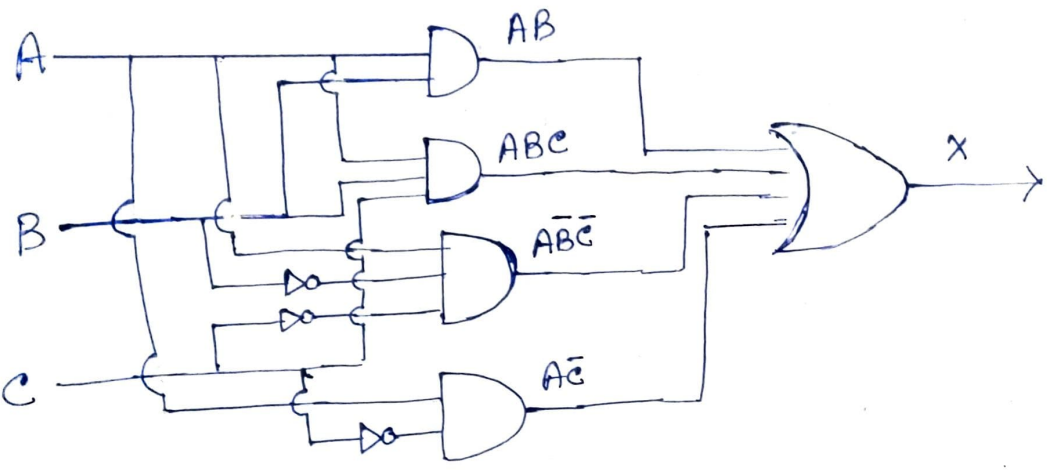
8(a) Given Boolean expression

$X = AB + ABC + A\bar{B}\bar{C} + A\bar{C}$

(i) Draw the logical diagram for the expression.

(ii) Minimize the expression.

(iii) Draw the logical diagram for the reduced expression.



ii) $X = AB + ABC + A\bar{B}\bar{C} + A\bar{C}$

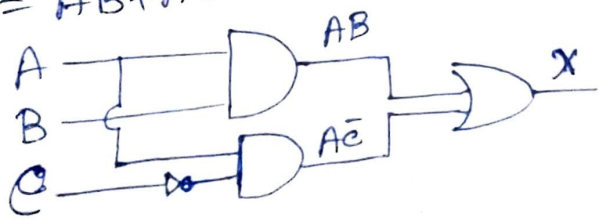
$= AB(1+C) + A\bar{C}(\bar{B}+1)$

$= AB + A\bar{C}$ $\quad [\because 1+A = 1+\bar{A} = 1]$

or

$A(B+\bar{C})$

If $X = AB + A\bar{C}$



or $X = A(B+\bar{C})$