EXAM #3 prob 4 solution

Ex:

a) Express the product of the following octal numbers in binary:

34 (octal)
* 22 (octal)
= [ ] (binary)

b) Express the following number in Binary Coded Decimal (BCD):

6B (hexadecimal)

c) Express the decimal number 75 in binary.

sol'n: a) 34 octal = 3(8) + 4(1) = 28
22 octal = 2(8) + 2(1) = 18

28 (18) = 504 decimal

Now convert to binary:

$2\overline{)504}$		$2\overline{)3}$	r 1
$2\overline{)252}$	r 0	$2\overline{)1}$	r 1
$2\overline{)126}$	r 0	$2\overline{)0}$	r 1
$2\overline{)63}$	r 0		
$2\overline{)31}$	r 1		
$2\overline{)15}$	r 1		
$2\overline{)7}$	r 1		

Answer: 111 111 000 binary

or multiply in octal:

```
  34
  22
 ---
  70
 700
 ---
 770 octal
```

= 111 111 000 binary

b) 6B hexadecimal = 6(16) + B(1)

= 96 + 11 = 107 decimal

We translate each decimal digit into 4 bits of binary:

0001 0000 0111 BCD

c) We repeatedly divide by 2 and list remainders to get our binary equivalent of 75 decimal.

$2\overline{)75}$

$2\overline{)37}$ r1

$2\overline{)18}$ r1

$2\overline{)9}$ r0

$2\overline{)4}$ r1

$2\overline{)2}$ r0

$2\overline{)1}$ r0

0 r1

Answer: 1001011 binary

Check 64 + 0 + 0 + 8 + 0 + 2 + 1 = 75 ✓