MATRIX MATH

Total Marks: 30

<u>Topic: Binomial Expansion</u>

1 (i) Find, in ascending powers of x, the first four terms in the expansion $(1-3x)^7$. [2]

(ii) Hence, obtain the coefficient of x^2 in the expansion of $\left(2x + 3 - \dfrac{7}{5x}\right)(1-3x)^7$. [2]

2 (i) Write down the first three terms in the expansion, in ascending powers of x, of $(1+2x)^6$. [2]

(ii) If $(3-x)(1+2x)^6 = 3 + ax + \dfrac{1}{2}bx^2 + \ldots$, find the values of a and b. [3]

3 (i) Find the first 3 terms in the expansion, in ascending powers of x, of $(2-3x)^7$. [2]

(ii) Hence, estimate the value of $(1.997)^7$, leaving your answer to 2 decimal places. [2]

4 Find the term independent of x in the binomial expansion of $\left(2x^2 - \dfrac{1}{x}\right)^{12}$. [4]

5 Find the coefficient of x^4 in the expansion of $\left(4x^3 - \dfrac{3}{x^2}\right)^5$. [4]

6 The term independent of x in the binomial expansion of $\left(x^3 + \dfrac{a}{x^2}\right)^{10}$ is 210. Find the values of a. [4]

7   The coefficients of x and x^2 in the binomial expansion of $\left(3+2x\right)^n$ are equal.

    (i)   Find the value of n.   [3]

    (ii)   Hence find the coefficient of x^2 in the expansion of $\left(2x-\dfrac{1}{x}\right)\left(3+2x\right)^n$ [2]

Answer Key

1(i)	$1-21x+189x^2-945x^3+\ldots$
1(ii)	1848
2(i)	$1+12x+60x^2+\ldots$
2(ii)	$a=35,\ b=336$
3(i)	$128-1344x+6048x^2+\ldots$
3(ii)	126.66
4	7920
5	-4320
6	$1,-1$
7	$r=3.6$, term independent of x does not exist