J2. Computer Number Template (Complete this one)

Computer Number System Conversions

Activity	Download/Link	Deadline
JOURNAL	Journal 2: Template Journal 2: Accuracy Quiz	**Tues 26th** Oct 5pm
QUIZ *(100%)*	Quiz 2: Computer Numbers	**Friday 22nd Oct 5pm**

$Denary_{10}$	$Binary_2$	$Octal_8$	$Hexadecimal_{16}$
0	0000	0	0
1	0001	1	1
2	0010	2	2
3	0011	3	3
4	0100	4	4
5	0101	5	5
6	0110	6	6
7	0111	7	7
8	1000	10	8
9	1001	11	9
10	1010	12	A
11	1011	13	B
12	1100	14	C
13	1101	15	D
14	1110	16	E
15	1111	17	F
16	10000	20	10

Things to Note.

Conversion Table (Given in Exam)

$Denary/Decimal_{10}$ *Base: 10*	uses 1,0 symbols, maximum # is 9
$Binary_2$ *Base: 2*	uses 1,0 symbols, maximum # is 1
$Octal_8$ *Base: 8*	uses 8 symbols, maximum # is 7
$Hexadecimal_{16}$ *Base: 16*	uses 16 symbols, maximum # is 9, then letters A-F

Example

$Denary_{10}$	$Binary_2$	$Octal_8$	$Hexadecimal_{16}$
27	11011	33	1B

Convert TO Denary

Convert the following numbers to denary numbers showing calculations

Q1. Quiz Questions

(a) Give the decimal (denary) equivalent of binary number 1000001

Solution Show Steps

```
(2^6*1)+(2^5*0)+(2^4*0)+(2^3*0)+(2^2*0)+(2^1*0)+(2^0*1)
(2^6*1) + (2^0*1)
64+1
65
```

(b) Give the denary equivalent of octal number 47

Solution Show Steps

47
(4*8^1)+(7*8^)
(4*8)+(7*1)
32+7
39

Q2. Long Questions

Summer 2015

EXAM

(a) Give the denary equivalent of binary number 1011100110.1101

Solution Show Steps

(1*2^9)+(1*2^7)+(1*2^6)+(1*2^5)+(1*2^2)+(1*2^1).(1*2^-1)+(1*2^-2)+(1*2^-4)
512+128+64+32+4+2. 0.5+0.25+0.0625
742.8125

EXAM

(b) Give the denary equivalent of octal number 67432.54

Solution Show Steps

(6*8^4)+(7*8^3)+(4*8^2)+(3*8^1)+(2*8^0). (5*8^-1)+(4*8^-2)
24576+353584+256+24+2. 0.625+0.0625
28442.6875

Convert FROM Denary

Convert the following denary numbers to the base indicated, showing calculations

Q3. Quiz Questions

(a) Convert denary number **228** to binary

Solution Show Steps

Base Division	Remainder Fraction	Remainder
228/2		**0**
114/2		**0**
57/2	**0.5*2**	**1**
28/2		**0**
14/2		**0**
7/2	**0.5*2**	**1**
3/2	**0.5*2**	**1**
1/2		**1**

228 = 11100100

(b) Convert denary number **765** to octal

Solution Show Steps

Base Division	Remainder Fraction	Remainder
765/8	**0.625*8**	**5**
95/8	**0.875*8**	**7**
11/8	**0.375*8**	**3**
1/8		**1**

765 = 1375

(c) Convert denary number **763292** to hexadecimal

Solution Show Steps

Base Division	Remainder Fraction	Remainder
763292/16	**0.75*16**	**12 - C**
47705/16	**0.5625*16**	**9**
2891/16	**0.3125*16**	**5**
186/16	**0.625*16**	**10 - A**
11/16		**11 - B**

763292 = BA59C

Q4. Long Questions

Summer 2015

(a) Convert denary number **158.1875** to binary

Base Division	Remainder Fraction	Remainder
158/2		**0**
79/2	**39.5**	**1**
39/2	**19.5**	**1**
19/2	**9.5**	**1**
9/2	**4.5**	**1**
4/2		**0**
2/2		**0**
1/2		**1**
.		
*0.1875*2*	**0.375**	**0**
*0.375*2*	**0.75**	**0**
*0.75*2*	**1.5**	**1**
*0.5*2*	**1**	**1**

10011110.0011

(b) Convert denary number **7675.96875** to octal

Solution Show Steps

Base Division	Remainder Fraction	Remainder
7675/8	**0.375*8**	**3**
959/8	**0.875*8**	**7**
119/8	**0.875*8**	**7**
14/8	**0.75*8**	**6**
1/8		**1**
.		
*0.96875*8*	**7.75**	**7**
*0.75*8*	**6**	**6**

16773.76

Convert between Binary, Octal and Hexadecimal

Denary$_{10}$	Binary$_{2}$	Octal$_{8}$	Hexadecimal$_{16}$
0	0000	0	0
1	0001	1	1
2	0010	2	2
3	0011	3	3
4	0100	4	4
5	0101	5	5
6	0110	6	6
7	0111	7	7
8	1000	10	8
9	1001	11	9
10	1010	12	A
11	1011	13	B
12	1100	14	C
13	1101	15	D
14	1110	16	E
15	1111	17	F
16	10000	20	10

Things to Note.

Conversion Table (Given in Exam)

Denary/Decimal$_{10}$ *Base: 10*	uses 1,0 symbols, maximum # is 9
Binary$_{2}$ *Base: 2*	uses 1,0 symbols, maximum # is 1
Octal$_{8}$ *Base: 8*	uses 8 symbols, maximum # is 7
Hexadecimal$_{16}$ *Base: 16*	uses 16 symbols, maximum # is 9, then letters A-F

Example

Denary$_{10}$	Binary$_{2}$	Octal$_{8}$	Hexadecimal$_{16}$
27	11011	33	1B

Convert the following number systems

Q5. Quiz Questions

(a) Convert **binary** number **1010001** to **hexadecimal**

Solution Show Steps

0101 = 5
0001 = 1
10100001=51

(b) Convert **hexadecimal 4A** to **binary**

Solution Show Steps

4 A
4=0100
A = 1010
4A = 01001010

Q6. Long Questions

Summer 2015	(a) **1011101111001000011** from **binary** to **hexadecimal** *Solution Show Steps* **0101=5** **1101=D** **1110=E** **0100=4** **0011=3** 1011101111001000011=5DE43
	(b) **1A9C2F** from **hexadecimal** to **binary.** *Solution Show Steps* **1=0001** **A=1010** **9=1001** **C=1100** **2=0010** **F=1111** **1A9C2F=** **000110101001110000101111**