**Straight Lines**

**Type – 1**

**Choose the most appropriate option (a, b, c or d).**

Q 1. The sum of the intercepts made by the plane ax + by + cz = d on the three axes of reference is

(a) a + b + c (b)  (c)  (d) 

Q 2. If the sum of the reciprocals of the intercepts made by the plane ax + by + cz = 1 on the three axes is 1 then the plane always passes through the point

(a) (2,-1,0) (b) (1,1,1) (c) (-1,-1,-1) (d) 

Q 3. The direction cosines of the perpendicular from the origin to the plane 3x - y + 4z = 5 are

(a) 4,-1,3 (b) 3, -1,4 (c)  (d) 

Q 4. The length of the perpendicular from the origin to the plane 2x + 3y + λz = 1 (λ > 0) is. Then λ is

(a) 2 (b) 3 (c) 0 (d) 1

Q 5. The direction cosines of the normal to the plane 5(x -2)-3(y-z) are

(a) 5,-3,3 (b)  (c)  (d) 

Q 6. A plane passing through the line joining the points .4(1, -3, 5) and B(4,1, -1) is turned about AB till it passes through the origin. The equation of the plane in the new position is

(a) 3x + 4y - 6z = 0 (b) 2x - 21y + 13z = 0 (c) 2x - 21y -13z = 0 (d) none of these

Q 7. The equations of a line passing through the point (-1,0,3) and perpendicular to the plane 4x + 3y - 5z = 12 are

(a)  (b) 5(3x - 1) = 20(y - 1) = - 4(z - ) (c)  (d) none of these

Q 8. The equation of the plane passing through the lineand parallel to the direction whose direction numbers are 3,4,2 is

(a) 14x - 5y - 11z = 19 (b) 3x + 4y + 2z + 1 = 0 (c) 2x - y+ 3z = 3. (d) none of these

Q 9. If the linelies in the plane 3x - 2y + 5z = 0 then X is

(a) 1 (b)  (c)  (d) no possible value

Q 10. The equations of the line of intersection of the planes x + y + z = 2 and 3x - y + 2z = 5 in symmetric form are

(a)  (b)  (c)  (d) none of these

Q 11. The direction cosines of a line parallel to the planes 3x + 4y + z = 0 and x - 2y - 3z = 5 are

(a) (-1,1,-1) (b)  (c)  (d) no line possible

Q 12. If(3,λ,μ) is a point on the line 2x + y + z - 3 = 0 = x - 2y + z- 1 then

(a)  (b)  (c) λ = – 1, μ = – 5 (d) L – 5, μ = – 1

Q 13. The equations of the perpendicular from the point (-2,4,1) to the plane 7x - 2y + 3z = 1 are

(a) (b)  (c)  (d) none of these

Q 14. P is a point on the y-z plane, making equal angles with the y-axis and 2-axis and at a distance 2 from the origin. M is the foot of the perpendicular from P to the plane 3x + y - = 2.The coordinates of M are

(a)  (b) (1, –3, −2) (c)  (d) none of these

Q 15. The distance of the point (2, 0, -3) from the plane 5x - 12y = 0 is

(a)  (b)  (c)  (d) none of these

Q 16. The image of the point P(α, β, γ) by the plane lx + my + nz = 0 is the point Q(α',β',γ’).Then

(a) α2 + β2 + γ2 = l2 + m2 + n2 (b) α2 + β2 + γ2 = α’2 + β’2 + γ’2

(c) αα2 + ββ’ + γγ’ 0 (d) l(α – α’) + m(β – β’) + n (γ – y’) = 0

Q 17. The image of the point (2, -1,1) by the plane 3x + 4y - 5z = 0 is

(a) (-2,1,-1) (b)  (c)  (d) none of these

Q 18. If the image of the point (1,1,1) by a plane be (3, -1,5) then the equation of the plane is

(a) x - y + 2z = 8 (b) x-y + 2z = 16 (c) x - y + 2z = 14 (d) none of these

Q 19. The angle between the line x = y = z and the plane 4x - 3y + 5z = 2 is

(a)  (b)  (c)  (d) 

Q 20. The equation of the plane passing through the origin and containing the line of intersection of the planes 5x + y - 3z = 2 and x + 2y + 3z = 1 is

(a) 2x + y = 1 (b) x - y -3z = 0 (c) 4x - y - 6z = 0 (d) 7x + 5y + 3z = 0

Q 21. What is the equation of the plane passing through the line of intersection of the planes x - y + 3z = 4 and 2x + y + 3z = 5 and parallel to the plane x + y + z = 1?

(a) x + y + z = 2 (b) x + y + z + 2 = 0 (c) 2x = y + s (d) no plane exists

Q 22. What is the equation of the plane passing through the line 3x + y - 5z = 2 = x - 2y + 3z and perpendicular to the plane x - y + z = 3?

(a) 2x + 3y + z = 2 (b) 3x + 2y - z = 2 (c) 7(x - z) = 6 (d) no plane exists

Q 23. The equation of the plane passing through the line x + y - 2 = 0 = x - y - 2z and at a distance 1 from the point (0,1,1) is

(a) 2x + y - z - 3 =  (2 - x - y) (b) x - y - 2z +  (x + y - 2) = 0

(c) x + y - 2 =  (x - y - 2z) (d) none of these

Q 24. The angle between the planes x + y + z = 0 and 3x - 4y + 5z = 0 is

(a) cos-1 (b)  (c)  (d) 

Q 25. The variable plane (2k + 1)x + (3 - λ)y + z = 4 always passes through the line

(a)  (b)  (c)  (d) none of these

Q 26. The distance between the planes 4x - 5y + 3z = 5 and 4x - 5y + 3z + 2 = 0 is

(a)  (b) 7 (c)  (d) 3

Q 27. The distance between the planes x + 2y - 3z - 4 = 0 and 2x + 4y - 6z = t along the line is

(a)  (b)  (c) 5 (d) none of these

Q 28. The shortest distance between the lines x-y = 0 = 2x + z and x + y- 2 = 0 = 3x - y + z - 1 is

(a) 11x – 3y = 0 (b) 3x + 11y = 0 (c)

Q 29. Which of the following planes is equally inclined to the planes 4x + 3y - 5z = 0 and 5x - 12y + 13z = 0?

(a) 11x - 3 y = 0 (b) 3x + 11y = 0 (c) 3x + 11y = 65z (d) none of these

Q 30. The equation of the plane bisecting the angle between the planes 3x + Ay = 4 and 6x - 2y + 3z + 5 = 0 that contains the origin, is

(a) 9x - 38y + 15z + 43 = 0 (b) 51x + 18y + 15z = 13 (c) 9x + 2y + 3z + 1 = 0 (d) none of these

Q 31. The equation of the plane bisecting the acute angle between the planes x - y + z - 1 = 0 and x + y + z = 2is

(a) x + z =  (b) 2y = 1 (c) x - y - z = 3 (d) none of these

Q 32. The direction cosines of the projection of the lineon the plane 2x + y - 3z = 5 are

(a) 2, –1, 1 (b)  (c)  (d) 

Q 33. Two systems of rectangular axes have the same origin. If a plane cuts them at distances a, b, c and a', b', d from the origin then"

(a) a-2 + b02 - c-2 + a'-2 + b'-2 - c'-2 = 0 (b) a-2- b-2 - c-2 + a'-2- b'-2 - c-2= 0

(c) a-2 + b-2 + c-2 - a'-2 - b'-2-c'-2 = 0 (d) none of these

Q 34. The lines x = ay + b,z = xy + d and x = a'y + b', z = c'y + d' will be perpendicular if and only if

(a) aa' + bb' + cc' = 0 (b) (a +a'(b + b’) + c + c' = 0

(c) aa' + cc' + 1 = 0 (d) aa' + bb'+ cc' + 1 = 0

Q 35. Which of the following planes intersects the planes x - y + 2z = 3 and 4x + 3y - z = 1 along the same line?

(a) 11x + 10y - 5z = 0 (b) 7x + 7y - 4z = 0 (c) 5x + 2y + z = 2 (d) none of these

Q 36. The linecuts the plane z + y + z = 1 at P. If the foot of the perpendicular from P to a plane be (3,-4,1) then the equation of the plane is

(a) 3x - 2y - 2 = 0 (b) 2x - y + 2z = 12 (c) 2x - 10y + 5z = 51 (d) none of these

Q 37. A variable plane at a distance of 1 unit from the origin cuts the coordinate axes at A, B and C. If the centroid D(x,y,z) satisfies the relation x-2 + y-2 + z-2 = k then the value of k is

(a) 3 (b) 1 (c) (d) 9

**Type 2**

**Choose the correct options. One or more options may be correct.**

Q 38. A plane through the linehas the equation

(a) x + y + z = 0 (b) 3x + 2y - z = 1 (c) 4x + y - 2z = 3 (d) 3x + 2y + z = 0

Q 39. The equation of a plane is 2x - y - 3z = 5 and A(1, 1,1), B(2,1,-3), C(1, -2, -2) and D(-3,1, 2) are four points. Which of the following line segments are intersected by the plane?

(a) AD (b) AB (c) AC (d) BC

**Answers**

1c 2b 3c 4a 5b 6c 7b 8a 9b 10b

11c 12b 13a 14d 15a 16b 17c 18a 19b 20b

21a 22c 23a 24d 25c 26c 27d 28b 29a 30b

31a 32d 33c 34c 35a 36c 37d 38ac 39bc