**Miscellaneous Questions**

**Type – 1**

**Choose the correct options. One or more potions may be correct.**

Q 1. If in a ABC, = 0 then

(a) ABC is equilateral (b) a3 + b3 + c3 = 3abc (c) ∑ sin A = 0 (d) ∑ sin3 A – 3Π sin A = 0

Q 2. α, β are the roots of x2 – px + q = 0 and α, β, γ are the roots of x3 – ax2 + bx − c = 0. Then

(a) pq + c = aq (b) p + γ = a (c) pγ + q = b (d) γq = c

Q 3. Let  where and  are unit vectors such that . Then

(a)  (b)  (c)  (d) 

Q 4. ABC is an isosceles triangle whose vertices A and C have the coordinates (1,1) and (2, –1) respectively, and AC is one of the two equal sides. If the equation of the side AB is x + y = 2 then B has the coordinates

(a) (4, –2) (b) (2, 0) (c)  (d) 

Q 5. A vertical, rectangular, thin wall of length = a metres, height = b metres runs from east to west. A vertical flagstaff of height h metres stands on the top edge of the wall, dividing the wall in the ratio p:q(p > q). A man starts walking towards the east from the eastern end of the wall. After walking a distance x metres he can just see the top of the flagstaff. Instead, if he walks a distance x metres towards the west from the western end then he can see two-thirds of the flagstaff. Then

(a)  (b)  (c) p = 2q (d) p = 3q

Q 6. Which of the following is/are equal to (?

(a)  (b)  (c)  (d) 

Q 7. For the vectors and  which of the following is/are meaningful if and x represent scalar and vector products respectively?

(a)  (b)  (c)  (d) 

Q 8. If a, b, c are three consecutive integers then the determinant

is divisible by

(a) 36 (b) 144 (c) 48 (d) none of these

Q 9. Let P, A, B, C be four collinear points in order, the distances of A, B, C from P being a, b, c respectively. If the equation

(b - a)x2 +(a - c)x + c - b = 0 has one root double the other then

(a) B divides AC in the ratio 2 :1 internally

(b) C divides AB in the ratio 2 :1 externally

(c) B divides AC in the ratio 1: 2 internally

(d) none of these

Q 10. If x2 + px + q is an integer for all integral values of x then

(a) p is an integer (b) q is an integer (C) is an integer (d) is an integer

Q 11. The equation px3 - (p + 1)x2 +px = 0 has real roots and p is any positive integer. Then the equation has

(a) exactly one root less than 1 (b) more than one root < 1

(c) all roots greater than 1 (d) none of these

Q 12. If 4x2 + x + 12k2 ≥ 47 for all x ∈ R then λ can have the value

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

Q 13. Let f(x) = 5a2 + 4(x - 1) - x2, x ∈ R and a is a real constant. If the maximum value of fix) is 20 then a is

(a) -2 (b) 4 (c) 2 (d) none of these

Q 14. If A = is equal tois equal to

(a) A - B + 2 (b) A - 2B (c) A + 1 (d) A + B

Q 15. The equation of a parabola is x + y = 0. The line x = 1, after getting reflected from the parabola, passes

(a) along the line 3x + 4y + 1 = 0 (b) through the point (-1, 1)

(c) through the point (d) through the point

Q 16. If fix) = {x - [x]} I cos πx I where [•] is the greatest integer function then f(x) is

(a) an even function (b) an odd function (c) a periodic function (d) a many-one function

Q 17. Let fix) be a continuous even periodic function of period a and f(0) = 0. Then

(a) fix) is monotone in (b) for all x

(c) f(x) is differentiable in (d) f(x) has a maximum value

Q 18. If in a ΔABC, a = , c = 3 and A = 30° then the angle B has the measure

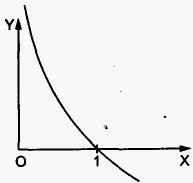
(a) 90° (b) 60° (c) 30° (d) 120°

Q 19. There are n + 1 identical balls on which the numbers nC0,nC1,nC2,..., nCn are written, each ball carrying a different number. The total number of ways in which the balls can be arranged in a row so that the values of numbers on the first and the last are equal, is

(a) n! when n is even (b) (n2 -1). (n - 2)! when n is odd

(c) .n ! when n is even (d) (n + 1) . (n - 1)! when n is odd

Q 20. The figure given below can be the rough sketch of the function given by



(a) y = log2 x (b) x.2y = 1 (c) x = log0.5 y (d) y = log0.5 x

Q 21. If px + qx + r = 0 has no real roots for real values of p, q, r and 4p + 2q + r > 0 then

(a) r > 0 (b) p + q + r > 0 (c) p + q + r < 0 (d) r > 0

Q 22. If f(x) = 3x 2 + 12x -1, x e [-1,2]

37 - x, x ∈ (2, 3] then

(a) f(x) is monotonic increasing in [-1,2] (b) f(x) is continuous in [-1,3]

(c) f(x) has the maximum value at x = 2 (d) f’ (2) does not exist

Q 23. P and Q are two points on the curve x2 + y2 = a2, where ∠POQ= O being the origin. The equation of the tangent to the curve at P is x - y + 2a = 0. The equation of the tangent to the curve at Q is

(a) x + 3y - 2a = 0 (b) x + y - 2a = 0 (c) x + 2y - 2a = 0 (d) x + y + 2a = 0

**Answers**

1abc 2abcd 3acd 4ac 5ad 6abc 7ab 8abc 9ac 10ab

11ab 12bc 13ac 14acd 15acd 16cd 17bd 18ac 19ab 20bd

21ab 22abcd 23bd