

1.(24 pts)

Character	Hollerith	EBCDIC binary	EBCDIC hex	ASCII binary	ASCII hex	ASCII Decimal
C	12-3	1100 0011	C3	0100 0011	43	67
K	11-2	1011 0010	B2	0100 1011	4B	51
T	0-3	0000 0011	03	0101 0011	53	83
7	7	1111 0111	F7	0011 0111	37	55

A=41
 B=42
 C=43
 D=44
 E=45
 F=46
 G=47
 H=48
 I=49
 J=4A
 K=4B
 Q=50
 T=53

2.(16 pts) Perform the below conversions from decimal to the appropriate base

Decimal	8-bit binary	hex	Base 5	Base 7
17	00010001	11	32	23
39	0010 0111	27	74	54
69	0100 0101	45	234	126
102	0110 0110	66	402	204
127	0111 1111	7F	502	241

3.(16) Perform the below additions in the appropriate bases. You may assume that you can include the "carry-out".

$$\begin{array}{r}
 \begin{array}{ccccccc}
 \text{\tiny 1} & \text{\tiny 1} & \text{\tiny 1} & \text{\tiny 1} & \text{\tiny 1} & \text{\tiny 1} & \text{\tiny 1} \\
 1 & 0 & 0 & 1 & 1 & 0 & 1 & 1_2 \\
 + & 0 & 1 & 1 & 0 & 1 & 1 & 1_2 \\
 \hline
 1 & 0 & 0 & 0 & 0 & 1 & 0 & 1_2
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{cccc}
 \text{\tiny 1} & \text{\tiny 1} & \text{\tiny 1} & \text{\tiny 1} \\
 3 & 0 & 4 & 4_5 \\
 + & 2 & 4 & 3 & 3_5 \\
 \hline
 1 & 1 & 0 & 3 & 3_5
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{ccc}
 \text{\tiny 1} & \text{\tiny 1} & \text{\tiny 1} \\
 3 & 5 & 6_7 \\
 + & 4 & 5 & 3_7 \\
 \hline
 1 & 1 & 4 & 3_7
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{ccc}
 \text{\tiny 1} & \text{\tiny 1} & \text{\tiny 1} \\
 2 & C & 3 & A_{16} \\
 + & F & E & 2 & 8 & D_{16} \\
 \hline
 1 & 2 & A & 6 & 3_8
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{ccccccc}
 \text{\tiny 1} & \text{\tiny 0} & \text{\tiny 0} & \text{\tiny 0} & \text{\tiny 0} & \text{\tiny 0} & \text{\tiny 0} \\
 1 & 0 & 0 & 1 & 1 & 0 & 1 & 1_2 \\
 - & 0 & 1 & 1 & 0 & 1 & 1 & 1_2 \\
 \hline
 0 & 0 & 1 & 0 & 1 & 1 & 0 & 0_2
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{cccc}
 \text{\tiny 2} & \text{\tiny 1} & \text{\tiny 0} & \text{\tiny 3} & \text{\tiny 1} & \text{\tiny 2} \\
 3 & 0 & 4 & 4_5 \\
 - & 2 & 4 & 3 & 3_5 \\
 \hline
 1 & 1 & 0 & 3_5
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{ccc}
 \text{\tiny 5} & \text{\tiny 1} & \text{\tiny 4} \\
 3 & 5 & 6_7 \\
 - & 2 & 5 & 3_7 \\
 \hline
 1 & 0 & 2 & 5_7
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{cccc}
 \text{\tiny C} & \text{\tiny 1} & \text{\tiny 0} & \text{\tiny 9} & \text{\tiny 1} & \text{\tiny 0} \\
 2 & C & 3 & A_{16} \\
 - & A & E & 2 & 8 & D_{16} \\
 \hline
 2 & E & 1 & E_8
 \end{array}
 \end{array}$$