MEGA LECTURE

Q1.

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

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

Q2.

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

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

Q3.

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

Q4.

1 The coefficient of x^3 in the expansion of $(a+x)^5+(1-2x)^6$, where a is positive, is 90. Find the value of a. [5]

Q5.

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

Q6.

3 The first three terms in the expansion of $(1-2x)^2(1+ax)^6$, in ascending powers of x, are $1-x+bx^2$. Find the values of the constants a and b. [6]

Q7.

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]

Q8.

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]

Q9.

3 (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]

Q10.

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

Q11.

1 Find the term independent of x in the expansion of $\left(x-\frac{1}{x^2}\right)^9$. [3]

Q12.

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

Q13.

1 The coefficient of x^2 in the expansion of $\left(k+\frac{1}{3}x\right)^5$ is 30. Find the value of the constant k. [3]

Q14.

4 (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]

Q15.

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

Q16.

1 **(i)** Find the first three terms when $(2+3x)^6$ is expanded in ascending powers of x. [3]

(ii) In the expansion of $(1+ax)(2+3x)^6$, the coefficient of x^2 is zero. Find the value of a. [2]

Q17.

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

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

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