**MATHEMATICS**

**DPP**

DAILY PRACTICE PROBLEMS

# DPP No. 59

**Total Marks : 52**

**Max. Time : 59 min.**

**Topic : Binomial Theorem**

| **Type of Questions** | | **M.M., Min.** |
|---|---|---|
| **Subjective Questions (no negative marking) Q.1,2,3,4,5,6,7** | **(4 marks, 5 min.)** | **[28, 35]** |
| **Single choice Objective (no negative marking) Q.8,9,10,11,12,13,14,15** | **(3 marks, 3 min.)** | **[24, 24]** |

**1.** Expand the following :

(i) $\left(\frac{2}{x}-\frac{x}{2}\right)^5$, $(x \neq 0)$ (ii) $\left(y^2+\frac{2}{y}\right)^4$, $(y \neq 0)$

**2.** Find the $7^{th}$ term from the end in the expansion of $\left(9x-\frac{1}{3\sqrt{x}}\right)^{18}$, $x \neq 0$.

**3.** In the binomial expansion of $\left(\sqrt[3]{2}+\frac{1}{\sqrt[3]{3}}\right)^n$, the ratio of the 7th term from the begining to the 7th term from the end is 1 : 6 ; find n.

**4.** Find the coefficient of

(i) $x^6y^3$ in $(x + y)^9$ (ii) $a^5 b^7$ in $(a - 2b)^{12}$

**5.** Find the terms independent of 'x' in the expansion of the expression, $(1 + x + 2x^3)\left(\frac{3}{2}x^2-\frac{1}{3x}\right)^9$.

**6.** Find the co-efficient of $x^7$ in $\left(ax^2+\frac{1}{bx}\right)^{11}$ and of $x^{-7}$ in $\left(ax-\frac{1}{bx^2}\right)^{11}$ and find the relation between 'a' & 'b' so that these co-efficients are equal. (where $a, b \neq 0$).

**7.** Find the positive value of 'a' so that the co–efficient of $x^5$ is equal to that of $x^{15}$ in the expansion of $\left(x^2+\frac{a}{x^3}\right)^{10}$.

**8.** The $(m + 1)^{th}$ term of $\left(\frac{x}{y}+\frac{y}{x}\right)^{2m+1}$ is:

(A) independent of x (B) a constant

(C) depends on the ratio x/y and m (D) none of these

**9.** The total number of distinct terms in the expansion of, $(x + a)^{100} + (x - a)^{100}$ after simplification is :

(A) 50 (B) 202 (C) 51 (D) none of these

**10.** The value of, $\frac{18^3+7^3+3.18.7.25}{3^6+6.243.2+15.81.4+20.27.8+15.9.16+6.3.32+64}$ is :

(A) 1 (B) 2 (C) 3 (D) none

**11.** If the 6th term in the expansion of $\left[\frac{1}{x^{8/3}}+x^2\log_{10}x\right]^8$ is 5600, then x =

(A) 10 (B) 8 (C) 11 (D) 9

**12.** In the expansion of $\left(3-\sqrt{\frac{17}{4}+3\sqrt{2}}\right)^{15}$, the 11th term is a:

(A) positive integer (B) positive irrational number
(C) negative integer (D) negative irrational number.

**13.** If the second term of the expansion $\left[a^{1/13}+\frac{a}{\sqrt{a^{-1}}}\right]^n$ is $14a^{5/2}$, then the value of $\frac{{}^nC_3}{{}^nC_2}$ is:

(A) 4 (B) 3 (C) 12 (D) 6

**14.** The co-efficient of x in the expansion of $(1-2x^3+3x^5)\left(1+\frac{1}{x}\right)^8$ is :

(A) 56 (B) 65 (C) 154 (D) 62

**15.** In the expansion of $(7^{1/3}+11^{1/9})^{6561}$, the number of terms free from radicals is:
(A) 730 (B) 729 (C) 725 (D) 750

# Answers Key

**1.** (i) $\left(\frac{2}{x}\right)^5-5\left(\frac{2}{x}\right)^3+10\left(\frac{2}{x}\right)-10\left(\frac{x}{2}\right)+5\left(\frac{x}{2}\right)^3-\left(\frac{x}{2}\right)^5$

(ii) $y^8+8y^5+24y^2+\frac{32}{y}+\frac{16}{y^4}$

**2.** ${}^{18}C_6$ **3.** n = 9 **4.** (i) ${}^9C_3$ (ii) $-2^7.{}^{12}C_7$

**5.** $\frac{17}{54}$ **6.** ${}^{11}C_5\frac{a^6}{b^5}$, ${}^{11}C_6\frac{a^5}{b^6}$, a b = 1 **7.** $\frac{1}{2\sqrt{3}}$

**8.** (C) **9.** (C) **10.** (A) **11.** (A)

**12.** (B) **13.** (A) **14.** (C) **15.** (A)