

December 2023

BSC (Animations) Re-Appear 1st Sem., December 2023

Mathematics (BSC-AM-19-103)

Time: 3 Hours

Max. Marks:75

- Instructions:**
1. It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.
 2. Answer any four questions from Part -B in detail.
 3. Different sub-parts of a question are to be attempted adjacent to each other.

PART -A

- Q1 (a) Write General Form of a Line (1.5)
- (b) Write Slope Intercept Form of a Line (1.5)
- (c) Write Point-Slope Form (1.5)
- (d) The slope of a Line Using Coordinates (1.5)
- (e) The slope of a Line Using General Equation (1.5)
- (f) Intercept-Intercept Form (1.5)
- (g) Distance Formula (1.5)
- (h) Area of a Triangle Formula (1.5)
- (i) Find the unit vector in the direction of the sum of the vectors (1.5)
- (j) Find the vector joining the points P(2, 3, 0) and Q(- 1, - 2, - 4) directed from P to Q. (1.5)

PART -B

- Q2 (a) The centre of a circle is $(2a, a - 7)$. Find the values of a , if the circle passes through the point $(11, -9)$ and has a diameter $10\sqrt{2}$ units. (7.5)
- (b) Find the ratio in which the line $2x + 3y - 5 = 0$ divides the line segment joining the points $(8, -9)$ and $(2, 1)$. Also, find the coordinates of the point of division. (7.5)
- Q3 (a) In what ratio does the point $(24/11, y)$ divide the line segment joining the points $P(2, -2)$ and $Q(3, 7)$? Also, find the value of y . (7.5)
- (b) If the distances of $P(x, y)$ from $A(5, 1)$ and $B(-1, 5)$ are equal, then prove that $3x = 2y$. (7.5)
- Q4 Find the area of a triangle whose vertices are given as $(1, -1)$, $(-4, 6)$ and $(-3, -5)$. (15)
- Q5 (a) Find a relation between x and y if the points $A(x, y)$, $B(-4, 6)$ and $C(-2, 3)$ are collinear. (7.5)
- (b) If the points $A(1, -2)$, $B(2, 3)$, $C(a, 2)$ and $D(-4, -3)$ form a parallelogram, find the value of a and height of the parallelogram taking AB as the base. (7.5)

Q6 (a) Find the area of a rhombus if its vertices are $(3, 0)$, $(4, 5)$, $(-1, 4)$ and $(-2, -1)$ (7.5)
taken in order. [Hint: Area of a rhombus = $1/2$ (product of its diagonals)]

(b) Find the point on the x-axis, which is equidistant from $(2, -5)$ and $(-2, 9)$. (7.5)

Q7 Show that the points $(1, 7)$, $(4, 2)$, $(-1, -1)$ and $(-4, 4)$ are the vertices of a (15)
square.
