BRAC UNIVERSITY

Inspiring Excellence

CSE260: Digital Logic Design

Summer 2025

Quiz - 01

Duration: 20 minutes

B

Name: Solution	ID:	Section:

1.CO1	Multiply $(542)_8$ by $(1B)_{16}$. **Must show your workings answer in base-16.**	5
2.CO1	Add $(37)_{10}$ and $-(63)_{10}$ 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 $(2A)_{16}$ other students. Each person, including yourself, donates $(40)_5$ taka. Then you used the money to spend $(458)_9$ on food. How much money was left after paying all the expenses? **Show your answer in decimal.**	5

1) $(542)_8 = (001\,011\,000\,010)_2 = (162)_{16}$

$$\begin{array}{r} 162 \\ \times\ 1B \\ \hline 1F36 \\ 162\times \\ \hline 2556 \end{array}$$

$16 \overline{)22}$, -16, 6

$16 \overline{)67}$, -64, 3

$16 \overline{)21}$, -16, 5

Answer $= (2556)_{16}$

2)

2	37	
2	18	1
2	9	0
2	4	1
2	2	0
2	1	0
	0	1

2	63	
2	31	1
2	15	1
2	7	1
2	3	1
2	1	1
	0	1

$(63)_{10} = (111111)_2$

$(+63)_{10}$ in 10-bits $= (0000111111)_{1S}$

$(-63)_{10} = (1111000000)_{1S}$

$(37)_{10} = (100101)_2$

$(+37)_{10}$ in 10-bits $= (0000100101)_{1S}$

$$
\begin{array}{r}
0000100101 \\
+\ 1111000000 \\
\hline
(1111100101)_{15}
\end{array}
$$

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

3) $(2A)_{16} = 2\times16^1 + 10\times16^0 = (42)_{10}$

Total students = $42+1 = 43$

Each person contributes = $(40)_5 = 4\times5^1 + 0\times5^0 = (20)_{10}$

Total money = $43 \times 20 = (860)_{10}$

Food = $(458)_9 = 4\times9^2 + 5\times9^1 + 8\times9^0$

$= (377)_{10}$

Total money left = $860 - 377$

$= (483)_{10}$ taka