CS-131

Introduction to Information and Communication Technology

Section-K

211370113

BADAR RASHEED BUTT

"Assignment-4"

Submitted To:-

MAM SHAZMA NOOR

211370113

Q:2

A:-

8 letters are damaged.

B:-

1 letter is lost.

C:-

9 letters are delivered successfully.

D:-

$8/12 = 0.66$

0.66×100

Probability = 66%.

E:-

$4/12 = 0.33$

0.33×100

Probability = 33%.

F:-

$9/12 = 0.75$

0.75×100

Probability = 75%.

G:-

$3/12 = 0.25$

0.25×100

Probability = 25%.

H:-

$4/12 = 0.33$

0.33×100

Probability = 33%.

I:-

$5/12 = 0.42$

$= 0.42 \times 100$

Probability = 42%.

211370113

J:-

Word "Size" refers to the amount of data a CPU's internal data registers can hold and process at one time. Modern desktop computers have 64-bit words. Computers embedded in appliances and consumer products have word sizes of 8, 16 or 32 bits.

K:-

Ali asked:-

What does the word "size" means in terms of computer processing?

Q:3

Decimal to New Base

211370113

$(321.50)_{10}$

Binary:-

2 | 321
2 | 160 - 1
2 | 80 - 0
2 | 40 - 0
2 | 20 - 0
2 | 10 - 0
2 | 5 - 0
2 | 2 - 1
1 - 0

$.50 \times 2 = 1$

$(101000001.1)_2$

Octal:-

8 | 321
8 | 40 - 1
5 - 0

$.50 \times 8 = 4$

$(501.4)_8$

Hexadecimal:-

16 | 321
16 | 20 - 1
1 - 4

$.50 \times 16 = 8$

$(141.8)_{16}$

211370113

Q:4

Old base to Decimal

A. $(10100l.01)_2$

$= 1\times2^5 + 0\times2^4 + 1\times2^3 + 0\times2^2 + 0\times2^1 + 1\times2^0 + 0\times2^{-1} + 1\times2^{-2}$

$= 32 + 0 + 8 + 0 + 0 + 1 + 0.25$

$= (41.25)_{10}$

B. $(456.25)_8$

$= 4\times8^2 + 5\times8^1 + 6\times8^0 + 2\times8^{-1} + 5\times8^{-2}$

$= 256 + 40 + 6 + 0.25 + 0.078$

$= (302.328)_{10}$

C. $(C4B.50)_{16}$

$= 12\times16^2 + 4\times16^1 + 11\times16^0 + 5\times16^{-1} + 0\times16^{-2}$

$= 3072 + 64 + 11 + 0.3125 + 0$

$= (3147.3125)_{10}$

211370113

Q:5

Binary to new base:

A. $(10110.01)_2$

Octal:-

$= 1x2^4 + 0x2^3 + 1x2^2 + 1x2^1 + 0x2^0 + 0x2^{-1} + 1x2^{-2}$

$= 16 + 0 + 4 + 2 + 0 + 0 + 0.25$

$= (22.5)_{10}$

$8 \overline{)22}$

$2 - 6$

$.25 \times 8 = 2$

$(26.2)_8$

B. $(10110.01)_2$

Hexadecimal:-

$16 \overline{)22}$

$1 - 6$

$.25 \times 16 = 4$

$(16.4)_{16}$

21137011 3

C. $(10110.01)_2$

Octal:-

$8 \overline{)22}$
$2-6$

$.25 \times 8 = 2$

$(26.2)_8$

D. $(10010.01)_2$

Hexadecimal:-

$= 1x2^4 + 0x2^3 + 0x2^2 + 1x2^1 + 0x2^0 + 0x2^{-1} + 1x2^{-2}$

$= 16 + 0 + 0 + 2 + 0 + 0 + 0.25$

$= (18.25)_{10}$

$16 \overline{)18}$
$1-2$

$.25 \times 16 = 4$

$(12.4)_{16}$

211370113

Q:6

Old base to Binary:-

A. $(236.632)_8$

2 | 236
2 | 118 - 0
2 | 59 - 0
2 | 29 - 1
2 | 14 - 1
2 | 7 - 0
2 | 3 - 1
1 - 1

$(11101100.1010)_2$

$.632 \times 2 = 1.264 = 1$
$.264 \times 2 = 0.528 = 0$
$.528 \times 2 = 1.056 = 1$
$.056 \times 2 = 0.112 = 0$

211370113

B. $(C1B.E1D)_{16}$

2 | 12
2 | 6 - 0
2 | 3 - 0
1 - 1

2 | 11
2 | 5 - 1
2 | 2 - 1
1 - 0

2 | 14
2 | 7 - 0
2 | 3 - 1
1 - 1

2 | 13
2 | 6 - 1
2 | 3 - 0
1 - 1

$(110011011.111011101)_2$

C. $(30.03)_8$

2 | 30
2 | 15 - 0
2 | 7 - 1
2 | 3 - 1
1 - 1

$.03 \times 2 = 0.06 = 0$
$.06 \times 2 = 0.12 = 0$
$.12 \times 2 = 0.24 = 0$

$(11110.0000)_2$

D. $(D4B.4C)_{16}$

2 | 4
2 | 2 - 0
1 - 0

$(110101001011.01001100)_2$

21137011 3

Q:7

Octal to hexadecimal

A:- $(462.246)_8$

$= 4\times8^{2} + 6\times8^{1} + 2\times8^{0} + 2\times8^{-1} + 4\times8^{-2} + 6\times8^{-3}$

$= 256 + 48 + 2 + 0.25 + 0.0625 + 0.0117$

$= (306.3242)_{10}$

Hexadecimal:-

16 | 306

16 | 19 - 2

1 - 3

$.3242 \times 16 = 5.1872 = 5$

$.1872 \times 16 = 2.9952 = 2$

$.9952 \times 16 = 15.9232 = F$

$.9232 \times 16 = 14.7712 = E$

$(132.52FE)_{16}$

B. $(531.135)_8$

$= 5\times8^{2} + 3\times8^{1} + 1\times8^{0} + 1\times8^{-1} + 3\times8^{-2} + 5\times8^{-3}$

$= 320 + 24 + 1 + 0 + 0.125 + 0.047 + 0.0098$

$= (345.1818)_{10}$

211370113

Hexadecimal:-

16 | 345
16 | 21 - 9
1 - 5

$(159.2E8A)_{16}$

$.1818 \times 16 = 2.9088 = 2$
$.9088 \times 16 = 14.5408 = E$
$.5408 \times 16 = 8.6528 = 8$
$.6528 \times 16 = 10.4448 = A$

Q:8

Hexadecimal to Octal:

A. (A3B.1C)

$= 10 \times 16^2 + 3 \times 16^1 + 11 \times 16^0 + 1 \times 16^{-1} + 12 \times 16^{-2}$

$= 2560 + 48 + 11 + 0.0625 + 0.047$

$= (2619.1095)_{10}$

Octal:

8 | 2619
8 | 327 - 3
8 | 40 - 7
5 - 0

$.1095 \times 8 = 0.876 = 0$
$.876 \times 8 = 7.008 = 7$
$.008 \times 8 = 0.0064 = 0$
$.064 \times 8 = 0.512 = 0$

$(5073.0700)_8$

211370113

B. $(4C2.6F)_{16}$

$= 4\times16^{2} + 12\times16^{1} + 2\times16^{0} + 6\times16^{-1} + 15\times16^{-2}$

$= 1024 + 192 + 2 + 0.375 + 0.058$

$= (1218.433)_{10}$

Octal:-

$8 \mid 1218$

$8 \mid 152 - 2$

$8 \mid 19 - 0$

$2 - 3$

$.433\times8 = 3.464 = 3$

$.464\times8 = 3.712 = 3$

$.712\times8 = 5.696 = 5$

$.696\times8 = 5.568 = 5$

$(2302.3355)_{8}$

Q:9

2's Compliment:-

21137011 3

A. $(28)_8$

2	28
2	14 - 0
2	7 - 0
2	3 - 1
	1 - 1

$(28)_8 = (00011100)_2$

2's Compliment :-

$(11100100)_2$

$(28)_{10} = (00011100)_2$

2's Compliment :-

$(11100100)_2$

$(28)_{16} = (00011100)_2$

2's Compliment :-

$(11100100)_2$

211370113

Q:1o

A. 5o+4o

2 | 5o	
2 | 25-o	
2 | 12-1	
2 | 6-o	
2 | 3-o	
	1-1

2 | 4o	
2 | 2o-o	
2 | 1o-o	
2 | 5-o	
2 | 2-1	
	1-o

$$\begin{array}{r} 5o: \quad 0\ \overset{1}{0}\ 1\ 1\ 0\ 0\ 1\ 0 \\ 4o: +\ 0\ 0\ 1\ 0\ 1\ 0\ 0\ 0 \\ \hline (0\ 1\ 0\ 0\ 1\ 0\ 1\ 0)_2 \end{array}$$

B. 5o-4o

$$\begin{array}{r} 5o: \quad 0\ 0\ 1\ 1\ 0\ 0\ 1\ 0 \\ 4o: \quad \cancel{0\ 0\ 1\ 0\ 1\ 0\ 0\ 0} \\ 2\text{'s Compliment of 4o}: +\ 1\ 1\ 0\ 1\ 1\ 0\ 0\ 0 \\ \hline (\cancel{1}\ 0\ 0\ 0\ 0\ 1\ 0\ 1\ 0)_2 \end{array}$$

211370113

C. 33+18

2 | 33	
2 | 16 - 1	
2 | 8 - 0	
2 | 4 - 0	
2 | 2 - 0	
1 - 0	

2 | 18	
2 | 9 - 0	
2 | 4 - 1	
2 | 2 - 0	
1 - 0	

33: 0 0 1 0 0 0 0 1

18: + 0 0 0 1 0 0 1 0

$(0\ 0\ 1\ 1\ 0\ 0\ 1\ 1)_2$

D. 18-33

18: 0 0 0 1 1 0 0 1 0

33: 0 0 1 0 0 0 0 1

2's compliment of 33: + 1 1 0 1 1 1 1 1

$(1\ 1\ 1\ 1\ 0\ 0\ 0\ 1)_2$