Binomial Expansion

Question Paper 4

Level	International A Level
Subject	Maths
Exam Board	CIE
Topic	Series
Sub Topic	Binomial Expansion
Booklet	Question Paper 4

Time Allowed: **71 minutes**

Score: **/59**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

1 **(i)** Find the first 3 terms in the expansion of $(2-x)^6$ in ascending powers of x. [3]

(ii) Given that the coefficient of x^2 in the expansion of $(1+2x+ax^2)(2-x)^6$ is 48, find the value of the constant a. [3]

2 **(i)** Find, in terms of the non-zero constant k, the first 4 terms in the expansion of $(k+x)^8$ in ascending powers of x. [3]

(ii) Given that the coefficients of x^2 and x^3 in this expansion are equal, find the value of k. [2]

3 **(i)** Find the first 3 terms in the expansion of $(2+3x)^5$ in ascending powers of x. [3]

(ii) Hence find the value of the constant a for which there is no term in x^2 in the expansion of $(1+ax)(2+3x)^5$. [2]

4 Find the value of the coefficient of x^2 in the expansion of $\left(\frac{x}{2}+\frac{2}{x}\right)^6$. [3]

5 **(i)** Find the first 3 terms in the expansion, in ascending powers of x, of $(2+x^2)^5$. [3]

(ii) Hence find the coefficient of x^4 in the expansion of $(1+x^2)^2(2+x^2)^5$. [3]

6 **(i)** Find the first three terms in the expansion of $(2+u)^5$ in ascending powers of u. [3]

(ii) Use the substitution $u = x+x^2$ in your answer to part **(i)** to find the coefficient of x^2 in the expansion of $\left(2+x+x^2\right)^5$. [2]

7 Find the coefficient of x^2 in the expansion of $\left(x + \frac{2}{x}\right)^6$. [3]

8 The first three terms in the expansion of $(2 + ax)^n$, in ascending powers of x, are $32 - 40x + bx^2$. Find the values of the constants n, a and b. [5]

9 **(i)** Find the first 3 terms in the expansion of $(2 - x)^6$ in ascending powers of x. [3]

(ii) Find the value of k for which there is no term in x^2 in the expansion of $(1 + kx)(2 - x)^6$. [2]

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

11 Find the coefficient of x^3 in the expansion of

(i) $(1 + 2x)^6$, [3]

(ii) $(1 - 3x)(1 + 2x)^6$. [3]

12 Find the value of the coefficient of $\frac{1}{x}$ in the expansion of $\left(2x - \frac{1}{x}\right)^5$. [3]

13 Find the value of the term which is independent of x in the expansion of $\left(x + \frac{3}{x}\right)^4$. [3]