

KVDT Chennai - 36
HOLIDAY HOMEWORK - WINTER BREAK

XI - MATHEMATICS SECTION - B

Q. NO. 5 to 12 are of 2 marks each.

5. How many terms of the A.P. $-6, -\frac{11}{2}, -5, \dots$ are needed to give the sum -25 ?
6. If a, b, c, d are in G.P., Show that $(a^2 + b^2 + c^2) \times (b^2 + c^2 + d^2) = (ab + bc + cd)^2$
7. Find the distance between Parallel lines $15x + 8y - 34 = 0$ & $15x + 8y + 31 = 0$
8. Find the equation of the right bisector of the line joining the points $(3, 4)$ & $(-1, 2)$
9. Find the Co-ordinates of focus, vertex, equation of the directrix and the length of the latus-rectum of the parabola $x^2 = -16y$
10. Find the equation of the ellipse, whose length of minor axis is 16, & foci at $(0, \pm 6)$.
11. Using section formula, show that $A(2, -3, 4)$, $B(-1, 2, 1)$ and $(0, \frac{1}{3}, 2)$ are collinear.

- 12. Find the image; i) $P(-3, 3, 4)$ in the yz Plane
 ii) $(-5, 9, 3)$ in the xz -Plane
 iii) Find the distance of the point $A(-4, 3, 5)$ from co-ordinate axes.

SECTION - C

Q. NO. 13 to 23 are of 4 marks each.

- 13. If S_1, S_2, S_3 are the sum of first n natural numbers, their squares and their cubes respectively, Show that $9S_2^2 = (S_3) \times (1 + 8S_1)$
- 14. If a and b are the roots of $x^2 - 3x + p = 0$ and c, d are roots of $x^2 - 12x + q = 0$, where a, b, c, d form a G.P., Prove that $(q+p) : (q-p) = 17:15$.
- 15. Find the sum upto n terms:
 $5 + 55 + 555 + \dots$
- 16. Find the co-ordinates of the foot of perpendicular from $(-1, 3)$ to $3x - 4y - 16 = 0$
- 17. Find the equation of the lines through the point $(3, 2)$ which make an angle 45° with the line $x - 2y = 3$.
- 18. Find the equation of the ellipse that satisfies the given conditions:
 centre $(0, 0)$, major axis on the y -axis and Passes through $(3, 2)$ and $(1, 6)$.
- 19. A man running a racecourse notes that the sum of the distances from the two flag posts from him is always $10m$ & the distance between the flag posts is $8m$. Find the distance equation of the posts traced by the man.

20. Find the equation of the set of points P , the sum of whose distances from $A(4, 0, 0)$ & $B(-4, 0, 0)$ is equal to 10.
21. Find the co-ordinates of the points which trisect the line segment joining the points $P(4, 2, -6)$ & $Q(10, -16, 6)$.
22. Find the equation of the hyperbola, whose foci foci $(0, \pm\sqrt{10})$, passing through $(2, 3)$
23. Find the equation of the line passing through the point of intersection of the lines $4x + 7y - 3 = 0$ & $2x - 3y + 1 = 0$ that has equal intercepts on the axes.

SECTION-D.

Q. NO. 24 to 29 are of 6 marks each.

24. The sum of 3 nos. in G.P. is 56. If we subtract 1, 7, 21 from these numbers in that order, we obtain an A.P. Find the numbers.
25. Find the sum to n terms of the series
 $3 \times 1^2 + 5 \times 2^2 + 7 \times 3^2 + \dots$
26. Find the image of the point $(3, 8)$ w.r.t the line $x + 3y = 7$.
27. Find the equation of the line which is equidistant
 a. from parallel lines $9x + 6y - 7 = 0$ & $3x + 2y + 6 = 0$
 b. If p is the length of $\perp r$ from the origin to the line whose intercepts on the axes are a and b , then show that $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$
28. Find the co-ordinates of the vertices, foci, the length

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length of the latus-rectum of the ellipse

(c) $36x^2 + 4y^2 = 144$ (b) $x^2 + ay^2 = 3$

29.
a. If the origin is the centroid of the triangle PQR with vertices P(2a, 2, b) Q(-4, 3b, -10) & R(8, 14, 2c), then find the values of a, b & c.
- b. Find the ratio in which the YZ-plane divides the line segment joining (-2, 4, 7) & (8, -5, 8).

30.
a. Sum of the first p, q and r terms of an A.P. are a, b and c respectively. Prove that $\frac{a}{p}(q-r) + \frac{b}{q}(r-p) + \frac{c}{r}(p-q) = 0$

- b. The ratio of A.M. & G.M. of 2 +ve nos a and b, is m:n. Show that

$$a:b = (m + \sqrt{m^2 - n^2}) : (m - \sqrt{m^2 - n^2})$$