

**Set – E**

- (1) The latus vectum of the parabola  $x^2 - 4x - 2y - 8 = 0$  is \_\_\_\_\_  
(a) 8            (b) 4            (c) 2            (d) 1
- (2) For a  $3 \times 3$  matrix A, if  $\det A = 4$ , then  $|\text{Adj}A|$  equals \_\_\_\_\_  
(a)  $-4$             (b) 4            (c) 16            (d) 64
- (3) If two vectors  $\vec{a}$  and  $\vec{b}$  be such that  $|\vec{a} + \vec{b}| = |\vec{a} - \vec{b}|$ , then the angle between  $\vec{a}$  and  $\vec{b}$  is \_\_\_\_\_  
(a)  $60^\circ$             (b)  $180^\circ$             (c)  $90^\circ$             (d)  $0^\circ$
- (4) If  $\cos\alpha, \cos\beta, \cos\gamma$  are the direction cosines of a line, then the value of  $\sin^2\alpha + \sin^2\beta + \sin^2\gamma$  is \_\_\_\_\_  
(a) 1            (b) 2            (c) 3            (d) 4
- (5) The maximum number of points of intersection of 8 circles is \_\_\_\_\_  
(a) 16            (b) 24            (c) 28            (d) 56
- (6)  $\lim_{x \rightarrow 0} \frac{a^x - 1}{\sqrt{1+x} - 1}$  is equal to \_\_\_\_\_  
(a)  $2 \log_e a$     (b)  $\frac{1}{2} \log_e a$     (c)  $a \log_e 2$             (d) None of these
- (7) The smallest positive integer n for which  $\left(\frac{1+i}{1-i}\right)^n = -1$  is \_\_\_\_\_  
(a) 1            (b) 2            (c) 3            (d) 4
- (8) If  $\sin\left(\sin^{-1}\frac{1}{5} + \cos^{-1}x\right) = 1$ , then x is equal to \_\_\_\_\_  
(a) 1            (b) 0            (c)  $\frac{4}{5}$             (d)  $\frac{1}{5}$
- (9) The minimum value of the function  $y = 2x^3 - 21x^2 + 36x - 20$  is \_\_\_\_\_  
(a)  $-128$             (b)  $-126$             (c)  $-120$             (d) None of these

- (10) The number of different matrices that can be formed with elements 0, 1, 2, or 3 each having 4 elements is
- (a)  $3 \times 2^4$       (b)  $2 \times 4^4$       (c)  $3 \times 4^4$       (d)  $4^4$
- (11) The number of terms in the expansion of  $(2x + 3y - 4z)^n$  is \_\_\_\_\_
- (a)  $n + 1$       (b)  $n + 3$       (c)  $\frac{(n+1)(n+2)}{2}$       (d) None of these
- (12) Let  $n(u) = 700$ ,  $n(A) = 200$ ,  $n(B) = 300$  and  $n(A^c \cap B^c) =$  \_\_\_\_\_
- (a) 400      (b) 600      (c) 300      (d) 200
- (13) Let  $E = \{1, 2, 3, 4\}$  and  $F = \{1, 2\}$  then the number of onto functions from E to F is \_\_\_\_\_
- (a) 14      (b) 16      (c) 12      (d) 8
- (14) The image of the point  $(4, -13)$  in the line  $5x + y + 6 = 0$  is \_\_\_\_\_
- (a)  $(-1, -14)$       (b)  $(3, 4)$       (c)  $(1, 2)$       (d)  $(-4, 13)$
- (15)  $\int \sec^3 x \, dx$  is equal to \_\_\_\_\_
- (a)  $\frac{1}{2} \tan x \sec x$       (b)  $\frac{1}{2} \log |\sec x + \tan x|$
- (b)  $\frac{1}{2} \sec x \tan x + \frac{1}{2} \log |\sec x + \tan x|$       (d) None of these.
- (16) The number of ways in which four left terms of the word MATHEMATICS can be arranged is given by \_\_\_\_\_
- (a) 136      (b) 192      (c) 1680      (d) 2454
- (17) The line  $3x - 4y = \lambda$  touches the circle  $x^2 + y^2 - 4x - 8y - 5 = 0$  if the value of  $\lambda$  is
- (a) 20      (b) 15      (c) 10      (d) 5
- (18)  $\int_0^\pi \sin^2\left(\frac{x}{2}\right) dx$  equals \_\_\_\_\_
- (a)  $\frac{16}{15}$       (b)  $\frac{32}{15}$       (c)  $\frac{8}{15}$       (d)  $\frac{5}{6}$

(19) The value of  $\lambda$  for which the equation  $x^2 - \lambda xy + 2y^2 + 3x - 5y + 2 = 0$  may represent a pair of straight lines is \_\_\_\_\_

- (a) 2                      (b) 3                      (c) 4                      (d) 1

(20) If the sum of two unit vectors is a unit vector, then the magnitude of their difference is \_\_\_\_\_

- (a)  $\sqrt{2}$                       (b)  $\sqrt{3}$                       (c) 2                      (d)  $\sqrt{5}$