Binomial Expansion

Question Paper 2

Level	International A Level
Subject	Maths
Exam Board	CIE
Topic	Series
Sub Topic	Binomial Expansion
Booklet	Question Paper 2

Time Allowed: **63 minutes**

Score: **/52**

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 coefficient of x^8 in the expansion of $(x + 3x^2)^4$. [1]

(ii) Find the coefficient of x^8 in the expansion of $(x + 3x^2)^5$. [3]

(iii) Hence find the coefficient of x^8 in the expansion of $[1 + (x + 3x^2)]^5$. [4]

2 **(i)** In the expression $(1 - px)^6$, p is a non-zero constant. Find the first three terms when $(1 - px)^6$ is expanded in ascending powers of x. [2]

(ii) It is given that the coefficient of x^2 in the expansion of $(1 - x)(1 - px)^6$ is zero. Find the value of p. [3]

3 Find the coefficient of x^2 in the expansion of

(i) $\left(2x - \frac{1}{2x}\right)^6$, [2]

(ii) $(1 + x^2)\left(2x - \frac{1}{2x}\right)^6$. [3]

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

(ii) Given that the coefficient of x^2 in the expansion of $(1 + 2x)(2 + ax)^5$ is 240, find the possible values of a. [3]

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

(ii) Hence find the coefficient of x^8 in the expansion of $(2 + x)(2x - x^2)^6$. [2]

6 In the expansion of $\left(x^2 - \frac{a}{x}\right)^7$, the coefficient of x^5 is -280. Find the value of the constant a. [3]

7 Find the coefficient of x^3 in the expansion of $\left(2 - \frac{1}{2}x\right)^7$. [3]

8 Find the coefficient of x^6 in the expansion of $\left(2x^3 - \frac{1}{x^2}\right)^7$. [4]

9 The coefficient of x^3 in the expansion of $(a + x)^5 + (2 - x)^6$ is 90. Find the value of the positive constant a. [5]

10 Find the term independent of x in the expansion of $\left(2x + \frac{1}{x^2}\right)^6$. [3]

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

(ii) Use the result in part **(i)** to find the coefficient of x^2 in the expansion of $\left(2 - (2x - x^2)\right)^5$. [3]