CSE-2018 → Paper II

5)(c) Write down the basic algorithm for solving the question: $xe^x - 1 = 0$ by bisection method, Correct to four decimal places.

⇒ Algorithm ⇒

step 1 : start the program
step 2 : Input the variable x1, x2. for the task
step 3 : check f(x1) * f(x2) < 0
step 4 : If yes, proceed
step 5 : If no exist print the error message.
step 6 : Repeat 7 to 11 if conditions are not satisfied
step 7 : x0 = (x1 + x2)/2
step 8 : If f(x0) * f(x1) < 0
step 9 : x2 = x0
step 10 : else
step 11 : x1 = x0
step 12 : condition
step 13 : |(x1 - x2)/x1| < maximum possible error or f(x0) = 0
step 14 : print output.
step 15 : End of program.

6) (b) Find the equivalent numbers given in a specified number system to the system mentioned against them,

(i) $(111011.101)_2$ to decimal system.

(ii) $(1000111110000.00101100)_2$ to hexadecimal system

(iii) $(C4F2)_{16}$ to decimal system.

(iv) $(418)_{10}$ to binary system.

⇒ (i) $(111011.101)_2 = 1\times2^5 + 1\times2^4 + 1\times2^3 + 0\times2^2 + 1\times2^1 + 1\times2^0 + 1\times2^{-1} + 0\times2^{-2} + 1\times2^{-3}$

$= 32 + 16 + 8 + 2 + 1 + 0.5 + 0.125$

$= (59.625)_{10}$

(ii) $(1000111110000.00101100)_2 = (11F0.2C)_{16}$

0001 0001 1111 0000 . 0010 1100

1 1 F 0 . 2 C

(iii) $(C4F2)_{16} = C\times16^3 + 4\times16^2 + F\times16^1 + 2\times16^0$

$= 12\times16^3 + 4\times16^2 + 15\times16 + 2\times1$

$= 49152 + 1024 + 240 + 2$

$= (50418)_{10}$

(iv) $(418)_{10} = (110100010)_2$

2	418	
2	209	– 0
2	104	– 1
2	52	– 0
2	26	– 0
2	13	– 0
2	6	– 1
2	3	– 0
	1	– 1

8/(a) Simplify the boolean expression, $(a+b)\cdot(\bar{b}+\bar{c})+b\cdot(\bar{a}+\bar{c})$ by using the laws of boolean algebra. From its truth table write it in minterm normal form.

$\Rightarrow (a+b)\cdot(\bar{b}+\bar{c}) + b\cdot(\bar{a}+\bar{c})$

$= a\bar{b} + ac + b\bar{b} + bc + b\bar{a} + b\bar{c}$

$= a\bar{b} + ac + bc + b\bar{a} + b\bar{c}$ $[\because A\bar{A} = 0]$

$= a\bar{b} + ac + b(c+\bar{c}) + b\bar{a}$

$= a\bar{b} + ac + b + b\bar{a}$ $[\because A + \bar{A} = 1]$

$= a\bar{b} + ac + b(1+\bar{a})$

$= a\bar{b} + ac + b$ $[\because 1 + \bar{A} = 1]$

a	b	c	$\bar{b}$	$a \cdot \bar{b}$	$a \cdot c$	$a\bar{b} + ac$	$Z = a\bar{b} + ac + b$
0	0	0	1	0	0	0	0
0	0	1	1	0	0	0	0
0	1	0	0	0	0	0	1
0	1	1	0	0	0	0	1
1	0	0	1	1	0	1	1
1	0	1	1	1	1	1	1
1	1	0	0	0	0	0	1
1	1	1	0	0	1	1	1