

Topic : Binomial Theorem

Type of Questions		M.M., Min.
Single choice Objective (no negative marking) Q.,5,6,7,8	(3 marks, 3 min.)	[12, 12]
Subjective Questions (no negative marking) Q. 1,2,3,4,9,10	(4 marks, 5 min.)	[24, 30]

- Find the co-efficient of x^6 in the expansion of $(1 - 2x)^{-5/2}$.
- Assuming 'x' to be so small that x^2 and higher powers of 'x' can be neglected, show that,

$$\frac{\left(1 + \frac{3}{4}x\right)^{-4} (16 - 3x)^{1/2}}{(8 + x)^{2/3}}$$
 is approximately equal to, $1 - \frac{305}{96}x$.
- Coefficient of x^7 in $(1 - 2x + x^3)^5$
- Find the coefficient of $a^5 b^4 c^7$ in the expansion of $(bc + ca + ab)^8$.
 - Sum of coefficients of odd powers of x in expansion of $(9x^2 + x - 8)^6$
- If $(1 + x)^{10} = a_0 + a_1x + a_2x^2 + \dots + a_{10}x^{10}$, then value of $(a_0 - a_2 + a_4 - a_6 + a_8 - a_{10})^2 + (a_1 - a_3 + a_5 - a_7 + a_9)^2$ is
 (A) 2^{10} (B) 2 (C) 2^{20} (D) None of these
- Sum of the infinite series $\frac{1}{2!} + \frac{1+2}{3!} + \frac{1+2+3}{4!} + \dots$ to ∞
 (A) $\frac{e}{3}$ (B) e (C) $\frac{e}{2}$ (D) none of these
- The coefficient of x^6 in series e^{2x} is
 (A) $\frac{4}{45}$ (B) $\frac{3}{45}$ (C) $\frac{2}{45}$ (D) None of these
- Find the sum of the series $\frac{1}{2} - \frac{1}{2 \times 2^2} + \frac{1}{3 \times 2^3} - \frac{1}{7 \times 2^4} + \dots$
 (A) $\log_e\left(\frac{3}{2}\right)$ (B) $\log_e\left(\frac{2}{3}\right)$ (C) $\log_e\left(\frac{4}{7}\right)$ (D) None of these
- Sum the series $1 + \frac{2^3}{1!} + \frac{3^3}{2!} + \frac{4^3}{3!} + \dots$
- If $y = \left(x - \frac{x^2}{2} + \frac{x^3}{2} - \frac{x^4}{2} + \dots \text{to } \infty\right)$ and $|x| < 1$, prove that $x = \left(y + \frac{y^2}{2!} + \frac{y^3}{3!} \dots \text{to } \infty\right)$.

Answers Key

1. $\frac{15015}{16}$ 3. 20 4. (i) 280(ii) 2^5 5. (A)
6. (C) 7. (A) 8. (A) 9. 15e