WS- Basic

Class XII

CH- XI-The Plane

MCQs

1. The sine of the angle between the straight line $\frac{x-2}{3}=\frac{y-3}{4}=\frac{z-4}{5}$ and the plane $2x-2y+z=5$ is

   (a) $\frac{10}{6\sqrt{5}}$ (b) $\frac{4}{5\sqrt{2}}$ (c) $\frac{2\sqrt{3}}{5}$ (d) $\frac{\sqrt{2}}{10}$

2. Distance between the two planes 2x+3y+4z=4 and 4x+6y+8z=12 is :

   (a) 2 units (b) 4 units (c) 8 units (d) $\frac{2}{\sqrt{29}}$ units

3. The image of the point (1,2,3) on the plane mirror y = 4 is

   (a) (-1,6,-3) (b)(1,2,-3)
   (c)(1,6,3) (d)(1,- 6,3)

4. The value of λ for which the line $\frac{x-1}{2}=\frac{y-1}{3}=\frac{z-1}{\lambda}$ is parallel to the plane $2x+3y+4z=4$ is

   (a) 4 (b) -4 (c) $\frac{-4}{13}$ (d) $\frac{-13}{4}$

5. Equation of the plane which cuts equal intercepts of unit length on the co-ordinate axes is

   (a)x+y+z=1 (b)x+y+z=0 (c) x+y-z=1 (d)x+y+z=2

Fill in the blank type

6. Equation of plane plane parallel to z=0 at a distance of 3 units from it is _____.
7. If the planes x+2y-z=5 and 3x-y+λz=3 are perpendicular to each other then λ is_____ .
8. If the points (1,0,0) ,(0,1,0),(0,0,1) and (k,k,k) are coplanar then k=_____ .
9. The Cartesian equation of the plane $\vec{r}.\left(\hat{\imath}+\hat{\jmath}-\hat{k}\right)=2$ is _____ .
10. The co-ordinates of foot of perpendicular drawn from origin upon the plane x+y+z=1 are_____ .

Answer the followings in a word or in a sentence

11. Check whether the line

$\vec{r} = 2\hat{\imath} - 3\hat{\jmath} - \hat{k} + t(\hat{\imath} - \hat{\jmath} + 2\hat{k})$ *lies in the plane* $\vec{r}.(3\hat{\imath} + \hat{\jmath} - \hat{k}) + 2=0$.

12. Find the equation of a plane that cuts the coordinate axis at (a, 0, 0), (0, b, 0) and (0, 0, c).
13. Find the distance between the planes $\vec{r}.(\hat{\imath} + \hat{\jmath} - \hat{k}) + 4 = 0$ and $\vec{r}.(2\hat{\imath} + 2\hat{\jmath} - 2\hat{k}) + 10 = 0$.
14. Find the equation of plane passing through (1,2,3) and parallel to the plane x+2y+3z=5 .
15. Find the unit normal vector to the plane 3x-4y+5z=5 .

SHORT ANSWER TYPE QUESTIONS

16. Find the vector and cartesian equation of plane passing throuth the point (1,-1,1) and normal to the line joining the points (1,2,5) and (-1,3,1) .
17. If the axes are rectangular and P is the point (2,3,-1) , find the equation of the plane through P at right angles to OP .
18. Reducing to the normal form find the distance of the plane 2x-3y+4z=6 from origin .
19. Find the equation of plane passing through the points (2,5,-3),(-2,-3,5) and (5,3,-3) .
20. Find the equation of a plane passing through the point (-1,-1,2) and perpendicular to the planes 3x+2y-z=1 and 5x-4y+z=5 .
21. Find the equation of plane passing through the intersection of the planes 2x+3y-z+1=0 and x+y-2z+3=0 and perpendicular to the plane 3x-y-2z-4=0 .
22. Find the equation of plane passing through (a,b,c) and parallel to the plane $\vec{r}.(\hat{\imath} + \hat{\jmath} + \hat{k}) = 2$.
23. Show that the points (1,1,1) and (-3,0,1) are equidistant from the plane 3x+4y-12z+13=0 .
24. Find the vector equation of the line passing through the point (1,-1,2) and perpendicular to the plane 2x-y+3z=5.

25. Prove that the lines $\frac{x+1}{-3} = \frac{y-3}{2} = \frac{z+2}{1}$ and $\frac{x}{1} = \frac{y-7}{-3} = \frac{z+7}{2}$ are coplanner.

26. Find the co-ordinates of the point where the line $\frac{x-2}{3} = \frac{y+1}{4} = \frac{z-2}{12}$ meets the plane x-y+z=5 .

27. A plane meets the co-ordinate axes at A , B and C respectively such that centroid of triangle ABC is (1,-2,3) . Find the equation of plane .

28. Find the equation of the plane that bisects the line segment joining the points (1,2,3) and (3,4,5) at right angles .

29. Find the vector equation of the plane with intercepts 3,-4 and 2 on the co-ordinate axes .

30. Find the angle between the planes 2x+6y+6z=7 and 3x+4y-5z=8 at right angles .