DELHI PUBLIC SCHOOL, JAMMU

ASSIGNMENT CYCLE TEST II

(2019-20)

Sub: Mathematics **Class: XI**

Q1. The acute angle between the medians drawn from the acute angles of a right angled isosceles triangle is

a. $\cos^{-1}\left(\frac{2}{3}\right)$ **b.** $\cos^{-1}\left(\frac{3}{4}\right)$ **c.** $\cos^{-1}\left(\frac{4}{5}\right)$ **d.** $\cos^{-1}\left(\frac{5}{6}\right)$

Q2. The distance between the orthocenter and circumcentre of the triangle with vertices (1, 2).(2, 1) and $\left(\frac{3+\sqrt{3}}{2}, \frac{3+\sqrt{3}}{2}\right)$ **is**

a. 0 **b.** $\sqrt{2}$ **c.** $3 + \sqrt{3}$ **d. none of these**

Q3. The equation of the straight line which passes through the point (-4, 3) such that the portion of the line between the axes is divided internally by the point in the ratio 5 : 3 is

a. 9x – 20y + 96 = 0 **b. 9x + 20y = 24**

c. 20x + 9y + 53 = 0 **d. none of these**

Q4. The equation of the parabola whose vertex is (a, 0) and the directrix has the equation x + y = 3a, is

a. $x^2 + y^2 + 2xy + 6ax + 10ay + 7a^2 = 0$ **b.** $x^2 - 2xy + y^2 + 6ax + 10ay - 7a^2 = 0$

c. $x^2 - 2xy + y^2 - 6ax + 10ay - 7a^2 = 0$ **d. none of these**

Q5. The parametric equations of a parabola are $x = t^2 + 1$, $y = 2t + 1$. **The Cartesian equation of its directrix is**

a. x = 0 **b. x + 1 = 0** **c. y = 0** **d. none of these**

Q6. The equation of the conic with focus at (1, -1) directrix along x – y + 1 = 0 and eccentricity $\sqrt{2}$ **is**

a. xy = 1 **b. 2xy + 4x – 4y – 1 = 0**

c. $x^2 – y^2 = 1$ **d. 2xy – 4x + 4y + 1 = 0**

Q7. The eccentricity of the conic $9x^2 – 16y^2 = 144$ **is**

a. $\frac{5}{4}$ **b.** $\frac{4}{3}$ **c.** $\frac{4}{5}$ **d.** $\sqrt{7}$

Q8. For ellipse $x^2 + 4y^2 = 9$

a. the eccentricity is 1/2 **b. the latus-rectum is 3/2**

c. a focus is $(3\sqrt{3}, 0)$ **d. directrix is $x = -2\sqrt{3}$**

Q9. If the latus-rectum of an ellipse is one half of its minor axis, then its eccentricity is

a. $\frac{1}{2}$ **b.** $\frac{1}{\sqrt{2}}$ **c.** $\frac{\sqrt{3}}{2}$ **d.** $\frac{\sqrt{3}}{4}$

Q10. If the major axis of an ellipse is three times the minor axis, then its eccentricity is equal to

a. $\frac{1}{3}$ **b.** $\frac{1}{\sqrt{3}}$ **c.** $\frac{1}{\sqrt{2}}$ **d.** $\frac{2\sqrt{2}}{3}$ **e.** $\frac{2}{3\sqrt{2}}$

Q11. Find the equation of the parabola whose:

(i) Focus is (3, 0) and the directrix is 3x + 4y = 1

(ii) Focus is (1, 1) and the directrix is x + y + 1 = 0

(iii) focus is (0,0) and the directrix 2x – y – 1 = 0

Q12. Find the equation of the parabola whose focus is the point (2, 3) and directrix is the line x – 4y + 3 = 0. Also find the length of its latus-rectum.

Q13. Find the equation of the parabola if

(i) the focus is at (-6, -6) and the vertex is at (-2, 2)

(ii) the focus is at (0, -3) and the vertex is at (0, 0)

(iii) the focus is at (0, - 3) and the vertex is at (-1, -3)

(iv) the focus is at (a, 0) and the vertex is at (a', 0)

Q14. Find the equation of the straight line passing through the point (6, 2) and having slope – 3.

Q15. Find the equation of the straight line which divides the join of the points (2, 3) and (-5, 8) in the ratio 3 : 4 and is also perpendicular to it.

Q16. Prove that the perpendicular drawn from the point (4, 1) on the join of (2, -1) and (6, 5) divides it in the ratio 5 : 8.

Q17. Find the equations to the altitudes of the triangle whose angular points and A(2, -2), B(1, 1) and C(-1, 0).

Q18. **Find the equation of the right bisector of the line segment joining the points (3, 4) and (-1, 2).**

Q19. **Find the equation of the line passing through the point (-3, 5) and perpendicular to the joining (2, 5) and (-3, 6).**

Q20. **Using section formula, show that the points A(2, -3, 4), B(-1, 2, 1) and C$\left(0, \frac{1}{3}, 2\right)$ are collinear.**

Q21. **Find the lengths of the medians of the triangle with vertices A(0, 0, 6), B(0, 4, 0) and (6, 0, 0).**

Q22. **If the origin is the centroid of the triangle PQR with vertices P(2a, 2, 6), Q(-4, 3b, -10) and R(8, 14, 2c), then find the values of a, b and c.**

Q23. **Find the coordinates of a point on y-axis which are at a distance of $5\sqrt{2}$ from the point P (3, -2, 5).**

Q24. **Find the sum to n terms of the sequence, 8, 88, 888, 8888……**

Q25. **Find four numbers forming a geometric progression in which the third term is greater than the first term by 9, and the second term is greater than the 4^{th} by 18.**