Mock-1

Subject Code: 0606 **Exam Date: 12/11/2025**

Topics Included

CH 4 - Factor Theorem
CH 7 - Linear Law
CH 12 - Binomial Theorem

Instructions

- Answer all questions.
- Write your answer to each question in the space provided.
- Use a black or dark blue pen.
- Write your name, grade, division, and roll number in the space given.
- Do not use an erasable pen or correction fluid.

Student Details (must be filled)

Name	Roll No	Grade/Div
____________________	_________	_______/______

Marking (for teachers only)

Question 1	Question 2	Question 3	Question 4
_____/_____	_____/_____	_____/_____	_____/_____
Question 5	**Question 6**	**Question 7**	**Question 8**
_____/_____	_____/_____	_____/_____	_____/_____
Question 9	**Question 10**	**Question 11**	
_____/_____	_____/_____	_____/_____	

Total	Grade
_____/_____	_____

Signature	Date Completed
____________	____/____/_______

1 The first 3 terms in the expansion of $(a+x)^3\left(1-\frac{x}{3}\right)^5$, in ascending powers of x, can be written in the form $27+bx+cx^2$, where a, b and c are integers. Find the values of a, b and c. [8]

2

(a) Find the first three non-zero terms in the expansion of $\left(2-\frac{x^2}{4}\right)^6$ in ascending powers of x. Simplify each term. [3]

(b) Hence find the term independent of x in the expansion of $\left(2-\frac{x^2}{4}\right)^6\left(3-\frac{1}{x^2}\right)^2$. [3]

(a) Find the first three terms, in ascending powers of x^2, in the expansion of $\left(\frac{1}{2}-\frac{2}{3}x^2\right)^8$. Write your coefficients as rational numbers. [3]

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

4 The first three terms, in ascending powers of x, in the expansion of $(2+ax)^n$ can be written as $64+bx+cx^2$, where n, a, b and c are constants.

(a) Find the value of n. [1]

(b) Show that $5b^2 = 768c$. [4]

(c) Given that $b = 12$, find the exact value of a and of c. [2]

5 Variables x and y are such that, when $\lg(2y+1)$ is plotted against x^2, a straight line graph passing through the points (1, 1) and (2, 5) is obtained.

(a) Find y in terms of x. [4]

(b) Find the value of y when $x = \frac{\sqrt{3}}{2}$. [1]

(c) Find the value of x when $y = 2$. [2]

6 The first three terms, in ascending powers of x, in the expansion of $\left(1+\frac{x}{6}\right)^{12}(2-3x)^3$ can be written in the form $8+px+qx^2$, where p and q are constants. Find the values of p and q. [8]

7 The polynomial $p(x) = 6x^3 + ax^2 + 6x + b$, where a and b are integers, is divisible by $2x - 1$. When $p(x)$ is divided by $x - 2$, the remainder is 120.

(a) Find the values of a and b. [4]

(b) Hence write down the remainder when $p(x)$ is divided by x. [1]

(c) Find the value of $p''(0)$. [2]

8 The polynomial $p(x)$ is such that $p(x) = 6x^3 + ax^2 - 52x + b$, where a and b are integers. It is given that $p(x)$ is divisible by $2x - 3$ and that $p'(1) = 4$.

(a) Find the values of a and b. [5]

DO NOT USE A CALCULATOR IN THIS PART OF THE QUESTION.

(b) Using your values of a and b, factorise $p(x)$ fully. [3]

9 The first three terms, in ascending powers of x, in the expansion of $\left(1 - \frac{2x}{9}\right)^{18}(1+3x)^3$ are written in the form $1 + ax + bx^2$, where a and b are constants. Find the exact values of a and b. [7]

10 The first three terms, in descending powers of x, of the expansion of $\left(ax + \frac{2}{5}\right)^5\left(1 - \frac{b}{x}\right)^2$, can be written as $32x^5 - 160x^4 + cx^3$, where a, b and c are constants. Find the exact values of a, b and c. [9]

11 The first four terms in ascending powers of x in the expansion $(3 + ax)^4$ can be written as $81 + bx + cx^2 + \frac{3}{2}x^3$. Find the values of the constants a, b and c. [6]