CLASSIFIED

International Examinations Papers

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Pure Mathematics-1

TOPIC- Binomial-Coefficient

1. Find the coefficient of x in the expansion of $\left(3x - \dfrac{2}{x}\right)^5$. N-4-1 [4]

Find the coefficient of x in the expansion of $\left(\dfrac{1}{x} + 3x^2\right)^5$. J-16-13-1 [3]

02

03 Find the coefficient of x in the expansion of $\left(x^2 - \dfrac{2}{x}\right)^5$. J-14-13-1

04 Find the coefficient of x in the expansion of $\left(x + \dfrac{2}{x^2}\right)^7$. J-11-11-1 [3]

J-10-11-2

05 **(i)** Find the first 3 terms in the expansion of $\left(2x - \dfrac{3}{x}\right)^5$ in descending powers of x. [3]

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

0 6   Find the coefficient of x^2 in the expansion of $\left(x + \dfrac{2}{x}\right)^6$.   N-G- 4

07   Find the coefficient of x^2 in the expansion of $(1 + x^2)\left(\dfrac{x}{2} - \dfrac{4}{x}\right)^6$.   J-14-12-2   [5]

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

N −11−12−1

   (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]

09   **(i)** Find the first three terms, in ascending powers of **x**, in the expansion of

   (a) $(1 - x)^6$,   *J−15−11−3*   [2]

   (b) $(1 + 2x)^6$.   [2]

   (ii) Hence find the coefficient of x^2 in the expansion of $\left[(1 - x)(1 + 2x)\right]^6$.   [3]
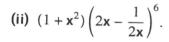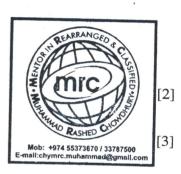
10 Find the value of the coefficient of x^2 in the expansion of $\left(\dfrac{x}{2} + \dfrac{2}{x}\right)^6$. N-8-1 [3]

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

J-13-12-2

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

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

1'2 Find the coefficient of x^3 in the expansion of $\left(2 - \frac{1}{2}x\right)^7$.   *N-12-13-1*   [3]

13   In the expansion of $(1 + ax)^6$, where a is a constant, the coefficient of x is -30. Find the coefficient of x^3.   *N-10-11-2*   [4]

14   **(i)** Find the coefficients of x^2 and x^3 in the expansion of $(2 - x)^6$.   *I-15-12-3*   [3]

     (ii) Find the coefficient of x^3 in the expansion of $(3x + 1)(2 - x)^6$.   [2]

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

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

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

$\mathcal{J}$– 4– 4

16   **(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 $(2 + x + x^2)^5$.   N-7-3   [2]

17   **(i)** Find the first 3 terms in the expansion, in ascending powers of x, of $(1 - 2x^2)^8$.   [2]

    (ii) Find the coefficient of x^4 in the expansion of $(2 - x^2)(1 - 2x^2)^8$. $N{-}10{-}12{-}1$ [2]

18   **(i)** Find the first three terms, in descending powers of x, in the expansion of $\left(x - \dfrac{2}{x}\right)^6$.   [3]

    (ii) Find the coefficient of x^4 in the expansion of $(1 + x^2)\left(x - \dfrac{2}{x}\right)^6$.   [2]

19

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

$\mathcal{J}\text{-}8\text{-}3$

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

2¹0 Find the coefficient of x^6 in the expansion of $\left(2x^3 - \dfrac{1}{x^2}\right)^7$.   J-12-11-2   [4]

21   **(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]

N-12-11-4

22   **(i)** Find the coefficient of x^8 in the expansion of $(x + 3x^2)^4$.   N-13-13-8   [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 $\left[1 + (x + 3x^2)\right]^5$.   [4]

2 3   Find the term independent of x in the expansion of $\left(2x + \dfrac{1}{x^2}\right)^6$.   N–4–11–1   [3]

2 4   Find the term independent of x in the expansion of $\left(2x + \dfrac{1}{2x^3}\right)^8$.   N–16–11–2   [4]
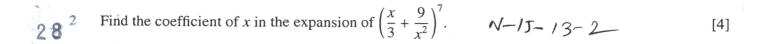
2 5   Find the term independent of x in the expansion of $\left(4x^3 + \dfrac{1}{2x}\right)^8$.   J–14–11–3   [4]

26 Find the term independent of x in the expansion of $\left(x - \dfrac{1}{x^2}\right)^9$. N— 10—13—1

27 Find the term independent of x in the expansion of $\left(x - \dfrac{3}{2x}\right)^6$. J—11—11 — 1 [3]

2 **8** **²** Find the coefficient of x in the expansion of $\left(\dfrac{x}{3} + \dfrac{9}{x^2}\right)^7$. N—15— 13- 2 [4]

2 **9** Find the term that is independent of x in the expansion of

J— 16—12— 4

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

(ii) $\left(2 + \dfrac{3}{x^2}\right)\left(x - \dfrac{2}{x}\right)^6$. [4]