MATHS

BOOKS - NCERT MATHS (HINGLISH)

INTRODUCTION TO THREE DIMENSIONAL GEOMETRY

Short Answer Type Questions

1. Locate the following points

(i) (1,-1,3) (ii) (-1,2,4)

(iii) (-2,-4,-7) (iv) (-4,2,-5)

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2. Name the octant in which each of the following points lie.

(i)(1,2,3), (ii) (4,-2,3)

(4,-2,-5), (iv)(4,2,-5),

(v)(-4,2,5), (iv)(-3,-1,6),

(vii)(2,-4,-7), (viii),(-4,2,-5)

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3. If A,B,C be the feet of perpendiculars from a point p on the X,Y and Z- axes repsectively, then find the coordinates of A,Band C in each of the following where the point P is

(i) A (3,4,2) (ii) B (-5,3,7)

(iii) C (4,-3,-5)

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4. If A,B,and C be the feet of perpendiculars from a point P on the XY, YZ, and ZX- planes respectively, then find the coordinates of A , B

and C in each of the following where the point P is .

(i) (3, 4, 5) (ii) (-5,3,7)

(iii) (4,-3,-5)

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5. How far part are the points (2,0,0) and (-3,0,0) ?

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6. Find the distance from the origin to (6,6,7).

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7. Show that , if $x^2 + y^2 = 1$, then the point $\left(x, y, \sqrt{1 - x^2 - y^2}\right)$ is at is distance 1 unit form the origin.

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8. Show that the point A (1,-1,3), B (2,-4,5) and C (5,-13,11) are collinear.

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9. Three consective vertices of a parallelogram ABCD are A (6, -2 ,4) , B (2, 4,-8) and C (-2,2,4) . Find the condinates of the following

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10. Show that the ΔABC with vertices A (0,4, 1) , B (2, 3, -1) and C (4,5,0) is right angled.

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11. find th third vertex of triangle whose centroid is origin and two vertices are (2,4,6) and (0,-2,5)

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12. Find the centroid of the triangle mid points of whose sides are $(1, 2, -3), (3, 0, 1)$ and $(-1, 1, 4)$

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13. The mid points of the sides of a triangle are $(5, 7, 11), (0, 8, 5)$ and $(2, 3, -1)$Find its vertices and hence find centroid.

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14. If the vertices of a parallelogram ABCD are A (1,2,3) . B (-1,-2,-1) and C (2,3,2) then find the fourth vertex D.

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15. Find the coordinates of the points which trisect the line segment AB, given that $A(2, 1, -3)$ and $B(5, -8, 3)$.

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16. If the origin is the centroid of a triangle ABC having vertices $A(a, 1, 3),\ B(-2, b, -5) and\ C(4, 7, c)$, find the values of $a, b,$.

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17. If A (2,2,-3) B (5,6,9) ,C (2,7,9) be the vertices of a triangle. The internal bisector of the angle A meets BC at the point D, then find the coordinates of D.

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Long Answer Type Questions

1. Show that the three points $A(2, 3, 4),\ B(-1, 2, -3) and\ C(-4, 1, -10)$ are collinear and find the ratio in which C divides AB.

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2. The mid- points of the sides of a tiangle are (1,5,-1) (0,4,-2) and (2,3,4) . Find its vertices and

also find the centroid of the triangle.

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3. Prove that the points (0,-1,-7) , (2,1,-9) and (6,5,-13) are collinear. Find the ratio in which the frist point divides the join of the other two.

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4. Whhat are the coordinates of the vertices of a cube whose edge is 2 units, one of whose vertices coincides with the origin and the thrre edges passing thorugh the origin, coincides with the positive direction of the axes through the origin ?

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Objective Type Questions

1. The distance of point $p(3, 4, 5)$ from the YZ - plane is

A. 3 units

B. 4 units

C. 5 units

D. 15 units

Answer: A

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2. The length of the perpendicular drawn from the point $P(3, 4, 5)$ on y-axis is

A. $\sqrt{41}$

B. $\sqrt{34}$

C. 5

D. none of these

Answer: B

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3. Distance of the point $(3, 4, 5)$ from the origin $(0, 0, 0)$ is

A. $\sqrt{50}$

B. 3

C. 4

D. 5

Answer: A

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4. If the distance between the points $(a, 0, 1)$ and $(0, 1, 2)$ is $\sqrt{27}$ then the value of a is

A. 5

B. ± 5

C. -5

D. none of these

Answer: B

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5. X -axis is the intersection of two planes.

A. XY and XZ

B. YZ and ZX

C. XY and YZ

D. none of these

Answer: A

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6. Write the equation which represents y - axis.

A. $x = 0, y = 0$

B. $y = 0$ and $z = 0$

C. $z = 0, x = 0$

D. none of these

Answer: C

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7. the point $(-2, -3, -4)$ lies in the

A. first octant

B. seventh octant

C. second octant

D. eight octant

Answer: B

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8. The plane parallel to YZ - plane is perpendicular to .....

A. X - axis

B. Y- axis

C. Z - axis

D. none of these

Answer: A

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9. What is the locus of a point (x, y, z) for which $y = 0, z = 0$?

A. equation of x - axis

B. equation of y- axis

C. equation at z -axis

D. none of these

Answer: A

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10. The locus of a point for which $x = 0$ is

A. XY - plane

B. YZ -plane

C. ZX - plane

D. none of these

Answer: B

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11. If a parallelopiped is formed by planes drawn through the points $(5, 8, 10)$ and $(3, 6, 8)$ parallel to the coordinate planes, then the length of diagonal of the parallelopiped is

A. $2\sqrt{3}$

B. $3\sqrt{2}$

C. $\sqrt{2}$

D. $\sqrt{3}$

Answer: A

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12. L is the foot of the perpendicular drawn from a point $p(3, 4, 5)$ on the XY - plane. The coordinates of point L are

A. $3, 0, 0$

B. $0, 4, 5$

C. $3, 0, 5$

D. none of these

Answer: D

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13. L is the foot of the perpendicular drawn from a point $(3, 4, 5)$ on X-axis. The coordinates of L are.

A. 3,0,0

B. 0,4,0

C. 0,0,5

D. none of these

Answer: A

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Fillers

1. The three axes OX, OY and OZ determine .....

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2. The three planes, determine a rectangular parallelopiped which has ..... Of rectangular

faces.

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3. The coordiantes of a point are the perpendicular distance from the ..... On the respectives axes.

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4. The Three coordiantes planes divide the space into ..... Parts.

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5. If a point P lies in YZ- plane , the n the coordinates of a point on YZ-plance is the form.....

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6. The equation of YZ- plane is .....

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7. If the point P lies on Z - axis , then coordinates of p are of the form .....

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8. The equation of Z - axis , are.....

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9. A line is parallel to XY- plane if all the points on the line have equal .....

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10. A line is parallel to X-axis,if all the points on the line have equal.....

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11. 45x=a represent a plane parallel to .....

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12. The plane parallel to YZ- plane is perpendicular to .....

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13. The length of the longest piece of a string that can be stetched straight in a rectangular room whose dimensions are 10,13 and 8 units are .....

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14. If the distance between the points $P(a, 2, 1) and\, Q(1, -1, 1)$ is 5 units find the value of a.

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15. The coordinates of the mid points of sides AB, BC and CA of ABC are $D(1, 2, -3),\ E(3, 0, 1) and\, F(-1, 1, -4)$ respectively. Write the coordinates of its centroid.

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16. Match each item given under the column I to its correct answer given under column II.

Column I		Column II	
(i)	In $-XY$-plane	(a)	Ist octant
(ii)	Point (2, 3, 4) lies in the	(b)	YZ-plane
(iii)	Locus of the points having X coordinate 0 is	(c)	z-coordinate is zero
(iv)	A line is parallel to X-axis if and only	(d)	Z-axis
(v)	If $X = 0$, $y = 0$ taken together will represent the	(e)	plane parallel to XY-plane
(vi)	$z = c$ represent the plane	(f)	If all the points on the line have equal y and z-coordinates
(vii)	Planes $X = a, Y = b$ represent the line	(f)	from the point on the respective
(viii)	Coordinates of a point are the distances from the origin to the feet of perpendiculars	(h)	parallel to Z-axis
(ix)	A ball is the solid region in the space enclosed by a	(i)	disc
(x)	Region in the plane enclosed by a circle is known as a	(j)	sphere

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