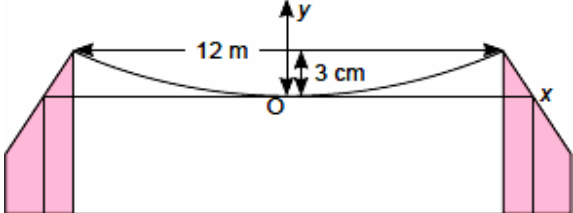
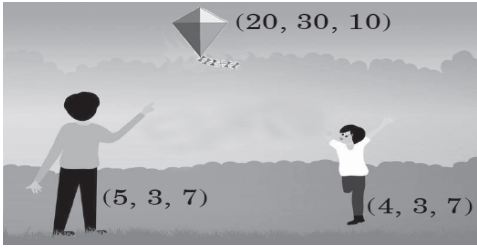


## CBT CLASS XI MATHS JANUARY-2025

**GENERAL INSTRUCTION :**

**CHAPTER: CONIC SECTIONS AND INTRODUCTION TO 3-D GEOMETRY**

Sr.No	Question	Marks
	<p><b>Case Study 1</b></p> <p>1. A beam is supported at its ends by supports which are 12 m apart. Since the load is concentrated at its centre, there is a deflection of 3 cm at the centre and deflected beam is in the shape of parabola. Now considering the centre of beam is at origin as shown in figure. Answer the following:</p> 	
1	<p>The equation of the parabola is _____?</p> <p>(a) <math>x^2 = 4ay</math>            (b) <math>x^2 = -4ay</math>            (c) <math>x^2 = ay</math>            (d) <math>x^2 = -ay</math></p>	1
2	<p>The focus of the parabola is _____?</p> <p>(a) (300,0)            (b) (30,0)            (c) (0,300)            (d) (0,30)</p>	1
3	<p>The length of the latus rectum of the parabola is ____?</p> <p>(a) 120m            (b) 1200m            (c) 12m            (d) 12000m</p>	1
4	<p>How far from the centre is the deflection 1cm?</p> <p>(a) <math>-2\sqrt{6}</math>            (b) <math>2\sqrt{6}</math>            (c) <math>\sqrt{6}</math>            (d) None of these</p>	1
	<p><b>Case Study 2</b></p> <p>Raj and his father were walking in a large park. They saw a kite flying in the sky. The position of kite, Raj and Raj's father are at (20, 30, 10), (4, 3, 7) and (5, 3, 7) respectively. On the basis of above information, answer the following:</p> 	
5	<p>Find the distance between Raj and kite</p> <p>(a) <math>\sqrt{963}</math></p>	1

	(b) $\sqrt{994}$ (c) 1 (d) NONE OF THESE	
6	Find the distance between Raj and his father (a) $\sqrt{963}$ (b) $\sqrt{994}$ (c) 1 (d) NONE OF THESE	1
7	Find the distance between kite and father (a) $\sqrt{963}$ (b) $\sqrt{994}$ (c) 1 (d) NONE OF THESE	1
8	If co-ordinates of kite, Raj and Raj's father form a triangle, then find the centroid of it (a) ( 29/3, 12,8) (b) ( 12,29/3, 8) (c) ( 8, 12, 29/3) (d) None of these	1
	<b>Directions: ( Q.9 – Q.10) Each of these questions contains two statements: Assertion (A) and Reason (R). Each of these questions also has four alternative choices, any one of which is the correct answer . You have to select one of the options (a) , (b) , (c) and (d) given below :</b> (a) A is true , R is true and R is a correct explanation for A (b) A is true , R is true and R is not a correct explanation for Assertion (c) A is true and R is false (d) A is false and R is true	
9	<b>Assertion(A):</b> The equation of a circle of radius 5 which touches the x-axis at origin at origin is $x^2 + y^2 \pm 10y = 0$ <b>Reason(R):</b> The circle which touches the x-axis at origin has its centre on y-axis. (a) (b) (c) (d)	1
10	<b>Assertion (A):</b> The points A(1, -1, 3), B(2, -4, 5) and C(5, -13, 11) are collinear. <b>Reason (R):</b> If $AB + BC = AC$ , then A, B, C are collinear. (a) (b) (c) (d)	1

#### Answer Key

<b>Ans1</b>	<b>(a)</b>
<b>Feedback</b>	Since it is upward parabola so Equation of parabola is $x^2 = 4ay$ ,so correct option is (a)
<b>Ans2</b>	<b>(c)</b>
<b>Feedback</b>	Point(6,3/100) lies on parabola Therefore $36 = 4 \times a \times 3/100$ $a = 300$ Focus =(0,300),so correct option is (C)
<b>Ans3</b>	<b>(b)</b>
<b>Feedback</b>	Length of latus rectum= $4a=4 \times 300=1200$ m,so correct option is (b)
<b>Ans4</b>	<b>(b)</b>
<b>Feedback</b>	

	<p>Where the deflection is 1cm. Let the coordinates of point be <math>(k, 2/100)</math></p> $x^2 = 4ay \Rightarrow k^2 = 4 \times 300 \times \frac{2}{100}$ $\Rightarrow k^2 = 24 \Rightarrow k = 2\sqrt{6}$ <p><math>\therefore</math> At distance of <math>2\sqrt{6}</math> m from centre deflection is 1 cm. so correct option is (b).</p>
<b>Ans5</b>	(b)
<b>Feedback</b>	Using distance formula $= \sqrt{[(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2]}$ the required distance is $= \sqrt{994}$ so correct option is (b).
<b>Ans6</b>	(c)
<b>Feedback</b>	Using distance formula $= \sqrt{[(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2]}$ the required distance is = 1 so correct option is (c).
<b>Ans7</b>	(a)
<b>Feedback</b>	Using distance formula $= \sqrt{[(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2]}$ the required distance is $= \sqrt{963}$ so correct option is (a).
<b>Ans8</b>	(a)
<b>Feedback</b>	Using formula for centroid $= (29/3, 12, 8)$ so correct option is (a).
<b>Ans9</b>	(a)
<b>Feedback</b>	The circle touches the x-axis at origin has its centre on y-axis. so R is true, A is its correct explanation.
<b>Ans10</b>	(a)
<b>Feedback</b>	A is correct since sum of distance between two points is equal to third distance, and (R) is its correct explanation. so option (a) is correct.