

Matematică, barem, clasa VI

Barem de corectare și notare

Subiectul I.

- a) cel mai mic număr: 110.....5p
 cel mai mare număr: 991.....5p
- b) Cum a,b,c cifre și $a \neq 0 \Rightarrow b \neq 0 \Rightarrow b \in \{1,2,...,9\}$1p
 $b = 1$ și $1 = 1^n, \forall n \in \mathbb{N} \Rightarrow a = 1, c \in \{0,1,...,9\} \Rightarrow 10$ numere1p
 $b \in \{2,3,5,6,7\} \Rightarrow a = b, c = 1 \Rightarrow 5$ numere1p
 $b = 4 \Rightarrow a = 4, c = 1$ sau $a = 2, c = 2 \Rightarrow 2$ numere.....2p
 $b = 8 \Rightarrow a = 8, c = 1$ sau $a = 2, c = 3 \Rightarrow 2$ numere.....2p
 $b = 9 \Rightarrow a = 9, c = 1$ sau $a = 3, c = 2 \Rightarrow 2$ numere2p
 In total, 21 numere.....1p

Subiectul II

- $a = 3$8p
 $b = 1009^2$8p
 $1009 = 202 \cdot 4 + 1 \Rightarrow U(3^{1009}) = 3$2p
 $U(a^b) = U(3^{1009^2}) = U((U(3^{1009}))^{1009}) = U(3^{1009}) = 3$2p

Subiectul III

- $\overline{abc} = 150 \cdot c + r, r < 150$5p
 $150 \cdot c < 999 \Rightarrow c \leq 6$, c-pătrat perfect $c \in \{0,1,4\}$1p
 $r < 150$, r-cub perfect $\Rightarrow r \in \{0,1,8,27,64,125\}$1p
 $c = 0 \Rightarrow \overline{abc} \in \{125\}$1p

$$c = 1 \Rightarrow \overline{abc} \in \{150, 151, 158, 177, 214, 275\} \dots\dots\dots 6p$$

$$c = 4 \Rightarrow \overline{abc} \in \{600, 601, 608, 627, 664, 725\} \dots\dots\dots 6p$$

Subiectul IV

$$2^a < 56, a - \text{prim} \Rightarrow a \in \{2, 3, 5\} \dots\dots\dots 3p$$

$$a = 2 \Rightarrow 3b + 2c + 6d = 52 \Rightarrow$$

$$\Rightarrow \left. \begin{array}{l} a = 2 \Rightarrow 3b + 2c + 6d = 52 \\ 2c : 2, 6d : 2, 52 : 2 \end{array} \right\} \Rightarrow 3b : 2, (3, 2) = 1, b - \text{prim} \Rightarrow b = 2 \dots\dots\dots 3p$$

$$\Rightarrow 2c + 6d = 46 \Rightarrow c + 3d = 23 \Rightarrow c = 2, d = 7 \text{ sau } c = 17, d = 2 \dots\dots\dots 3p$$

$$a = 3 \Rightarrow$$

$$\Rightarrow \left. \begin{array}{l} 3b + 2c + 6d = 48 \\ a = 3 \Rightarrow 3b + 2c + 6d = 48 \\ 3b : 3, 6d : 3, 48 : 3 \end{array} \right\} \Rightarrow 2c : 3, (2, 3) = 1, c = \text{prim} \Rightarrow c = 3 \dots\dots\dots 3p$$

$$\Rightarrow 3b + 6d = 42 \Rightarrow b + 2d = 14 \Rightarrow b : 2, b - \text{prim} \Rightarrow b = 2 \Rightarrow d = 6 \text{ "nu convine"} \dots\dots\dots 2p$$

$$a = 5 \Rightarrow$$

$$\Rightarrow \left. \begin{array}{l} 3b + 2c + 6d = 24 \\ \Rightarrow 3b + 2c + 6d = 24 \\ 2c : 2, 6d : 2, 24 : 2 \end{array} \right\} \Rightarrow 3b : 2, (3, 2) = 1, b - \text{prim} \Rightarrow b = 2 \dots\dots\dots 3p$$

$$\Rightarrow 2c + 6d = 18 \Rightarrow c + 3d = 9 \Rightarrow c = 3, d = 2 \dots\dots\dots 3p$$

Subiectul V

$$\text{Din } b) \Rightarrow \{3, 4\} \subseteq A \dots\dots\dots 3p$$

$$\text{și } \{3, 4\} \subseteq B \dots\dots\dots 3p$$

$$\text{Din } c) \Rightarrow \{1, 5, 6, 7\} \subset A \dots\dots\dots 4p$$

$$\text{Din } b), c), d) \Rightarrow 2 \in B, 2 \notin A \dots\dots\dots 4p$$

$$\text{Deci } A = \{1, 3, 4, 5, 6, 7\}, \dots\dots\dots 3p$$

$$B = \{2, 3, 4\} \dots\dots\dots 3p$$