① а) г.р. — 2002

$X = 2002$ (10 сс)

$X = 1 \cdot 2^{10} + 1 \cdot 2^9 + 1 \cdot 2^8 + 1 \cdot 2^7 + 1 \cdot 2^6 + 1 \cdot 2^4 + 1 \cdot 2^1 = 11111010010$ (2сс)

$\dfrac{X}{2} = 1 \cdot 2^9 + 1 \cdot 2^8 + 1 \cdot 2^7 + 1 \cdot 2^6 + 1 \cdot 2^5 + 1 \cdot 2^3 + 1 \cdot 2^0 = 1111101001$ (2сс)

~~11111010010~~
~~1111101001~~
~~10111011011~~

$\oplus$
```
 11111010010
  1111101001
 -----------
 10000111011
```

Код Грея — 10000111011

б) $10000111011 \to X_2$
    0 1 2 3 4 5 6 7 8 9 10

```
0:  1  = 1
1:  1  1 + 0 = 1
2:  1  1 + 0 + 0 = 1
3:  1  1 + 0 + 0 + 0 = 1
4:  1  1 + 0 + 0 + 0 + 0 = 1
5:  0  1 + 0 + 0 + 0 + 0 + 1 = 0
6:  1  1 + 0 + 0 + 0 + 0 + 1 + 1 = 1
7:  0  1 + 0 + 0 + 0 + 0 + 1 + 1 + 1 = 0
8:  0  1 + 0 + 0 + 0 + 0 + 1 + 1 + 1 + 0 = 0
9:  1  1 + 0 + 0 + 0 + 0 + 1 + 1 + 1 + 0 + 1 = 1
10: 0  1 + 0 + 0 + 0 + 0 + 1 + 1 + 1 + 0 + 1 + 1 = 0
```

$X_2 = 11111010010_2 = 2002_{10}$

② а) кол-во стр. — 327

$X = 327_{10} = 101000111_2$

$\dfrac{X}{2} = $ ~~101~~ $10100011_2$

$\oplus$
```
 101000111
  10100011
 ---------
 111100100
```

Код Грея — 111100100

б) $111100100 \rightarrow X_2$

$\phantom{}$ 012345678

0: 1   1=1
1: 0   1+1=0
2: 1   1+1+1=1
3: 0   1+1+1+1=0
4: 0   1+1+1+1+0=0
5: 0   1+1+1+1+0+0=0
6: 1   1+1+1+1+0+0+1=1
7: 1   1+1+1+1+0+0+1+0=1
8: 1   1+1+1+1+0+0+1+0+0=1

$X_2 = 101000111_2 = 327_{10}$

③ а) день – 18, месяц – 10

$X_{10} = 18 + 10 = 28_{10} = 11100_2$

$\dfrac{X}{2} = 1110_2$

$\oplus \begin{array}{r} 11100 \\ 1110 \\ \hline 10010 \end{array}$

Код Грея – 10010

б) $10010 \rightarrow X_2$

$\phantom{}$ 01234

0: 1   1=1
1: 1   1+0=1
2: 1   1+0+0=1
3: 0   1+0+0+1=0
4: 0   1+0+0+1+0=0

$X_2 = 11100 = 28_{10}$

④ а) $X = 15_{10} = 1111_2$

$$\frac{X}{2} = 111_2$$

$$\oplus \begin{array}{r} 1111 \\ 111 \\ \hline 1000 \end{array}$$

Код Грея — 1000

б) $\underset{0\ \ 1\ \ 2\ \ 3}{1\ 0\ 0\ 0} \rightarrow X_2$

0: 1 1 = 1
1: 1 1+0 = 1
2: 1 1+0+0 = 1
3: 1 1+0+0+0 = 1

$X_2 = 1111_2 = 15_{10}$