BRAC UNIVERSITY
Inspiring Excellence

CSE260: Digital Logic Design
Summer 2025
Quiz - 01
Duration: 20 minutes

A

Name: Solution	ID:	Section:

1.CO1	Multiply $(1BE)_{16}$ by $(13)_8$. **Must show your workings and answer in base-8.**	5
2.CO1	Add $(42)_{10}$ and $-(85)_{10}$ in 10 bits using 1's complement number system. Justify whether there is an overflow or not.	5
3.CO1	Suppose you are organizing a charity event with $(1D5)_{16}$ other students. Each person, including yourself, donates $(13)_6$ taka. Then you used the money to spend $(42143)_5$ on food. How much money was left after paying all the expenses? **Show your answer in decimal.**	5

1) $(1BE)_{16}$ = 000110111110
= $(0676)_8$

$8\overline{)16}$ → 2, rem 0 ; $8\overline{)23}$ → 2, rem 7
$8\overline{)20}$ → 2, rem 4 ; $8\overline{)13}$ → 1, rem 5
$8\overline{)12}$ → 1, rem 4 ; $8\overline{)9}$ → 1, rem 1

$$\begin{array}{r} 676 \\ \times\ 13 \\ \hline 2472 \\ 676\times \\ \hline 11452 \end{array}$$

Ans: $(11452)_8$

2)

42	85
21 0	42 1
10 1	21 0
5 0	10 1
2 1	5 0
1 0	2 1
0 1	1 0
	0 1

$(42)_{10} = (101010)_2$

+42 in 10-bits = $(0000101010)_{1S}$

$(85)_{10} = (1010101)_2$

+85 = $(0001010101)_{1S}$ in 10-bits

−85 = $(1110101010)_{1S}$

$$\begin{array}{r} {}^{1}\quad {}^{1}\quad {}^{1} \\ 0000\,1\,0\,1\,0\,10 \\ +\,1\,1\,1\,0\,1\,0\,1\,0\,10 \\ \hline (1111\,0\,1\,0\,1\,0\,0)_{15} \end{array}$$

Result → $(1111010100)_{15}$

No overflow, since we are adding two different signed numbers.

3) $(1D5)_{16} = 1\times16^2 + 13\times16^1 + 5\times16^0 = (469)_{10}$

Total students = $469+1 = 470$

Each person contributes = $(13)_6 = 1\times6^1 + 3\times6^0 = (9)_{10}$

Total money = $470 \times 9 = (4230)_{10}$

Food = $(42143)_5 = 4\times5^4 + 2\times5^3 + 1\times5^2 + 4\times5^1 + 3\times5^0$

$= (2798)_{10}$

Total money left = $4230 - 2798$

$= (1432)_{10}$ taka