MATHS

BOOKS - NIKITA MATHS (HINGLISH)

PLANE

Multiole Choice Questions

1. A point (x, y, z) moves parallel to xy-plane. Which of the three variables x, y, z remains fixed? (A) x (B) y (C) z (D) xand y

A. x

B. y

C. z

D. x and y

Answer: C

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2. In three dimenisonal space , the equation by+cz = 0 represents

A. a plane containing x-axis

B. a plane containing Y- axis

C. a plane containing Z-axis

D. a plance containing point (abc)

Answer: A

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3. In the space the equation $by+cz+d=0$ represents a plane perpendicular to the plane

A. YOZ

B. ZOX

C. XOY

D. z=k

Answer: A

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4. The equation of a plane parallel to x-axis is

A. ax+by+cz+d =0

B. ax+by+d =0

C. by+cz+d =0

D. ax+cz+d =0

Answer: C

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5. The graph of the equation $x^2 + y^2 = 0$ in the three dimensional space is (A) x-axis (B) y-axis (C) z-axis (D) xy-plane

A. X-axis

B. Y-axis

C. Z-axis

D. YZ-plane

Answer: A

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6. If the line $\bar{r} = \bar{a} + \lambda \bar{b}$ is parallel to the plane $\bar{r}.\,\bar{n} = p,$ then

A. $\bar{b}.\,\bar{n} = 0$

B. $\bar{b}.\,\bar{n} = p$

C. $\bar{b} \times \bar{n} = 0$

D. $\bar{b} \times \bar{n} = \bar{a}$

Answer: A

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7. The angle between two planes is

A. the angles between the lines parallel to the planes from any point .

B. the angle between the tangents to them from any point

C. the angle between the normals to them from any point.

D. the angle between the lines perpendicular or parallel to the planes from any point.

Answer: C

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8. If the equation of two lines are given by $\bar{r} = \overline{a_1} + \lambda \overline{b_1}$ and $\bar{r} = \overline{a_2} + \mu \overline{b_2}$, where λ and μ are parmater , then the angle θ between the lines is

A. $\cos\theta = \frac{\overline{a_1}.\overline{b_2}}{|\overline{a_1}||\overline{b_2}|}$

B. $\cos\theta = \frac{\overline{a_2}.\overline{b_1}}{|\overline{a_2}||\overline{b_1}|}$

C. $\cos\theta = \frac{\overline{b_1}.\overline{b_2}}{|\overline{b_1}||\overline{b_2}|}$

D. $\cos\theta = \frac{\overline{a_1}.\overline{a_2}}{|\overline{a_1}||\overline{a_2}|}$

Answer: C

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9. If is the angle between plane $\bar{r}.\bar{n} = p$ and the line $\bar{r}.\bar{a} = \lambda\bar{b}$

A. $\cos\ \theta = \frac{\bar{b}.\bar{n}}{|\bar{b}||\bar{n}|}$

B. $\cos\ \theta = \frac{\bar{a}.\bar{n}}{|\bar{a}||\bar{n}|}$

C. $\sin\ \theta = \frac{\bar{a}.\bar{n}}{|\bar{a}||\bar{n}|}$

D. $\sin\ \theta = \frac{\bar{b}.\bar{n}}{|\bar{b}||\bar{n}|}$

Answer: D

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10. The length of perpendicular drawn from point A $(\bar{a})$ to the plance $\bar{r}.\bar{n} = p$ is

A. $\left|\frac{(\bar{a}.\bar{n}) + p}{|\bar{n}|}\right|$

B. $\left|\frac{(\bar{a}.\bar{n}) - p}{|\bar{n}|}\right|$

C. $\left|\frac{(\bar{a} \times \bar{n}) + p}{|\bar{n}|}\right|$

D. $\left|\frac{(\bar{a} \times \bar{n}) - p}{|\bar{n}|}\right|$

Answer: B

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11. The equation to the perpendicular from the point $(\alpha, \beta\gamma)$ to the plane $ax + by + cz + d = 0$ is

A. x + y+ z = abc

B. $a(x-\alpha)+b(y-\beta)+c(z-\gamma)=0$

C. $a(x-\alpha)+b(y-\beta)+c(z-\gamma)=abc$

D. $\frac{x-\alpha}{a}=\frac{y-\beta}{b}=\frac{z-\gamma}{c}$

Answer: D

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12. The planne x= 0 divides the join of $(-2,3,4)$ and $(1,-2,3)$ in the ratio

A. $2:1$

B. $3:2$

C. $4:-3$

D. $2:5$

Answer: A

13. XOZ-plane divides the join of (2,3,1) and (6,7,1) in the ratio a. 3:7 b. 2:7 c. -3:7 d. -2:7

A. $3:7$

B. $-2:7$

C. $-3:7$

D. $7:3$

Answer: C

14. The ration in which the line joining points $(3, 4, -7)$ and $(4, 2, 1)$ is divided by XY - plane is

A. $7:1$

B. $-3:4$

C. $-2:1$

D. $2:3$

Answer: A

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15. The co-ordinate of the point in which the line joining the points (3, 5, -7) and (-2, 1, 8) is inscribed by YZ-plane are

A. $\left(0, \frac{13}{5}, 2\right)$

B. (2,13 ,1)

C. $\left(\frac{13}{5}, \frac{6}{5}, \frac{3}{5}\right)$

D. $\left(2, 0, \frac{13}{5}\right)$

Answer: A

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16. The ration in which the plane 4x+5y-3z=8 divides the line joining the point $(-2, 1, 5)$ and $(3, 3, 2)$ is

A. $3:2$

B. $5:3$

C. $1:4$

D. $2:1$

Answer: D

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17. Find the vector equation of the plane passing through a point having position vector $3\hat{i} - 2\hat{j} + 3\hat{k}$ and perpendicular to the vector $4\hat{i} + 3\hat{j} + 2\hat{k}$.

A. $\bar{r}.\left(4\hat{i} + 3\hat{j} + 2\hat{k}\right) = 12$

B. $\bar{r}.\left(4\hat{i}+3\hat{j}+2\hat{k}\right)=16$

C. $\bar{r}.\left(4\hat{i}+3\hat{j}+2\hat{k}\right)=8$

D. $\bar{r}.\left(4\hat{i}+3\hat{j}+2\hat{k}\right)=20$

Answer: C

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18. Find the vector equation of the plane passing through the point having position vector $2\hat{i}+3\hat{j}+4\hat{k}$ and perpendicular to the vector $2\hat{i}+\hat{j}-2\hat{k}$.

A. $\bar{r}.\left(2\hat{i}+\hat{j}-2\hat{k}\right)=-1$

B. $\bar{r}.\left(2\hat{i}+\hat{j}-2\hat{k}\right)=8$

C. $\bar{r}.\left(2\hat{i}+\hat{j}-2\hat{k}\right)=9$

D. $\bar{r}.\left(2\hat{i}+\hat{j}-2\hat{k}\right)=15$

Answer: A

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19. Find the vector and Cartesian equation of the plane that passes throgh the point (1,0,-2) and the normal vector to the plane is $\hat{i}+\hat{j}-\hat{k}$.

A. $\bar{r}.\left(\hat{i}+\hat{j}+\hat{k}\right)=-1$

B. $\bar{r}.\left(\hat{i}+\hat{j}+\hat{k}\right)=1$

C. $\bar{r}.\left(\hat{i}+\hat{j}+\hat{k}\right)=-2$

D. $\bar{r}.\left(\hat{i}+\hat{j}+\hat{k}\right)=2$

Answer: A

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20. The equation of the plane passing through the point (-1, 2, 1) and perpendicular to the line joining the points (-3, 1, 2) and (2, 3, 4) is $\cdots\cdots$

A. $\bar{r}.\left(5\hat{i}+2\hat{j}+2\hat{k}\right)=-5$

B. $\bar{r}.\left(5\hat{i}+2\hat{j}+2\hat{k}\right)=4$

C. $\bar{r}.\left(5\hat{i}+2\hat{j}+2\hat{k}\right)=1$

D. $\bar{r}.\left(5\hat{i}+2\hat{j}+2\hat{k}\right)=2$

Answer: C

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21. The eyation of plane passing through the point (1 ,1 ,2) having 2 ,3 ,2 as direction ratios of normal to the plance is

A. $\bar{r}.\left(2\hat{i}+3\hat{j}+2\hat{k}\right)=2$

B. $\bar{r}.\left(2\hat{i}+3\hat{j}+2\hat{k}\right)=9$

C. $\bar{r}.\left(2\hat{i}+3\hat{j}+2\hat{k}\right)=4$

D. $\bar{r}.\left(2\hat{i}+3\hat{j}+2\hat{k}\right)=5$

Answer: B

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22. Find the equation of the plane passing through the point $(1, -1, 2)$ having $2, 3, 2$ as direction ratios of normal to the plane.

A. $\bar{r}.\left(3\hat{i}+2\hat{j}+3\hat{k}\right)=11$

B. $\bar{r}.\left(3\hat{i}+2\hat{j}+3\hat{k}\right)=5$

C. $\bar{r}.\left(3\hat{i}+2\hat{j}+3\hat{k}\right)=1$

D. $\bar{r}.\left(3\hat{i}+2\hat{j}+3\hat{k}\right)=-1$

Answer: D

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23. If the foot of the perpendicular drawn from the point (0,0,0) to the plane is (4,-2,-5) then the equation of the plane is ...

A. $\bar{r}.\left(\hat{i}+2\hat{j}+3\hat{k}\right)=1$

B. $\bar{r}.\left(\hat{i}+2\hat{j}+3\hat{k}\right)=14$

C. $\bar{r}.\left(\hat{i}+2\hat{j}+3\hat{k}\right)=9$

D. $\bar{r}.\left(\hat{i}+2\hat{j}+3\hat{k}\right)=4$

Answer: B

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24. If $|\bar{n}|=3\sqrt{3}$ such that $\bar{n}$ makes equal acute angles with co-ordinate is

A. $3\left(\hat{i}+\hat{j}+\hat{k}\right)$

B. $\hat{i}+\hat{j}+\hat{k}$

C. $\sqrt{3}\left(\hat{i}+\hat{j}+\hat{k}\right)$

D. $3\sqrt{3}\left(\hat{i}+\hat{j}+\hat{k}\right)$

Answer: A

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25. if $|\bar{n}| = 3\sqrt{3}$ such that $\bar{n}$ makes equal acute angles with co-ordinate axes , then the equation of plance in vector form passing througt $(-1, 1, 2)$ is

A. $\bar{r}.\left(\hat{i} + \hat{j} + \hat{k}\right) = 1$

B. $\bar{r}.\left(\hat{i} + \hat{j} + \hat{k}\right) = 2$

C. $\bar{r}.\left(\hat{i} + \hat{j} + \hat{k}\right) = \sqrt{3}$

D. $\bar{r}.\left(\hat{i} + \hat{j} + \hat{k}\right) = 3$

Answer: B

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26. if $|\bar{n}| = 3\sqrt{3}$ such that $\bar{n}$ makes eequal acute angles with co-ordinate axes , then the equation of plane in cartesian form passing through $(-1, 1, 2)$ is

A. $x + y + z = 3$

B. $x+y+z=\sqrt{3}$

C. $x+y+z=2$

D. $x+y+z=1$

Answer: C

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27. Find the vector and cartesian equations of the plane that passes through the point $(0, 1, -2)$ and normal to the plane is $hti+\hat{j}+\hat{k}$.

A. $x+y+z=1$

B. $x+y+z=-1$

C. $x+y+z=-2$

D. $x+y+z=3$

Answer: B

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28. Find the vector equation of the plane passing through the point having position vector $2\hat{i} + 3\hat{j} + 4\hat{k}$ and perpendicular to the vector $2\hat{i} + \hat{j} - 2\hat{k}$.

A. $2x + y - 2z = -7$

B. $2x + y - 2z = -9$

C. $2x + y - 2z = 1$

D. $2x + y - 2z = -1$

Answer: D

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29. If the foot of the perpendicular drawn from the point (0,0,0) to the plane is (4,-2,-5) then the equation of the plane is . . .

A. $4x - 2y - 5z = 16$

B. $4x - 2y - 5z = 4$

C. $4x - 2y - 5z = 25$

D. $4x - 2y - 5z = 45$

Answer: D

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30. The equation of plance passing through the point $(1, 1 - 2)$ having 3, 2,3 as direction ratios of normal to the plance is

A. $3x + 2y + 3z = -1$

B. $3x + 2y + 3z = 1$

C. $3x + 2y + 3z = -11$

D. $3x + 2y + 3z = 11$

Answer: A

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31. The equation of plance passing through the point (1 ,1 -2) having 2, 3, 2 as direction ratios of normal to the plance is

A. $2x + 3y + 2z = 7$

B. $2x + 3y + 2z = -7$

C. $2x + 3y + 2z = 9$

D. $2x + 3y + 2z = -9$

Answer: C

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32. The equation of plane passing throught the point (1 ,2 ,3) and the direction cosines of the normal to which are l, m, n is

A. $lx + my + nz = l + 2m + 3n$

B. $lx + my + nz = l$

C. $\frac{x-1}{l}+\frac{y-2}{m}+\frac{z-3}{n}=0$

D. $\frac{lx}{1}+\frac{my}{2}+\frac{nz}{3}=0$

Answer: A

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33. The equation of plance through the points (1 , 1 ,0) and (2 , 2 ,3) and parallel to the line $\frac{x-1}{1}=\frac{y-1}{-2}=\frac{z-2}{3}$ is

A. $\bar{r}.\left(10\hat{i}-\hat{j}-4\hat{k}\right)=9$

B. $\bar{r}.\left(10\hat{i}-\hat{j}-4\hat{k}\right)=-9$

C. $\bar{r}.\left(10\hat{i}-\hat{j}+4\hat{k}\right)=9$

D. $\bar{r}.\left(10\hat{i}-\hat{j}+4\hat{k}\right)=-9$

Answer: A

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34. The equation of plane passing throught $(1, 1, 1)$ and $(1, -1, -1)$ and is perpendicular to $2x - y + z + 5 = 0$ is

A. $2x + 5y + z - 8 = 0$

B. $x + y - z - 1 = 0$

C. $2x + 5y + z + 4 = 0$

D. $x - y + z + 1 = 0$

Answer: B

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35. The equation of the plane passing through the points (0,1,2) and (-1,0,3) and perpendicular to the plane $2x + 3y + z = 5$ is

A. $3x - 4y + 18z + 32 = 0$

B. $3x + 4y - 18z + 32 = 0$

C. $4x + 3y - 17z + 31 = 0$

D. $4x - 3y + z + 1 = 0$

Answer: D

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36. Find the vector equation of the plane which is at a distance of 5 units from the origin and which is normal to the vector $2\hat{i} + \hat{j} + 2\hat{k}$.

A. $\bar{r}.\left(2\hat{i} + \hat{j} + 2\hat{k}\right) = 3$

B. $\bar{r}.\left(2\hat{i} + \hat{j} + 2\hat{k}\right) = 5$

C. $\bar{r}.\left(2\hat{i} + \hat{j} + 2\hat{k}\right) = 15$

D. $\bar{r}.\left(2\hat{i} + \hat{j} + 2\hat{k}\right) = 45$

Answer: C

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37. Find the vector equation of the plane which is at a distance of 6 units from the origin and which is normal to the vector $2\hat{i} - \hat{j} + 2\hat{k}$.

A. $\bar{r}.\left(2\hat{i} - \hat{j} + 2\hat{k}\right) = 3$

B. $\bar{r}.\left(2\hat{i} - \hat{j} + 2\hat{k}\right) = 6$

C. $\bar{r}.\left(2\hat{i} - \hat{j} + 2\hat{k}\right) = 9$

D. $\bar{r}.\left(2\hat{i} - \hat{j} + 2\hat{k}\right) = 18$

Answer: D

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38. Reduce the equation $\bar{r} \cdot \left(3\hat{i} - 4\hat{j} + 12\hat{k}\right) = 3$ to the normal form and hence find the length of perpendicular from the origin to the plane.

A. $\bar{r}.\left(\frac{3}{13}\hat{i} - \frac{4}{13}\hat{j} + \frac{12}{13}\hat{k}\right) = 3$

B. $\bar{r}.\left(\frac{3}{13}\hat{i} - \frac{4}{13}\hat{j} + \frac{12}{13}\hat{k}\right) = 13$

C. $\bar{r}.\left(\frac{3}{13}\hat{i} - \frac{4}{13}\hat{j} + \frac{12}{13}\hat{k}\right) = \frac{3}{13}$

D. $\bar{r}.\left(\frac{3}{13}\hat{i}-\frac{4}{13}\hat{j}+\frac{12}{13}\hat{k}\right)=\frac{13}{3}$

Answer: C

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39. Reduce the equation $\bar{r}\cdot\left(3\hat{i}-4\hat{j}+12\hat{k}\right)=3$ to the normal form and hence find the length of perpendicular from the origin to the plane.

A. $\frac{3}{13}$

B. $\frac{4}{13}$

C. $\frac{12}{13}$

D. $\frac{13}{3}$

Answer: A

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40. Equation of the plane is $\bar{r}\cdot\left(3\hat{i}-4\hat{j}+12\hat{k}\right)=8$

Find the length of the perpendicular from the origin to the plane.

A. $\bar{r}.\left(\frac{3}{13}\hat{i}-\frac{4}{13}\hat{j}+\frac{12}{13}\hat{k}\right)=\frac{3}{13}$

B. $\bar{r}.\left(\frac{3}{13}\hat{i}-\frac{4}{13}\hat{j}+\frac{12}{13}\hat{k}\right)=\frac{8}{13}$

C. $\bar{r}.\left(\frac{3}{13}\hat{i}-\frac{4}{13}\hat{j}+\frac{12}{13}\hat{k}\right)=\frac{4}{13}$

D. $\bar{r}.\left(\frac{3}{13}\hat{i}-\frac{4}{13}\hat{j}+\frac{12}{13}\hat{k}\right)=\frac{12}{13}$

Answer: B

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41. Equation of the plane is $\bar{r}\cdot\left(3\hat{i}-4\hat{j}+12\hat{k}\right)=8$

Find the length of the perpendicular from the origin to the plane.

A. $\frac{3}{13}$

B. $\frac{4}{13}$

C. $\frac{12}{13}$

D. $\frac{8}{13}$

Answer: D

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42. If a line joining (1 ,2 ,0) and (4 ,13 ,5) is perpendicular to aplane ,then the coefficients of x , y , and z in equation of the plane are respectively

A. 5 ,15 ,5

B. 3 , 11 , 5

C. $3, \ -11, 5$

D. $-5, \ -15, 5$

Answer: B

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43. The direaction cosines of perpendicular from orgin to the plane $\bar{r}.\left(2\hat{i}+3\hat{j}+6\hat{k}\right)+7=0$ are

A. $\frac{-2}{7}, \frac{-3}{7}, \frac{-6}{7}$

B. $\frac{2}{7}, \frac{3}{7}, \frac{6}{7}$

C. $\frac{2}{7}, \frac{-3}{7}, \frac{6}{7}$

D. $\frac{2}{7}, \frac{-3}{7}, \frac{-6}{7}$

Answer: A

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44. The direction cosines of the normal to the plance $4x+8y+z=5$ are

A. $\frac{4}{5}, \frac{8}{5}, \frac{1}{5}$

B. $\frac{4}{9}, \frac{8}{9}, \frac{1}{9}$

C. $\frac{4}{45}, \frac{8}{45}, \frac{1}{45}$

D. $\frac{4}{3}, \frac{8}{3}, \frac{1}{3}$

Answer: B

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45. The vector equation of the plane $\bar{r} = \left(2\hat{i} + \hat{k}\right) + \lambda\hat{i} + \mu\left(\hat{i} + 2\hat{j} - 3\hat{k}\right)$ is

A. $\bar{r}.\left(2\hat{i} + 3\hat{j} + 2\hat{k}\right) = 2$

B. $\bar{r}.\left(2\hat{i} + 3\hat{j} - 2\hat{k}\right) = 2$

C. $\bar{r}.\left(3\hat{j} + 2\hat{k}\right) = 2$

D. $\bar{r}.\left(3\hat{j} - 2\hat{k}\right) = 2$

Answer: C

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46. Find the vector equation of the following planes in cartesian form :

$$\vec{r} = \hat{i} - \hat{j} + \lambda\left(\hat{i} + \hat{j} + \hat{k}\right) + \mu\left(\hat{i} - 2\hat{j} + 3\hat{k}\right).$$

A. $\bar{r}.\left(5\hat{i} - 2\hat{j} - 3\hat{k}\right) = 7$

B. $\bar{r}.\left(5\hat{i} - 2\hat{j} - 3\hat{k}\right) = 5$

C. $\bar{r}.\left(5\hat{i} + 2\hat{j} - 3\hat{k}\right) = 7$

D. $\bar{r}.\left(5\hat{i} + 2\hat{j} - 3\hat{k}\right) = 5$

Answer: A

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47. Let a plane passing through point $(-1, 1, 1)$ is parallel to the vector $2\hat{i} + 3\hat{j} - 7\hat{k}$ and the line $\bar{r} = \left(\hat{i} - 2\hat{j} - \hat{k}\right) + \lambda\left(3\hat{i} - 8\hat{j} + 2\hat{k}\right)$. The vector equation of plane is

A. $\bar{r}.\left(2\hat{i} + \hat{j} + \hat{k}\right) = 2$

B. $\bar{r}.\left(2\hat{i} + \hat{j} + \hat{k}\right) = 0$

C. $\bar{r}.\left(2\hat{i}-\hat{j}-\hat{k}\right)=2$

D. $\bar{r}.\left(2\hat{i}-\hat{j}-\hat{k}\right)=0$

Answer: B

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48. The vector equation of the plance passing through the point $(-1, 2, -5)$ and parallel to vectors $4\hat{i}-\hat{j}+3\hat{k}$ and $\hat{i}+\hat{j}-\hat{k}$ is

A. $\bar{r}.\left(-2\hat{i}+7\hat{j}+5\hat{k}\right)=13$

B. $\bar{r}.\left(-2\hat{i}+7\hat{j}+5\hat{k}\right)=-13$

C. $\bar{r}.\left(-2\hat{i}+7\hat{j}+5\hat{k}\right)=-9$

D. $\bar{r}.\left(-2\hat{i}+7\hat{j}+5\hat{k}\right)=9$

Answer: C

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49. Find the cartesian form of the equation of the plane.

$\bar{r} = \left(\hat{i} + \hat{j}\right) + s\left(\hat{i} - \hat{j} + 2\hat{k}\right) + t\left(\hat{i} + 2\hat{j} + \hat{k}\right).$

A. $5x + y + 3z = -4$

B. $5x + y + 3z = 4$

C. $5x - y - 3z = -4$

D. $3x - y - z = 2$

Answer: D

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50. The cartesian form of the equation of plane $\bar{r} = (s + t)\hat{i} + (2 + t)\hat{j} + (3s + 2t)\hat{k}$ is

A. $3x + y + z = -2$

B. $3x + y + z = 2$

C. $3x - y - z = -2$

D. $3x - y - z = 2$

Answer: C

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51. The equation of plane passing through point (3 ,4 ,5) and parallel to the vectors $\hat{i} + 2\hat{j} + 3\hat{k}$ and $3\hat{i} + 2\hat{j} + 4\hat{k}$ is

A. $x + 5y - 4z + 6 = 0$

B. $2x + 5y - 4z - 6 = 0$

C. $2x - 5y + z - 6 = 0$

D. $2x + y + 4z - 7 = 0$

Answer: B

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52. Find the vector equation of the plane passing through the intersection of the planes $\bar{r} \cdot (2\hat{i} + 2\hat{j} - 3\hat{k}) = 8, \bar{r} \cdot (2\hat{i} + 4\hat{j} + 3\hat{k}) = 7$ and through the point (2, 1, 3).

A. $\bar{r}.(42\hat{i} + 64\hat{j} + 3\hat{k}) = 85$

B. $\bar{r}.(21\hat{i} + 32\hat{j} + 6\hat{k}) = 85$

C. $\bar{r}.(42\hat{i} + 64\hat{j} + 3\hat{k}) = 157$

D. $\bar{r}.(21\hat{i} + 32\hat{j} + 6\hat{k}) = 157$

Answer: C

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53. The vector equation of the plane passing through the intersection of the planes $\bar{r}.(\hat{i} + \hat{j} + \hat{k}) = 8$ and $\bar{r}.(2\hat{i} + 3\hat{j} + 4\hat{k}) = 3$ and the point (1 , 0 , 2) is

A. $\bar{r}.\left(17\hat{i}+22\hat{j}+27\hat{k}\right)=71$

B. $\bar{r}.\left(17\hat{i}+22\hat{j}+27\hat{k}\right)=41$

C. $\bar{r}.\left(11\hat{i}+16\hat{j}+21\hat{k}\right)=71$

D. $\bar{r}.\left(11\hat{i}+16\hat{j}+21\hat{k}\right)=41$

Answer: A

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54. The equation of plane passing through the intersection of the planes $\bar{r}.\left(\hat{i}+\hat{j}+\hat{k}\right)=2$ and $\bar{r}.\left(2\hat{i}+3\hat{j}+\hat{k}\right)=4$ and parallel to X - axis is

A. $\bar{r}.\left(-\hat{j}+\hat{k}\right)=0$

B. $\bar{r}.\left(\hat{j}+\hat{k}\right)=0$

C. $\bar{r}.\left(-\hat{j}+\hat{k}\right)=4$

D. $\bar{r}.\left(-\hat{j}+\hat{k}\right)=-2$

Answer: A

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55. The vector equation of the plane passing tgrough the intersection of planes $\bar{r}.\left(2\hat{i}-3\hat{j}+4\hat{k}\right)=1$ and $\bar{r}.\left(\hat{i}-\hat{j}\right)+4=0$ and perpendicular to the plane $\bar{r}.\left(2\bar{i}-\hat{j}+\hat{k}\right)=-5$ is

A. $\bar{r}.\left(5\bar{i}-2\hat{j}+12\hat{k}\right)=47$

B. $\bar{r}.\left(-5\bar{i}+2\hat{j}+12\hat{k}\right)=47$

C. $\bar{r}.\left(5\bar{i}-2\hat{j}+4\hat{k}\right)=47$

D. $\bar{r}.\left(-5\bar{i}+2\hat{j}+4\hat{k}\right)=47$

Answer: B

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56. The direation ratios of the normal to the plane passing through the point (2 ,1 ,0) and the line of intersection of the planes $x-2y+3z=4$ and $x-y+z=3$ is

A. 1 , 1 , 0

B. $1, \ -1, 0$

C. 1 ,0 ,1

D. $1, 0, \ -1$

Answer: D

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57. Find the equation of the plane passing through the intersection of the planes

3x + 2y - z + 1 = 0 and x + y + z - 2 = 0 and the point (2, 2, 1).

A. $x - 4y - 13z = 23$

B. $x + 4y - 13z = 23$

C. $x - 4y + 13z = 23$

D. $x + 4y + 13z = 23$

Answer: D

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58. Find the equation of a plane containing the line of intersection of the planes $x + y + z - 6 = 0 and 2x + 3y + 4z + 5 = 0$ passing through $(1, 1, 1)$.

A. $10x + 13y + 16z + 39 = 0$

B. $10x - 13y + 16z + 39 = 0$

C. $10x + 13y - 16z + 39 = 0$

D. $10x + 13y - 16z - 39 = 0$

Answer: D

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59. The equation of plane passing through the line of intersection of planes $x+y+z-2=0, 2x+3y+z-4=0$ and parallel to X-axis is

A. $x-y=0$

B. $y-2z=5$

C. $y-z=0$

D. $x-y=3$

Answer: C

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60. The plane through the intersection of the planes $x+y+z=1$ and $2x+3y-z+4=0$ and parallel to Y-axis also passes through the point

A. $x+z-3=0$

B. $x+4z-7=0$

C. $x+y-3=0$

D. $y + 2z + 5 = 0$

Answer: B

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61. The equation of plane passing through the line of intersection of planes $2x - y + z = 3, 4x - 3y - 5z + 9 = 0$ and parallel to the line $\frac{x+1}{2} = \frac{y+3}{4} = \frac{z-3}{5}$ is

A. $11x - 3y - 2z - 54 = 0$

B. $11x - 3y + 2z - 54 = 0$

C. $11x + 3y - 2z - 54 = 0$

D. $11x - 3y - 2z + 54 = 0$

Answer: A

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62. Find the equation of the plane whch passes through the line $a_1x + b_1y + c_1y + c_1z + d_1 = 0 a_2x + b_2y + c_2z + d_2 = 0$ and which is parallel to the line $\frac{x-\alpha}{l} = \frac{y-\beta}{m} = \frac{z-\gamma}{n}$

A.

$$(a_2l + b_2m + c_2n)(a_1x + b_1y + c_1z + d_1) + (a_1l + b_1m + c_1n)(a_2x$$

B.

$$(a_2l + b_2m + c_2n)(a_1x + b_1y + c_1z + d_1) - (a_1l + b_1m + c_1n)(a_2x$$

C.

$$(a_1l + b_1m + c_1n)(a_1x + b_1y + c_1z + d_1) + (a_2l + b_2m + c_1n)(a_2x$$

D.

$$(a_1l + b_1m + c_1n)(a_1x + b_1y + c_1z + d_1) - (a_2l + b_2m + c_1n)(a_2x$$

Answer: B

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63. The equation of plane through the line of intersection of the planes $2x + 3y + 4z - 7 = 0, x + y + z - 1 = 0$ and perpendicular to the plane $x + y + z - 1 = 0$

A. $x + 2y + 3z = 6$

B. $x - 2y + z = 6$

C. $2x - y + z = 5$

D. $x - 2y + 6z = 3$

Answer: A

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64. Find the vector equation of the plane passing through the point $\hat{i} + \hat{j} - 2\hat{k}$ and $\hat{i} + 2\hat{j} + \hat{k}, 2\hat{i} - \hat{j} + \hat{k}$.

A. $\bar{r}.\left(9\hat{i} + 3\hat{j} - \hat{k}\right) = 4$

B. $\bar{r}.\left(9\hat{i} + 3\hat{j} - \hat{k}\right) = 8$

C. $\bar{r}.\left(9\hat{i}+3\hat{k}-\hat{k}\right)=14$

D. $\bar{r}.\left(9\hat{i}+3\hat{k}-\hat{k}\right)=16$

Answer: C

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65. The equation of plane in vector form passing through the points $(1, 0, 1), (1, -1, 1)$ and $(4, -3, 2)$ is

A. $\bar{r}.\left(\hat{i}-3\hat{k}\right)=2$

B. $\bar{r}.\left(-\hat{i}+3\hat{k}\right)=2$

C. $\bar{r}.\left(\hat{i}-3\hat{k}\right)=4$

D. $\bar{r}.\left(-\hat{i}+3\hat{k}\right)=4$

Answer: B

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66. The vector equation of the plane passing through the points $(1, -2, 1), (2, -1, -3)$ and $(0, 1, 5)$ is

A. $\bar{r}.\left(\hat{i}-4\hat{k}\right)=5$

B. $\bar{r}.\left(\hat{i}+4\hat{k}\right)=5$

C. $\bar{r}.\left(\hat{i}-4\hat{k}\right)=5$

D. $\bar{r}.\left(\hat{i}+4\hat{k}\right)=5$

Answer: D

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67. The vector equation of the plane passing through the points $(1, 12), (0, 2, 3)$ and $(4, 5, 6)$ is

A. $\bar{r}.\left(7\hat{j}+7\hat{k}\right)=-7$

B. $\bar{r}.\left(7\hat{j}+7\hat{k}\right)=7$

C. $\bar{r}.\left(7\hat{j}-7\hat{k}\right)=-7$

D. $\bar{r}.\left(7\hat{j}-7\hat{k}\right)=7$

Answer: C

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68. The cartesian equation of the plane passing through the points $(1, 1, 2), (0, 2, 3)$ and $(4, 5, 6)$ is

A. $y-z+1=0$

B. $y+z-1=0$

C. $y-z-1=0$

D. $y+z+1=0$

Answer: A

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69. Find the equation of the plane passing through the line $\frac{x-1}{5} = \frac{y+2}{6} = \frac{z-3}{4}$ and point $(4, 3, 7)$.

A. $4x + 8y + 7z = 41$

B. $4x - 8y + 7z = 41$

C. $4x - 8y - 7z = 41$

D. $4x - 8y + 7z = 39$

Answer: B

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70. Write the equation of the plane $3x + 4y - 2z = 5$ in the vector form .

A. $\bar{r}.\left(3\hat{i} + 4\hat{j} + 2\hat{k}\right) = 5$

B. $\bar{r}.\left(3\hat{i} + 4\hat{j} - 2\hat{k}\right) = 5$

C. $\bar{r}.\left(3\hat{i} - 4\hat{j} + 2\hat{k}\right) = 5$

D. $\bar{r}.\left(3\hat{i}-4\hat{j}-2\hat{k}\right)=5$

Answer: B

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71. If $(-3, 5, -8)$ is the foot of the perpendicular drawn from origin to a plane , then the equation of plane is

A. $3x+y-5z-11=0$

B. $3x-5y+8z+98=0$

C. $x-5y+8z-15=0$

D. $2x+4y-3z+29=0$

Answer: B

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72. The foot of the perpendicular drow from origin to the plane $x + y + 3z - 4 = 0$ is

A. $\left(\frac{1}{11}, \frac{1}{11}, \frac{3}{11}\right)$

B. $\left(\frac{4}{11}, \frac{4}{11}, \frac{12}{11}\right)$

C. $\left(\frac{1}{\sqrt{11}}, \frac{1}{\sqrt{11}}, \frac{3}{\sqrt{11}}\right)$

D. $\left(\frac{4}{\sqrt{11}}, \frac{4}{\sqrt{11}}, \frac{12}{\sqrt{11}}\right)$

Answer: B

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73. The foot of the perpendicular drown from to the origin to the plane $x + y + 3z - 8 = 0$ is

A. $\left(\frac{8}{11}, \frac{8}{11}, \frac{24}{11}\right)$

B. $\left(\frac{1}{11}, \frac{1}{12}, \frac{3}{11}\right)$

C. $\left(\frac{3}{11}, \frac{5}{11}, \frac{4}{11}\right)$

D. $(4, 4, 11)$

Answer: A

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74. The length of the perpendicular from origin to the plane $x - 3y + 4z = 6$ is

A. $\frac{3}{\sqrt{26}}$

B. $\frac{6}{\sqrt{26}}$

C. $\frac{3}{\sqrt{13}}$

D. $\frac{6}{\sqrt{13}}$

Answer: B

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75. The disatance of the point $(1, 0, 2)$ from the point of intersection of the line $\frac{x-2}{3}=\frac{y+1}{4}=\frac{z-2}{12}$ and the plane $x-y+z=16$, is

A. $3\sqrt{21}$

B. $2\sqrt{14}$

C. 13

D. 8

Answer: C

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76. If plane passes through the point (1, 1,1) and is perpendicular to the line, $\frac{x-1}{3}=\frac{y-1}{0}=\frac{z-1}{4}$, then its perpendicular distance from the origin is

A. $\frac{4}{25}$

B. $\frac{4}{5}$

C. $\frac{7}{25}$

D. $\frac{7}{5}$

Answer: D

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77. The foot of the perpendicular from the point A(7,14,5) to the plane $2x + 4y - z = 2$ is

A. (13 ,26 ,8)

B. $(-13, -26, 8)$

C. (1 , 2, 8)

D. $(-1, -2, -8)$

Answer: C

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78. Find the length and the foot of the perpendicular from the point $(7, 14, 5)$ to the plane $2x + 4y - z = 2$.

A. $\sqrt{21}$

B. $4\sqrt{21}$

C. $2\sqrt{21}$

D. $3\sqrt{21}$

Answer: D

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79. The equation of line passing through the point (2, 3, 4) and perpendicular to plane $2x + 3y + z + 5 = 0$ is

A. $\dfrac{x-2}{1} = \dfrac{y-3}{2} = \dfrac{z-4}{3}$

B. $\dfrac{x-2}{3} = \dfrac{y-3}{2} = \dfrac{z-4}{1}$

C. $\dfrac{x-2}{2} = \dfrac{y-3}{3} = \dfrac{z-4}{1}$

D. $\frac{x-2}{1}=\frac{y-3}{3}=\frac{z-4}{2}$

Answer: C

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80. Find the angles at which the normal vector to tehplane $4x+8y+z=5$ is inclined to the coordinate axes.

A. $\cos^{-1}\left(\frac{8}{9}\right)$

B. $\cos^{-1}\left(\frac{1}{9}\right)$

C. $\cos^{-1}\left(\frac{2}{9}\right)$

D. $\cos^{-1}\left(\frac{4}{9}\right)$

Answer: D

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81. Find the angles at which the normal vector to tehplane $4x+8y+z=5$ is inclined to the coordinate axes.

A. $\cos^{-1}\left(\frac{8}{9}\right)$

B. $\cos^{-1}\left(\frac{1}{9}\right)$

C. $\cos^{-1}\left(\frac{2}{9}\right)$

D. $\cos^{-1}\left(\frac{4}{9}\right)$

Answer: A

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82. The angle at which the normal vector to the plane $4x+8y+z=5$ inclined to the Z-axis is

A. $\cos^{-1}\left(\frac{8}{9}\right)$

B. $\cos^{-1}\left(\frac{1}{9}\right)$

C. $\cos^{-1}\left(\frac{2}{9}\right)$

D. $\cos^{-1}\left(\frac{4}{9}\right)$

Answer: B

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83. The angle between the line of intersection of planes $\bar{r}.\left(\hat{i}+3\hat{j}-2\hat{k}\right)=0, \bar{r}.\left(2\hat{i}+4\hat{j}-3\hat{k}\right)=0$ and $\hat{i}$ is

A. $\cos^{-1}\left(\frac{1}{\sqrt{6}}\right)$

B. $\cos^{-1}\left(\frac{4}{\sqrt{6}}\right)$

C. $\cos^{-1}\left(\frac{8}{\sqrt{6}}\right)$

D. $\cos^{-1}\left(\frac{2}{\sqrt{6}}\right)$

Answer: A

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84. The angle between the line of intersection of planes $\bar{r}.\left(\hat{i}+3\hat{j}-2\hat{k}\right)=0, \bar{r}.\left(2\hat{i}+4\hat{j}-3\hat{k}\right)=0$ and $\hat{j}$ is

A. $\cos^{-1}\left(\frac{1}{\sqrt{6}}\right)$

B. $\cos^{-1}\left(\frac{4}{\sqrt{6}}\right)$

C. $\cos^{-1}\left(\frac{8}{\sqrt{6}}\right)$

D. $\cos^{-1}\left(\frac{2}{\sqrt{6}}\right)$

Answer: A

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85. The angle between the line of intersection of planes $\bar{r}.\left(\hat{i}+3\hat{j}-2\hat{k}\right)=0, \bar{r}.\left(2\hat{i}+4\hat{j}-3\hat{k}\right)=0$ and $\hat{k}$ is

A. $\cos^{-1}\left(\frac{1}{\sqrt{6}}\right)$

B. $\cos^{-1}\left(\frac{4}{\sqrt{6}}\right)$

C. $\cos^{-1}\left(\frac{8}{\sqrt{6}}\right)$

D. $\cos^{-1}\left(\frac{2}{\sqrt{6}}\right)$

Answer: D

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86. Find the angle between the planes whose vector equations are

$\bar{r}\cdot\left(2\hat{i}+2\hat{j}-3\hat{k}\right)=5$ and $\bar{r}\cdot\left(\hat{i}-2\hat{j}+\hat{k}\right)=7.$

A. $\cos^{-1}\left(\frac{11}{\sqrt{238}}\right)$

B. $\cos^{-1}\left(\frac{13}{\sqrt{238}}\right)$

C. $\cos^{-1}\left(\frac{15}{\sqrt{238}}\right)$

D. $\cos^{-1}\left(\frac{9}{\sqrt{238}}\right)$

Answer: A

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87. The angle between planes $\bar{r}.\left(2\hat{i}+\hat{j}-\hat{k}\right)=3$ and $\bar{r}.\left(\hat{i}+2\hat{j}+\hat{k}\right)=1$ is

A. 30°

B. 45°

C. 60°

D. 90°

Answer: C

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88. If the angle between the planes $r.\left(m\hat{i}-\hat{j}+2\hat{k}\right)+3=0$ and $r\cdot\left(2\hat{i}-m\hat{j}-\hat{k}\right)-5=0$ is $\frac{\pi}{3}$, then m=

A. 2

B. ± 3

C. 3

D. -2

Answer: C

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89. The acute angle between the two planes $x + y + 2z$

= 3 and 3x - 2y + 2z = 7 ` is ....

A. $\cos^{-1}\left(\frac{3}{\sqrt{102}}\right)$

B. $\cos^{-1}\left(\frac{1}{\sqrt{102}}\right)$

C. $\cos^{-1}\left(\frac{9}{\sqrt{102}}\right)$

D. $\cos^{-1}\left(\frac{5}{\sqrt{102}}\right)$

Answer: D

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90. The angle between planes $3x - 6y + 2z = 8$ and $2x + 2y - 2z = 10$ is

A. $\cos^{-1}\left(\frac{10}{7\sqrt{3}}\right)$

B. $\cos^{-1}\left(\frac{5}{7\sqrt{3}}\right)$

C. $\cos^{-1}\left(\frac{5}{14\sqrt{3}}\right)$

D. $\cos^{-1}\left(\frac{5\sqrt{3}}{7}\right)$

Answer: B

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91. The angle between planes $3x - 6y + 2z = 8$ and $2x + 2y - 2z = 10$ is

A. 30°

B. 60°

C. 45°

D. 90°

Answer: D

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92. If the planes $ax + by + cz + d = 0$ and $a_1x + b_1y + c_1z + d_1 = 0$ be mutually perpendicular , then

A. $\frac{a}{a_1} = \frac{b}{b_1} = \frac{c}{c_1}$

B. $\frac{a}{a_1} = \frac{b}{b_1} = \frac{c}{c_1} = 0$

C. $aa_1 + bb_1 + cc_1 = 1$

D. $aa_1 + bb_1 + cc_1 = 0$

Answer: D

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93. The value of k for which the planes $3x - 6y - 2z = 7$ and $2x + y - kz = 5$ areperpendicular to each other is

A. 0

B. 1

C. 2

D. 3

Answer: A

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94. If the planes $3x - 2y + 2z + 17 = 0$ and $4x + 3y - kz = 25$ are mutually perpendicular , then k=

A. 3

B. -3

C. 9

D. -9

Answer: A

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95. The angle between the line $\bar{r} = (\hat{i} + \hat{j} - \hat{k}) + \lambda(\hat{i} - \hat{j} + \hat{k})$ and the plane $\bar{r}.(\hat{i} - 2\hat{j} + 3\hat{k}) = 5$ is

A. $\sin^{-1}\left(\frac{6}{\sqrt{7}}\right)$

B. $\sin^{-1}\left(\frac{6}{\sqrt{21}}\right)$

C. $\sin^{-1}\left(\frac{6}{\sqrt{7}}\right)$

D. $\sin^{-1}\left(\frac{7}{\sqrt{6}}\right)$

Answer: C

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96. The angle between the line $\bar{r} = \left(\hat{i} + 2\hat{j} - \hat{k}\right) + \lambda\left(\hat{i} - \hat{j} + \hat{k}\right)$ and the plane `barr.(2hati-hatj+hatk)=5 is

A. $\sin^{-1}\left(\frac{4\sqrt{2}}{3}\right)$

B. $\sin^{-1}\left(\frac{2\sqrt{2}}{3}\right)$

C. $\sin^{-1}\left(\frac{2}{3\sqrt{2}}\right)$

D. $\sin^{-1}\left(\frac{2\sqrt{3}}{6}\right)$

Answer: B

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97. Find the angle between the line $\bar{r} = \left(\hat{i} + 2\hat{j} + \hat{k}\right) + \lambda\left(\hat{i} + \hat{j} + \hat{k}\right)$ and the plane $\bar{r} \cdot \left(2\hat{i} - \hat{j} + \hat{k}\right) = 5.$

A. $\cos^{-1}\left(\frac{\sqrt{2}}{3}\right)$

B. $\sin^{-1}\left(\frac{\sqrt{2}}{3}\right)$

C. $\tan^{-1}\left(\frac{\sqrt{2}}{3}\right)$

D. $\sin^{-1}\left(\frac{\sqrt{2}}{\sqrt{3}}\right)$

Answer: B

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98. Find the angle between line $\frac{x+1}{3} = \frac{y-1}{2} = \frac{z-2}{4}$ and the plane $2x + y - 3z + 4 = 0.$

A. 30°

B. 60°

C. $\sin^{-1}\left(\frac{-4}{\sqrt{406}}\right)$

D. $\operatorname{con}^{-1}\left(\frac{4}{\sqrt{406}}\right)$

Answer: C

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99. Find the angle between the line $\frac{x-1}{3} = \frac{y+1}{2} = \frac{z+2}{4}$ and the plane $2x + y - 3z + 4 = 0$.

A. $\sin^{-1}\left(\frac{-8}{\sqrt{406}}\right)$

B. $\sin^{-1}\left(\frac{-4}{\sqrt{406}}\right)$

C. $\sin^{-1}\left(\frac{-16}{\sqrt{406}}\right)$

D. $\sin^{-1}\left(\frac{-2}{\sqrt{406}}\right)$

Answer: B

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100. The acute angle between the line $\frac{x+1}{2} = \frac{y}{3} = \frac{z-3}{6}$ and the plane $10x + 2y - 11z = 8$ is

A. $\sin^{-1}\left(\frac{4}{21}\right)$

B. $\sin^{-1}\left(\frac{4}{7}\right)$

C. $\sin^{-1}\left(\frac{8}{21}\right)$

D. $\sin^{-1}\left(\frac{8}{7}\right)$

Answer: C

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101. If the angle θ between the line $\frac{x+1}{1}=\frac{y-1}{2}=\frac{z-2}{2}$ and the plane $2x-y+\sqrt{\lambda z}+4=0$ is such that $\sin\theta=\frac{1}{3}$, the value of λ is

A. $\frac{-4}{3}$

B. $\frac{4}{3}$

C. $\frac{-3}{5}$

D. $\frac{5}{3}$

Answer: D

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102. If the angle θ between Z-axis and the plane $3x - 4y + 5z + 7 = 0$ is $\cos^{-1}(k)$, then $k =$

A. $\frac{1}{2}$

B. $\frac{1}{\sqrt{2}}$

C. 2

D. $\sqrt{2}$

Answer: B

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103. If the angle between the line $x = \frac{y-1}{2} = (z-3)(\lambda)$ and the plane $x + 2y + 3z = 4 is \cos^{-1}\left(\sqrt{\frac{5}{14}}\right)$, then λ equals

A. $\frac{2}{3}$

B. $\frac{3}{2}$

C. $\frac{-2}{3}$

D. $\frac{-3}{2}$

Answer: A

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104. The angle between the line $\frac{x}{3}=\frac{y}{4}=\frac{z}{5}$ and the plane $2x+y-2z=7$ is

A. 0°

B. 30°

C. 60°

D. 90°

Answer: A

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105. If the line $\frac{x-4}{1}=\frac{y-2}{1}=\frac{z-k}{2}$ lies exactly on the plane $2x-4y+z=7$, the value of k is

A. 4

B. 7

C. -7

D. no real value

Answer: B

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106. The value of k such that $\frac{x-4}{1}=\frac{y-2}{1}=\frac{z-k}{2}$ lies in the plane $2x-4y=z=7$ is a. 7 b. -7 c. no real value d. 4

A. 7

B. -7

C. 3

D. 4

Answer: B

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107. The equation of plane passing through the point (1 ,2 ,3) and parallel to the plane $2x+3y-4z=0$ is

A. $2x+3y+4z-4=0$

B. $2x+3y+4z+4=0$

C. $2x-3y+4z+4=0$

D. $2x+3y-4z+4=0$

Answer: D

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108. The equation of the plane containing the line $2x - 5y + z = 3, x + y + 4z = 5$ and parallel to the plane $x + 3y + 6z = 1$, is

A. $x + 3y + 6z = 7$

B. $2x + 6y + 12z = -13$

C. $2x + 6y + 12z = 13$

D. $x + 3y + 6z = -7$

Answer: A

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109. Perpendicular are drawn from points on the line $\frac{x+2}{2} = \frac{y+1}{-1} = \frac{z}{3}$ to the plane $x + y + z = 3$. The feet of perpendiculars lie on the line.

A. $\frac{x}{2} = \frac{y-1}{-7} = \frac{z-2}{-5}$

B. $\frac{x}{2} = \frac{y-1}{7} = \frac{z-2}{5}$

C. $\frac{x}{2} = \frac{y-1}{-7} = \frac{z-2}{5}$

D. $\frac{x}{2} = \frac{y-1}{7} = \frac{z-2}{-5}$

Answer: C

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110. If the plane passing through the origin and parallel to the line $\frac{x-1}{2} = \frac{y+3}{-1} = \frac{z+1}{-2}$ such that the distance between them is $\frac{5}{3}$ then the equation of the plane is

A. $x + 2y + 2z = 0$

B. $x - 2y - 2z = 0$

C. $x + 2y - 2z = 0$

D. $x - 2y + 2z = 0$

Answer: D

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111. If $\lambda x+4y+5z=7, 4x+4\lambda y+10z-14=0$ represent the same plane , then λ =

A. 1

B. 2

C. 0

D. 3

Answer: B

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112. If the line $\vec{r}=\left(\hat{i}-2\hat{j}+3\hat{k}\right)+\lambda\left(2\hat{i}+\hat{j}+2\hat{k}\right)$ is parallel to the plane $\vec{r}\left(3\hat{i}-2\hat{j}+m\hat{k}\right)=10$ then value of m is

A. 2

B. -2

C. 4

D. -4

Answer: B

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113. If the line $\bar{r} = (\hat{i} - \hat{j} + 3\hat{k}) + \lambda(\hat{i} - \hat{j} + m\hat{k})$ is parallel to the plane $\bar{r}.\,(\hat{i} + 5\hat{j} + \hat{k}) = 8$, then $m =$

A. -6

B. 6

C. -4

D. 4

Answer: D

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114. The plane $2x+3y+kz-7=0$ is parallel to the line whose direction ratios are $2, -3, 1,$ then k =

A. 5

B. 8

C. 1

D. 4

Answer: A

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115. Find the distance between the parallel planes $2x-y+2z+3=0 and 4x-2y+4z+5=0.$

A. $\frac{2}{3}$

B. $\frac{5}{6}$

C. $\frac{1}{5}$

D. $\frac{1}{6}$

Answer: D

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116. Equation of the plane parallel to the planes $x + 2y + 3z - 5 = 0$, $x + 2y + 3z - 7 = 0$ and equidistant from them is

A. $x + 2y + 3z + 12 = 0$

B. $x + 2y + 3z - 1 = 0$

C. $x + 2y + 3z - 6 = 0$

D. $x + 2y + 3z + 6 = 0$

Answer: C

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117. If the planes $x - cy - bz = 0, cx - y + az = 0$ and $bx + ay - z = 0$ pass through a line, then the value of $a^2 + b^2 + c^2 + 2abc$ is....

A. 0

B. -1

C. 1

D. 2

Answer: C

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118. If from a point $P(a, b, c)$ perpendiculars $PAandPB$ are drawn to $YZandZX - planes$ find the vectors equation of the plane OAB.

A. $\bar{r}.\left(bc\hat{i} + ac\hat{j} + ab\hat{k}\right)$

B. $\bar{r}.\left(bc\hat{i} - ac\hat{j} - ab\hat{k}\right)$

C. $\bar{r}.\left(bc\hat{i} - ac\hat{j} + ab\hat{k}\right)$

D. $\bar{r}.\left(bc\hat{i} + ac\hat{j} - ab\hat{k}\right)$

Answer: D

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119. If A and B are foot of perpendicular drawn from point Q(a,b,c) to the planes yz and zx, then equation of plane through the point A,B, and O is

A. $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 0$

B. $\frac{x}{a} - \frac{y}{b} + \frac{z}{c} = 0$

C. $\frac{x}{a} - \frac{y}{b} - \frac{z}{c} = 0$

D. $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 0$

Answer: A

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120. If a line joining the points $(1, -1, 2)$ and $(3, 2, -1)$ is perpendicular to the plane passing through the origin then the vector equation of the palne is

A. $\bar{r}.\left(2\hat{i} + 3\hat{j} - 3\hat{k}\right) = 0$

B. $\bar{r}.\left(2\hat{i} + 3\hat{j} - 3\hat{k}\right) = 5$

C. $\bar{r}.\left(\hat{i} - \hat{j} + 2\hat{k}\right) = 0$

D. $\bar{r}.\left(3\hat{i} + 2\hat{j} - \hat{k}\right) = 5$

Answer: A

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121. The equation of the plane containing the lines $\overrightarrow{r} = \left(\hat{i} + \hat{j} - \hat{k}\right) + \lambda\left(3\hat{i} - \hat{j}\right)$ and $\overrightarrow{r} = \left(4\hat{i} - \hat{k}\right) + \mu\Big)2\hat{i} + 3\hat{k}\Big)$, is

A. coplanar

B. non-coplanar

C. parallel

D. perpendicular

Answer: B

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122. Show that the lines

$\vec{r} = \left(2\hat{j} - 3\hat{k}\right) + \lambda\left(\hat{i} + 2\hat{j} + 3\hat{k}\right)$ and

$\vec{r} = \left(2\hat{i} + 6\hat{j} + 3\hat{k}\right) + \mu\left(2\hat{i} + 3\hat{j} + 4\hat{k}\right)$

are coplanar. Also the find the equation of the plane passing through these lines.

A. coplanar

B. non-coplanar

C. parallel

D. perpendicular

Answer: A

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123. Show that the lines

$\overrightarrow{r} = \left(2\hat{j} - 3\hat{k}\right) + \lambda\left(\hat{i} + 2\hat{j} + 3\hat{k}\right)$ and

$\overrightarrow{r} = \left(2\hat{i} + 6\hat{j} + 3\hat{k}\right) + \mu\left(2\hat{i} + 3\hat{j} + 4\hat{k}\right)$

are coplanar. Also the find the equation of the plane passing through these lines.

A. $\bar{r}.\left(-\hat{i} + 2\hat{j} + \hat{k}\right) = 7$

B. $\bar{r}.\left(-\hat{i} + 2\hat{j} + \hat{k}\right) = -5$

C. $\bar{r}.\left(-\hat{i} + 2\hat{j} - \hat{k}\right) = 7$

D. $\bar{r}.\left(-\hat{i} + 2\hat{j} - \hat{k}\right) = -5$

Answer: C

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124. Prove that the lines $\frac{x+1}{3}=\frac{y+3}{5}=\frac{z+5}{7} and \frac{x-2}{1}=\frac{y-4}{4}=\frac{z-6}{7}$ are coplanar . Aslo, find the plane containing these two lines.

A. coplanar

B. non-coplanar

C. parallel

D. perpendicular

Answer: A

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125. The equation of plane containing the lines

$$\bar{r}=\left(2\hat{j}-3\hat{k}\right)+\lambda\left(\hat{i}+2\hat{j}+3\hat{k}\right)$$

$$\bar{r}=\left(2\hat{i}+6\hat{j}+3\hat{k}\right)+\lambda\left(2\hat{i}+3\hat{j}+4\hat{k}\right)$$

A. $x-2y-z=0$

B. $x - 2y + z = 0$

C. $x + 2y - z = 0$

D. $x + 2y + z = 0$

Answer: B

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126. Show that the lines $\frac{x+3}{-3} = \frac{y-1}{1} = \frac{z-5}{5}$ and $\frac{x+1}{-1} = \frac{y-2}{2} = \frac{z-5}{5}$ are coplanar.

A. coplanar

B. non-coplanar

C. parallel

D. perpendicular

Answer: A

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127. Show that the lines $\frac{x+3}{-3}=\frac{y-1}{1}=\frac{z-5}{5}$ and $\frac{x+1}{-1}=\frac{y-2}{2}=\frac{z-5}{5}$ and are coplanar. Also, find the equation of the plane containing these lines.

A. $x+2y+z=0$

B. $x-2y-z=0$

C. $x+2y-z=0$

D. $x-2y+z=0$

Answer: D

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128. दर्शाइए कि रेखाएँ

$$\frac{x-a+d}{\alpha-\delta}=\frac{y-a}{\alpha}=\frac{z-a-d}{\alpha+\delta}$$

और $\frac{x-b+c}{\beta-\gamma}=\frac{y-b}{\beta}=\frac{z-b-c}{\beta+\gamma}$ सह-तलीय हैं |

A. coplanar

B. non-coplanar

C. parallel

D. perpendicular

Answer: A

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129. If the lines $x=1+s, y=-3-\lambda s, z=1+\lambda s$ and $x=\frac{t}{s}, y=1+t, z=2-t$ are coplanar, then λ is equal to

A. 2

B. -2

C. 0

D. 1

Answer: B

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130. Find the distance of the point $\hat{i}+2\hat{j}-\hat{k}$ from the plane $\bar{r}\cdot\left(\hat{i}-2\hat{j}+4\hat{k}\right)=10.$

A. $\dfrac{10}{\sqrt{21}}$

B. $\dfrac{17}{\sqrt{21}}$

C. $\dfrac{7}{\sqrt{21}}$

D. $\dfrac{3}{\sqrt{21}}$

Answer: B

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131. Find the distance of the point $2\hat{i}+\hat{j}+\hat{k}\Big)$ from the plane $\bar{r}\cdot\left(\hat{i}+2\hat{j}+4\hat{k}\right)=13.$

A. $\sqrt{21}$

B. $\frac{13}{\sqrt{21}}$

C. $\frac{8}{\sqrt{21}}$

D. $\frac{5}{\sqrt{21}}$

Answer: D

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132. If p_1 and p_2 are the lengths of perpendiculars from the points $\hat{i} - \hat{j} + 3\hat{k}$ and $3\hat{i} + 4\hat{j} + 3\hat{k}$ to the plane $\bar{r} \cdot \left(5\hat{i} + 2\hat{j} - 7\hat{k}\right) + 8 = 0$, then

A. $d_1 < d_2$

B. $d_1 > d_2$

C. $d_1 = d_2$

D. $d_1 = 2d_2$

Answer: C

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133. If the points $(1, 1, p)$ and $(-3, 0, 1)$ be equidistant from the plane $\vec{r}.\left(3\hat{i} + 4\hat{j} - 12\hat{k}\right) + 13$, find the values of p.

A. $-1, \dfrac{-7}{3}$

B. $1, \dfrac{-7}{3}$

C. $-1, \dfrac{7}{3}$

D. $1, \dfrac{7}{3}$

Answer: D

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134. If the line $\bar{r} = \left(\hat{i} + \hat{j}\right) + \lambda\left(2\hat{i} + \hat{j} + 4\hat{k}\right)$ is parallel to the plane $\bar{r}.\left(-2\hat{i} + \hat{k}\right) = 5$ then the distance between them is

A. $\frac{2}{\sqrt{5}}$

B. $\frac{3}{\sqrt{5}}$

C. $\frac{7}{\sqrt{5}}$

D. $\frac{4}{\sqrt{5}}$

Answer: C

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135. The distance of point $(2, -1, 0) \omega m the pla \ne$ 2x+y+2z+8=0` is

A. $\frac{7}{5}$

B. $\frac{5}{3}$

C. $\frac{8}{3}$

D. $\frac{11}{3}$

Answer: D

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136. Show that the points $(-3, 0, 1)$ and $(1, 1, 1)$ are equidistant from the plane $3x + 4y - 12z + 13 = 0.$

A. $d_1 < d_2$

B. $d_1 > d_2$

C. $d_1 = d_2$

D. $d_1 = 2d_2$

Answer: C

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137. If d_1 and d_2 are the distances of points (2 ,3 ,4) and (1 , 1 ,4) respectively from the plane $3x - 6y + 2z + 11 = 0$, then d_1 and d_2 are the roots of

A. $16d^2 + 23d + 7 = 0$

B. $16d^2 - 23d + 7 = 0$

C. $7d^2 + 23d + 16 = 0$

D. $7d^2 - 23d + 16 = 0$

Answer: D

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138. Find the equations of the planes parallel to the plane $x - 2y + 2z - 4 = 0$, which are at a unit distance from the point (1, 2, 3).

A. $x - 2y + 2z = 0, x - 2y + 2z + 6 = 0$

B. $x - 2y + 2z = 0, x - 2y + 2z - 6 = 0$

C. $x - 2y + 2z = 12, x - 2y + 2z + 6 = 0$

D. $x - 2y + 2z = 12, x - 2y + 2z - 6 = 0$

Answer: B

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139. Find the equations of the plane parallel to the plane $x + 2y + 2z + 8 = 0$

which are at a distance of 2 units from the point (1, 1, 2).

A. $x + 2y + 2z - 1 = 0, x + 2y + 2z + 13 = 0$

B. $x + 2y + 2z + 1 = 0, x + 2y + 2z - 13 = 0$

C. $x + 2y + 2z - 1 = 0, x + 2y + 2z - 13 = 0$

D. $x + 2y + 2z + 1 = 0, x + 2y + 2z + 13 = 0$

Answer: C

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140. If the distance of the point (1,1,1) from the origin is half its distance from the plane $x + y + z + k = 0$, then k is equal to

A. ± 3

B. ± 6

C. $-3, 9$

D. $3, \ -9$

Answer: D

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141. If the perpendicular distance of point A other than origin from the plane $x+y+z=k$ is equal to the distance of the plane from the origin ,then A $\equiv$

A. $(2k, k, \ -k)$

B. $(2k, \ -k, k)$

C. $(2k, \ -k, 2k)$

D. $(2k, k, k)$

Answer: A

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142. The plane $ax+by+cz=105$ contain the lines $2x-y+z=3$ and $3x+y+z=5$. If point (2 ,1, -1) is at a distance of $\frac{1}{\sqrt{6}}$ from the plane , then $a+b+c=$

A. 0

B. 110

C. -70

D. -105

Answer: B

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143. Which of the following is correct?

A. If a variable plane moves in such a way that the sum of the reciprocals of its intercepts on the co-ordinate axes is constant , then the plane passes through the fixed point .

B. If a varible plane moves in such a way that the sum of the reciprocals of its intercepts on the co-ordinate axes is constant ,then the plane passes through the origin.

C. If a varible plane moves in such a way that the difference of the reciprocals of its intercepts on the co-ordinate axes is constant then the plane passes through the fixed point.

D. If a varible plane moves in such a way that the differnce of the reciprocals of its intercepts on the co-ordinate axes is constant , then the plane passes through the origin.

Answer: A

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144. The equation of a plane which cuts equal intercepts of unit length on the axes is

A. $x+y+z=0$

B. $x+y+z=1$

C. $x+y-z=1$

D. $x+y+z=a$

Answer: B

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145. If the plane $x-3y+5z=d$ passes through the point $(1, 2, 4)$, then the intercepts cut by it on the axes of x, y, z are respectively-

A. $15, -5, 3$

B. $1, -5, 3$

C. $-10, 5, -3$

D. $1, \ -6, 20$

Answer: A

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146. If a plane meets the co-ordinate axes in A ,B , C such that the centroid of triangle ABC is (p ,q , r) then the equation of plane is

A. $\frac{x}{p}+\frac{y}{q}+\frac{z}{r}=3$

B. $\frac{x}{p}+\frac{y}{q}+\frac{z}{r}=1$

C. $\frac{x}{p}+\frac{y}{q}+\frac{z}{r}=0$

D. $\frac{x}{p}+\frac{y}{q}+\frac{z}{r}=2$

Answer: A

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147. If a variable plane which is at a constant distance 3p from the origin cut the co-ordinate axes at points A ,B , C , then locus of the centroid of ΔABC is

A. $\frac{1}{x^2}+\frac{1}{y^2}+\frac{1}{z^2}=\frac{1}{9p^2}$

B. $\frac{1}{x^2}+\frac{1}{y^2}+\frac{1}{z^2}=\frac{1}{3p^2}$

C. $\frac{1}{x^2}+\frac{1}{y^2}+\frac{1}{z^2}=\frac{1}{p^2}$

D. $\frac{1}{x^2}+\frac{1}{y^2}+\frac{1}{z^2}=\frac{3}{p^2}$

Answer: C

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148. If plane meets co-ordinates axes at A , B ,C such that centroid of triangle ABC is $\left(\frac{1}{3},\frac{2}{3},\frac{4}{3}\right)$,then the equation of plane is

A. $x+2y+4z=4$

B. $4x+2y+z=4$

C. $x + y + z = 4$

D. $x + 2y + 3z = 8$

Answer: B

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149. IF for a plane the intercepts on the coordinate axes are 8,4,4 then the length of the perpendicular from the origin on to the plane is (A) $\frac{8}{3}$ (B) $\frac{3}{8}$ (C) 3 (D) $\frac{4}{3}$

A. $\frac{8}{3}$

B. $\frac{3}{8}$

C. $\frac{4}{3}$

D. $\frac{3}{4}$

Answer: A

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150. The plane $\frac{x}{2}+\frac{y}{3}+\frac{z}{4}=1$ cuts the co-ordinate axes in A, B, C: then the area of the ΔABC is

A. $\sqrt{29}$ sq. units

B. $\sqrt{41}$ sq.units

C. $\sqrt{51}$sq.units

D. $\sqrt{61}$ sq . Units

Answer: D

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151. The equation of the plane through (-1,1,2), whose normal makes equal acute angles with coordinate axes is

A. $\bar{r}.\left(\hat{i}+\hat{j}+\hat{k}\right)=2$

B. $\bar{r}.\left(\hat{i}+\hat{j}+\hat{k}\right)=6$

C. $\bar{r}.\left(3\hat{i}-3\hat{j}+3\hat{k}\right)=2$

D. $\bar{r}.\left(\hat{i}-\hat{j}+\hat{k}\right)=3$

Answer: A

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152. If the distance of points $2\hat{i}+3\hat{t}j+\lambda\hat{k}$ from the plane $r\cdot\left(3\hat{i}+2\hat{j}+6\hat{k}\right)=13$ is 5 units, then $\lambda=$

A. $6, \frac{-17}{3}$

B. $6, \frac{17}{3}$

C. $-6, \frac{-17}{3}$

D. $-6, \frac{17}{3}$

Answer: A

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153. The distance of the point $(1, 3, -7)$ from the plane passing through the point $(1, -1, -1)$, having normal perpendicular to both the lines $\frac{x-1}{1}=\frac{y+2}{-2}=\frac{z-4}{3} and \frac{x-2}{2}=\frac{y+1}{-1}=\frac{z+7}{-1} is:$ $\frac{5}{\sqrt{83}}$ (2) $\frac{10}{\sqrt{74}}$ (3) $\frac{20}{\sqrt{74}}$ (4) $\frac{10}{\sqrt{83}}$

A. $\frac{10}{\sqrt{74}}$

B. $\frac{20}{\sqrt{74}}$

C. $\frac{10}{\sqrt{83}}$

D. $\frac{5}{\sqrt{83}}$

Answer: C

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154. If the image of the point $P(1, -2, 3)$ in the plane, $2x+3y-4z+22=0$ measured parallel to the line, $\frac{x}{1}-\frac{y}{4}-\frac{z}{5}$ is Q, then PQ is equal to : $\sqrt{42}$ (2) $6\sqrt{5}$ (3) $3\sqrt{5}$ (4) $3\sqrt{42}$

A. $6\sqrt{5}$

B. $3\sqrt{5}$

C. $2\sqrt{42}$

D. $\sqrt{5}$

Answer: C

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