

Set – D

- (1) The eccentricity of the ellipse $9x^2 + 5y^2 - 30y = 0$ is _____
- (a) $\frac{1}{3}$ (b) $\frac{2}{3}$ (c) $\frac{3}{4}$ (d) None of these
- (2) If A is a square matrix such that $|A| = 2$, then for any positive integer n, $|A^n|$ is equal to _____
- (a) 0 (b) 2n (c) 2^n (d) n^2
- (3) Value of a for which $2\hat{i} - \hat{j} + \hat{k}$, $\hat{i} + 2\hat{j} - 3\hat{k}$ and $3\hat{i} + a\hat{j} + 5\hat{k}$ are coplanar is _____
- (a) 2 (b) 4 (c) -4 (d) 3
- (4) The direction cosines of the normal to the plane $6x - 3y - 2z = 1$ are _____
- (a) $\left(\frac{6}{7}, 3, \frac{-2}{7}\right)$, (b) $(6, -3, -2)$ (c) $\frac{1}{7}(6, -3, -2)$ (d) $\frac{1}{7}(6, 3, 2)$
- (5) If $p(n, 5) = 60 p(n-1, 3)$, then n is _____
- (a) 6 (b) 15 (c) 10 (d) 12
- (6) $\lim_{x \rightarrow 0} \frac{\sin x - x}{x^3}$ is _____
- (a) $\frac{1}{3}$ (b) $\frac{-1}{3}$ (c) $\frac{1}{6}$ (d) $\frac{-1}{6}$
- (7) If α, β are two different complex numbers such that $|\alpha| = 1$, $|\beta| = 1$, then the expression $\left| \frac{\beta - \alpha}{1 - \overline{\alpha}\beta} \right|$ equals
- (a) $\frac{1}{2}$ (b) 1 (c) 2 (d) None of these
- (8) If $\sin^{-1} x + \sin^{-1} y = \frac{2\pi}{3}$, then $\cos^{-1} x + \cos^{-1} y$ is equal to _____
- (a) $\frac{2\pi}{3}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{6}$ (d) π

- (9) Let x, y two variables and $x > 0, x y = 1$, then minimum value of $x + y$ is _____
- (a) 1 (b) 2 (c) $2\frac{1}{2}$ (d) $3\frac{1}{3}$
- (10) The number of ways in which 200 things can be divided into 100 sets, each of 2 things is _____
- (a) $\frac{(200)!}{2^{100}(100)!}$ (b) $\frac{(200)!}{2^{100}}$ (c) $\frac{(200)!}{(100)!}$ (d) $\frac{(200)!}{(100)!(100)!}$
- (11) The term independent of x in $\left(\frac{3x^2}{2} - \frac{1}{3x}\right)^9$ is _____
- (a) $\frac{7}{18}$ (b) $\frac{5}{18}$ (c) $\frac{11}{18}$ (d) $\frac{13}{18}$
- (12) Sets A and B have 3 and 6 elements respectively what can be the minimum number of elements in $A \cup B$?
- (a) 3 (b) 6 (c) 9 (d) 18
- (13) Set A has 3 elements and set B has 4 elements. The total number of injections (one one mappings) that can be defined from A to B is _____
- (a) 144 (b) 12 (c) 24 (d) none of these.
- (14) Area of the triangle formed by $(1, -4)$, $(3, -2)$ and $(-3, 16)$ is _____
- (a) 40 (b) 48 (c) 24 (d) none of these.
- (15) $\int \frac{(1 + \log x)^2}{x} dx$ is equal to _____
- (a) $1 + \log x$ (b) $3(1 + \log x)^3$ (c) $\frac{1}{3}(1 + \log x)^3$ (d) None of these
- (16) If the third term of an A-P is 12 and the seventh term is 24, then the 10th term is _____
- (a) 36 (b) 39 (c) 30 (d) 33
- (17) The lines $2x - 3y = 5$ and $3x - 4y = 7$ are the diameters of a circle of area 154 square units. Then the equation of the circle is _____

(a) $x^2 + y^2 + 2x - 2y = 62$ (b) $x^2 + y^2 + 2x - 2y = 47$

(c) $x^2 + y^2 - 2x + 2y = 47$ (d) $x^2 + y^2 - 2x + 2y = 62$

- (18) The sum of the digits in the unit place of all the numbers formed with the help of 3, 4, 5, 6 taken all at a time is _____

(a) 18 (b) 108 (c) 432 (d) 144

- (19) The coefficient of x^4 in $\left(\frac{x}{2} - \frac{3}{x^2}\right)^{10}$ is _____

(a) $\frac{405}{256}$ (b) $\frac{504}{259}$ (c) $\frac{450}{260}$ (d) None of these

- (20) A unit vector perpendicular to each of the vectors, $-6\hat{i} + 8\hat{k}$, $8\hat{i} + 6\hat{k}$ form a right handed system is _____

(a) $-\hat{j}$ (b) $\hat{j}$ (c) $\frac{1}{10}(6\hat{i} + 8\hat{k})$ (d) $\frac{1}{10}(-6\hat{i} + 8\hat{k})$