1-) $(1+2x^2)^6$ $\quad T_{k+1} = \binom{m}{k} x^{m-k} a^k$

$$\binom{6}{k} 1^{6-k} \cdot (2x^2)^k = \_\, x^8$$

$2k = 8$

$k = 4$

$$\binom{6}{4} 1^2 \cdot (2x^2)^4 = x^8$$

$$\frac{6.5.4.3}{4.3.2.1} \cdot 1^2 \cdot 16x^8 = x^8$$

$$15 \cdot 1^2 \cdot 16x^8 = x^8$$

$$240x^8 = \underline{240}\, x^8$$

C

2-) $(14x - 13y)^{237}$

$(14.1 - 13.1)^{237} = 1^{237} = 1$

B

3-) $(x+a)^{11}$

$$\binom{11}{k} x^{11-k} a^k = 1386x^5$$

$11 - k = 5$

$k = 6$

A

$$\frac{11\,10\,9\,8\,7\,6}{6\,5\,4\,3\,2\,1} x^5 a^6 = 1386x^5$$

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

$a^6 = 3$

$a = \sqrt[6]{3}$

4-) $\left(x + \frac{1}{x^2}\right)^9$ $\quad \binom{9}{3} x^6 + (x^{-6})$

$$\binom{9}{k} x^{9-k} + (x^{-2})^k = x^0$$

D

$9 - k - 2k = 0$

$-3k = -9$

$k = 3$

5-) $\left(x + \frac{1}{x^2}\right)^n = (x + x^{-2})^n$

$\binom{n}{K} x^{n-K} + (x^{-2})^K$ C

$n - K - 2K = 0$

$-3K + n = 0$

$3K = n \rightarrow K = \frac{n}{3}$

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

$1(3x^3)^5(2x^{-2})^0 + 5(3x^3)^4(2x^{-2})^1 + 10(3x^3)^3(2x^{-2})^2 + 10(3x^3)^2(2x^{-2})^3 + 5(3x^3)^1(2x^{-2})^4 + 1(3x^3)^0(2x^{-2})^5$

$243x^{15} + 5.81x^{12}(2x^{-2}) + 10.27x^9(4x^{-4}) + 10.9x^6(8x^{-6}) + 5.3x^3(16x^{-8}) + 32x^{-10}$

$\cancel{243x^{15}} + \cancel{810x^{10}} + \cancel{1080x^5} + \underline{\underline{720}} + \cancel{240x^{-5}} + \cancel{32x^{-10}}$

E

7-) $(2x + y)^5$

$(2.1 + 1.1)^5 = 3^5 = 243$

C