

Comprehensive Test Series-03
Binomial Theorem (8)& Conic Sections(11)

TIME: 2.00 hr.

MM: 80

General Instructions:

- All Questions are compulsory.
 - Marks are given alongwith the questions individually.
 - Use of calculator is not permitted.
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- Q.1 Evaluate $(101)^4$
- Q.2 Find $(x+1)^6 + (x-1)^6$. Hence or otherwise evaluate $(\sqrt{2}+1)^6 + (\sqrt{2}-1)^6$
- Q.3 Show that $9^{n+1} - 8n - 9$ is divisible by 64, whenever n is a positive integer.
- Q.4 Indicate which number is larger: $(1.2)^{4000}$ or 800
- Q.5 Find the middle term in the expansion of $\left(3 - \frac{x^3}{6}\right)^7$
- Q.6 The coefficients of the $(r-1)^{\text{th}}$, r^{th} and $(r+1)^{\text{th}}$ terms in the expansion of $(x+1)x^n$ are in the ratio 1:3:5. Find both n and r.
- Q.7 Prove that the coefficient of x^n in the expansion of $(1+x)^{2n}$ is twice the coefficient of x^n in the expansion $(1+x)^{2n-1}$.
- Q.8 Find the term independent of x in the expansion of $\left(x + \frac{1}{x}\right)^{12}$, where $x \neq 0$.
- Q.9 Find an approximation of (0.99) using the first three terms of its expansion.
- Q.10 Find n, if the ratio of the fifth term from the beginning to the fifth term from the end in the expansion $\left(\sqrt[4]{2} + \frac{1}{\sqrt[4]{3}}\right)^n$ is $\sqrt{6} : 1$.
- Q.11 If the coefficient of 5th, 6th and 7th terms in the expansion of $(1+x)^n$ are in A.P find n.
- Q.12 Find the equation of the circle passing through the points (4,1) and (6,5) and whose centre is on the line $4x + y = 16$
- Q.13 Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the latus rectum of the ellipse. $\frac{x^2}{25} + \frac{y^2}{9} = 1$
- Q.14 Find the coordinates of the foci, the vertices, the lengths of major and minor axes and the eccentricity of the ellipse $9x^2 + 4y^2 = 36$
- Q.15 Find the equation for the ellipse that satisfies given conditions Vertices $(\pm 5,0)$, foci $(\pm 4,0)$
- Q.16 Find the equation for the ellipse that satisfies given conditions Ends of major axis $(0, \pm \sqrt{5})$, ends of minor axis $(\pm 1,0)$
- Q.17 Find the equation for the ellipse that satisfies given conditions Centre at (0,0) major axis on the y-axis and passes through the points (3,2) and (1,6).
- Q.18 Find the equation of the hyperbola with foci $(0, \pm 3)$ and vertices $(0, \pm \frac{\sqrt{11}}{2})$
- Q.19 Find the equation of the hyperbola where foci are $(0, \pm 12)$ and the length of the latus rectum is 36.
- Q.20 Find the coordinates if the foci and the vertices, the eccentricity and the length of the latus rectum of the hyperbola $\frac{x^2}{16} - \frac{y^2}{9} = 1$