1- $(1 + 2x)^6$

$\binom{6}{K} 1^{6-k} \cdot (2x^2)^K \Rightarrow \binom{6}{k} 2^k \cdot x^{2k}$

$2K = 8$
$K = 4$

$\binom{6}{4} 2^4 \cdot x^8 \Rightarrow \dfrac{6!}{4! \, 2!} \cdot 16 \cdot x^8 = 240x^8$

LETRA (C)

2 -

$(14x - 13y)^{237} \Rightarrow (14 - 13)^{237} \Rightarrow (1)^{237} = 1$

LETRA (B)

3 -

$\binom{11}{6} x^5 \cdot a^6 = 1386$

$\Rightarrow \dfrac{11!}{6! \, (11-6)!} = \dfrac{11 \cdot 10 \cdot 9 \cdot 8 \cdot 7}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1} = \dfrac{55440}{120} = 462$

$a^6 \cdot 462 = 1386 x^5$

$a^6 = \dfrac{1386 x^5}{462 x^5} \Rightarrow a^6 = 3 \Rightarrow a = \sqrt[6]{3}$

LETRA (A)

4 -

$$\left(x + \frac{1}{x^2}\right)^9 \Rightarrow T_{x+1} = \binom{9}{K} x^{9-K} \cdot \left(\frac{1}{x^2}\right)^K$$

$$T_{K+1} = \binom{9}{K} x^{9-K} \cdot \left(x^{-2}\right)^K$$

$$T_{K+1} = \binom{9}{k} \cdot x^{9-3K}$$

$$\binom{9}{K} \Rightarrow \binom{9}{3} \quad // \qquad\qquad 9 - 3K = 0$$
$$9 = 3K$$
$$K = \frac{9}{3} = 3 \; //$$

LETRA (D)

5 - $\left(x + \frac{1}{x^2}\right)^m \Rightarrow \left(x + 1 \cdot x^{-2}\right)^m$

$$\binom{m}{K} x^{m-K} \cdot \left(1 x^{-2}\right)^K \Rightarrow \binom{m}{K} x^{m-K} \cdot x^{-2K}$$

$$m - K + (-2K) = 0$$
$$m = K + 2K$$
LETRA (C) $\qquad\qquad m = 3K$
se 'n' desivível por 3 $\qquad \boxed{\frac{m}{3} = K} \; //$

$6 - K = \left(3x^3 + \dfrac{2}{x^2}\right)^5 - \left(243x^{15} + 810x^{10} + 1080x^5 - \dfrac{240}{x^5} + \dfrac{32}{x^{10}}\right)$

$\left(3x^3 + \dfrac{2}{x^2}\right)^5 = \binom{5}{0} \cdot (3x^5)^5 + \binom{5}{1}(3x^3)^4 \cdot \left(\dfrac{2}{x^2}\right) +$

$\binom{5}{2} \cdot (3x^3)^3 \cdot \left(\dfrac{2}{x^2}\right)^2 + \binom{5}{3} \cdot (3x^3)^2 \cdot \left(\dfrac{2}{x^2}\right)^3 +$

$\binom{5}{4} \cdot (3x^3) \cdot \left(\dfrac{2}{x^2}\right)^4 + \binom{5}{5} \cdot \left(\dfrac{2}{x^2}\right)^5$

$= 243x^{15} + 810x^{10} + 1080x^5 + \dfrac{240}{x^5} + \dfrac{32}{x^{10}}$

$K = \left(3x^3 + \dfrac{2}{x^2}\right)^5 - \left(243x^{15} + 810x^{10} + 1080x^5 + \dfrac{240}{x^5} + \dfrac{32}{x^{10}}\right) = 720 \; //$

LETRA (E)

7 - soma dos coeficientes de $(2x + 1y)^5$

$(2+1)^5 = 3^5 = 243 \; //$

LETRA (C)