MATHS

BOOKS - MTG WBJEE MATHS (HINGLISH)

THREE DIMENSIONAL GEOMETRY

We Jee Workout Category 1 Single Option Correct Type

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

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

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

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

Answer: C

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2. Find the vector equation of a plane which is at a distance of 4 units from the origin and which has $\left(2\hat{i}-3\hat{j}+6\hat{k}\right)$ as the normal vector.

A. $\vec{r}.\left(2\hat{i}-3\hat{j}+6\hat{k}\right)=28$

B. $\vec{r}.\left(2\hat{i}+3\hat{j}+6\hat{k}\right)=28$

C. $\vec{r}.\left(2\hat{i}-3\hat{j}+6\hat{k}\right)=0$

D. $\vec{r}.\left(2\hat{i}-3\hat{j}+6\hat{k}\right)=-28$

Answer: A

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3. Find the angles made by the line AB with the positive directions of the coordinate axes, if A is $\left(0,\sqrt{3},0\right)$ and B is (0,0,-1).

A. $\frac{\pi}{2},\frac{5\pi}{6},\frac{2\pi}{3}$

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

C. $\frac{\pi}{2}, \frac{5\pi}{6}, \frac{\pi}{3}$

D. $\frac{\pi}{3}, \frac{\pi}{6}, \frac{5\pi}{6}$

Answer: A

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4. Find the value of so that the lines

$$\frac{-(x-1)}{3} = \frac{7(y-2)}{2\lambda} = \frac{z-3}{2} \text{ and } \frac{-7(x-1)}{3\lambda} = \frac{y-5}{1} = \frac{-(z-6)}{5}$$

are perpendicular to each other.

A. $\frac{70}{11}$

B. $\frac{7}{11}$

C. $\frac{17}{11}$

D. $\frac{71}{11}$

Answer: A

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5. If a line drawn from point (1, 2, 1) is perpendicular to the line joining points (1, 4, 6) and (5, 4, 4), then the foot of the perpendicular is

A. (2, 4, 5)

B. (3,4,1)

C. (3,4,5)

D. (3,0,5)

Answer: C

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6. Find the shortest distance between the lines given by

$$\frac{x-8}{3}=\frac{y+9}{-1}=\frac{z-10}{7} \text{ and } \frac{x-1}{3}=\frac{y-2}{8}=\frac{z-5}{-5}$$

A. $\frac{68}{\sqrt{514}}$ units

B. $\frac{86}{\sqrt{541}}$ units

C. $\frac{206}{\sqrt{514}}$ units

D. $\frac{321}{\sqrt{514}}$ units

Answer: C

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7. Find the point of intersection of the lines

$$\frac{x+1}{-3} = \frac{y-3}{2} = \frac{z+2}{1} \text{ and } \frac{x}{1} = \frac{y-7}{-3} = \frac{z+7}{2}$$

A. (-2,1,3)

B. (2,1, -3)

C. (2,3,1)

D. (2,-1,3)

Answer: B

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8. The equation of the plane which is at a distance of 5 units from the origin and whose normal has the d.c.'s $\frac{6}{7}, -\frac{2}{7}, -\frac{3}{7}$ is

A. 6x – 2y – 3z = 35

B. 6x + 2y - 3z = 50

C. 3x – 12y + 4z = 26

D. $2x + y + z = 3\sqrt{11}$

Answer: A

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9. 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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10. Direction cosines of the line passing through A(2,3, -1) and B(-3, 4, 2) are

A. $\frac{-5}{\sqrt{35}}, \frac{1}{\sqrt{35}}, \frac{3}{\sqrt{35}}$

B. $\frac{5}{\sqrt{35}}, \frac{1}{\sqrt{35}}, \frac{4}{\sqrt{35}}$

C. $\frac{-7}{\sqrt{83}}, \frac{3}{\sqrt{83}}, \frac{-5}{\sqrt{83}}$

D. $\frac{-5}{\sqrt{83}}, \frac{-7}{\sqrt{83}}, \frac{-3}{\sqrt{83}}$

Answer: A

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11. The lines $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$ and $\frac{x-1}{-2} = \frac{y-2}{-4} = \frac{z-3}{-6}$ are

A. perpendicular

B. parallel

C. intersecting

D. skew

Answer: B

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12. The shortest distance between the lines x=y+2 = 6z-6 and x + 1 = 2y = -12z is

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

B. 2

C. 1

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

Answer: B

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13. If the lines

x=ay +b, z=cy+d and $x = a'y + b', z = c'y + d'$ are perpendicular, then

A. $\frac{a}{a'} + \frac{c}{c'} = -1$

B. $\frac{a}{a'} + \frac{c}{c'} = 1$

C. ad' + cc' =-1

D. aa' + cc' = 1

Answer: C

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14. 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=1

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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15. The 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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16. Points (3, 2, 4), (4,5,2), (5,8, 0) are

A. collinear

B. vertices of equilateral triangle

C. vertices of isosceles triangle

D. None of these

Answer: A

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17. Find the cartesian equation of the plane whose vector equation is $\vec{r}.\left(3\hat{i}-5\hat{j}+7\hat{k}\right)+8=0$

A. 3x + 5y + 72+8=0

B. 3x - 5y +72-8=0

C. 3x - 5y - 72 +8 = 0

D. 3x - 5y +72+8=0

Answer: D

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18. Find the distance of a point $(2, 4, -1)$ from the line $\frac{x+5}{1}=\frac{y+3}{4}=\frac{z-6}{-9}$.

A. 9 units

B. 6 units

C. 1 unit

D. 7 units

Answer: D

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19. A plane which passes through the point (3, 2, 1) and the line $\frac{x-4}{1}=\frac{y-7}{5}=\frac{z-4}{4}$ is

A. 5x - y= 13

B. x+y+z= 6

C. 5x + y – 2z = 12

D. 5x – y + z = 14

Answer: A

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20. show that the line whose vectors equation is $\vec{r} = \left(2\hat{i} - 2\hat{j} + 3\hat{k}\right) + \lambda\left(\hat{i} - \hat{j} + 4\hat{k}\right)$ is parallel to the plane whose vectors equation is $\vec{r}.\left(\hat{i} + 5\hat{j} + \hat{k}\right) = 5$. Find also the distance between them.

A. $\frac{10}{\sqrt{27}}$ units

B. $\frac{5}{\sqrt{27}}$ units

C. $\frac{4}{\sqrt{27}}$ units

D. $\frac{8}{\sqrt{27}}$ units

Answer: A

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21. Which of the following is true?

A. $\frac{2}{\sqrt{2}}, \frac{-2}{\sqrt{3}}, \frac{-1}{\sqrt{3}}$ are the direction cosines of a directed line.

B. $\frac{-2}{\sqrt{3}}, \frac{-2}{\sqrt{3}}, \frac{-1}{\sqrt{3}}$ are the direction cosines of a directed line.

C. $\frac{2}{\sqrt{3}}, \frac{-2}{\sqrt{3}}, \frac{-1}{\sqrt{3}}$ are not the direction cosines of a directed line.

D. $\frac{1}{\sqrt{3}}, \frac{-1}{\sqrt{3}}, \frac{-1}{\sqrt{3}}$ are not the direction cosines of a directed line.

Answer: C

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22. The vector form of the equation of the line passing through the points (3, 4, -7) and (5, 1 , 6) is

A. $\vec{r} = \left(3\hat{i} + 4\hat{j} - 7\hat{k}\right) + \lambda\left(2\hat{i} - 3\hat{j} + 13\hat{k}\right)$

B. $\vec{r} = \left(3\hat{i} + 4\hat{j} - 7\hat{k}\right) + \lambda\left(8\hat{i} + 5\hat{j} - \hat{k}\right)$

C. $\vec{r} = \left(3\hat{i} + 4\hat{j} - 7\hat{k}\right) + \lambda\left(2\hat{i} - 3\hat{j} - \hat{k}\right)$

D. $\vec{r} = \left(3\hat{i} + 4\hat{j} - 7\hat{k}\right) + \lambda\left(2\hat{i} - 3\hat{j} - 13\hat{k}\right)$

Answer: A

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

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

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

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

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

Answer: C

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24. The points (5, -1,1)(7,4,7), (1, -6, 10) and (-1, -3, 4) are the vertices of a

A. trapezium

B. rhombus

C. rectangle

D. None of these

Answer: D

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25. Let $\vec{a}$, $\vec{b}$ be the position vectors of points A and B with respect to and $\left|\vec{a}\right| = a, \left|\vec{b}\right| = b$. The points Cand D divide AB internally and externally in the ratio 2: 3 respectively. If $\overrightarrow{OC}$ and $\overrightarrow{OD}$ are perpendicular, then

A. $9a^2 = 4b^2$

B. $4a^2 = 9b^2$

C. 9a=4b

D. 4a=9b

Answer: A

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26. The lines joining the points (1, 2, 3), (4, 5, 7) and (-4,3,-6), (2, 9, 2) are

A. coincident

B. parallel

C. intersecting

D. None of these

Answer: B

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27. If $\vec{a} = \hat{i} + 2\hat{k}$, $\vec{b} = \hat{i} + \hat{k}$, $\vec{c} = 7\hat{i} - 3\hat{j} + 4\hat{k}$, then the vector $\vec{d}$ such that $\vec{d} \times \vec{b} = \vec{c} \times \vec{b}$, $\vec{a} . \vec{d} = 0$ is

A. $2\hat{i} - 5\hat{j} + 2\hat{k}$

B. $-2\hat{i} + 4\hat{j} + \hat{k}$

C. $2\hat{i} - 8\hat{j} - \hat{k}$

D. $2\hat{i} - \hat{k}$

Answer: C

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28. Find the vector equation of the plane passing through the points (1, 1, 1), (2, 4, 3) and (5,9,7).

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

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

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

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

Answer: C

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29. If the lines $\frac{x-3}{2}=\frac{y+1}{3}=\frac{z-2}{4}$ and $\frac{x-4}{2}=\frac{y-k}{2}=\frac{z}{1}$ intersect, then find the value of k.

A. $\frac{9}{2}$

B. $\frac{2}{9}$

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

D. $-\frac{5}{6}$

Answer: D

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30. The plane whose vector equation is $\vec{r}.\left(\hat{i}+2\hat{j}-\hat{k}\right)=1$ and the line whose vector equation is $\vec{r}=\left(-\hat{i}+\hat{j}+\hat{k}\right)+\lambda\left(2\hat{i}+\hat{j}+4\hat{k}\right)$ are parallel. Find the distance between them.

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

B. $\frac{1}{\sqrt{6}}$ unit

C. $\frac{3}{\sqrt{6}}$ units

D. $\frac{4}{\sqrt{6}}$ units

Answer: B

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We Jee Workout Category 2 Single Option Correct Type

1. The angle between the lines passing through the points (8, 2, 0), (4, 6, -7) and (-3, 1, 2), (-9, -2, 4) is

A. $\cos^{-1}\left(\frac{2}{63}\right)$

B. $\cos^{-1}\left(\frac{20}{63}\right)$

C. $\frac{\pi}{2}$

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

Answer: A

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

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

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

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

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

Answer: D

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3. Find the angle between the lines $\frac{x-2}{3} = \frac{y-3}{6} = \frac{z-4}{8}$ and $\frac{x+2}{2} = \frac{y+3}{5} = \frac{z+4}{9}$.

A. $\cos^{-1}\left(\frac{108}{\sqrt{11990}}\right)$

B. $\cos^{-1}\left(\frac{99}{\sqrt{9701}}\right)$

C. $\cos^{-1}\left(\frac{9}{\sqrt{9701}}\right)$

D. $\cos^{-1}\left(\frac{10}{\sqrt{9701}}\right)$

Answer: A

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

A. $\cos^{-1}\left(\frac{7}{\sqrt{122}}\right)$

B. $\cos^{-1}\left(\frac{6}{\sqrt{122}}\right)$

C. $\cos^{-1}\left(\frac{8}{\sqrt{122}}\right)$

D. $\cos^{-1}\left(\frac{3}{\sqrt{122}}\right)$

Answer: A

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5. The lines $\vec{r} = \left(\hat{i} + \hat{j}\right) + \lambda\left(\hat{i} + \hat{k}\right)$ and $\vec{r} = \left(\hat{i} + \hat{j}\right) + \mu\left(-\hat{i} + \hat{j} - \hat{k}\right)$ are

A. parallel

B. non-intersecting

C. intersecting

D. None of these

Answer: C

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6. 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 - 132 = 23

B. x + 4y - 132 = 23

C. x - 4y + 132= 23

D. x + 4y + 13z = 23

Answer: D

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7. Show that the lines $\frac{x-a+d}{\alpha-\delta}=\frac{y-a}{\alpha}=\frac{z-a-d}{\alpha+\delta}$ and $\frac{x-b+c}{\beta-\gamma}=\frac{y-b}{\beta}=\frac{z-b-c}{\beta+\gamma}$ are coplanar.

A. coplanar

B. non-coplanar

C. parallel

D. perpendicular

Answer: A

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8. The angle between the lines $\vec{r} = \left(2\hat{i} - 5\hat{j} + \hat{k}\right) + \lambda\left(3\hat{i} + 2\hat{j} + 6\hat{k}\right)$ and $\vec{r} = \left(7\hat{i} - 6\hat{k}\right) + \mu\left(\hat{i} + 2\hat{j}\right.$ is

A. $\cos^{-1}\left(\frac{19}{21}\right)$

B. $\cos^{-1}\left(\frac{1}{21}\right)$

C. $\cos^{-1}\left(\frac{9}{19}\right)$

D. $\cos^{-1}\left(\frac{9}{21}\right)$

Answer: A

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

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

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

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

Answer: B

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10. If 2d is the shortest distance between the lines $x=0, \frac{y}{b}+\frac{z}{c}=1, y=0, \frac{x}{a}-\frac{z}{c}=1$, then

A. $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=\frac{1}{d}$

B. $\frac{1}{a^2}+\frac{1}{b^2}+\frac{1}{c^2}+\frac{1}{d^2}=1$

C. $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}+\frac{1}{d}=1$

D. $\frac{1}{a^2}+\frac{1}{b^2}+\frac{1}{c^2}=\frac{1}{d^2}$

Answer: D

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11. Equation of plane perpendicular to the YZ- plane and passing through $(1, -2, 4)$ and $(3, -4, 5)$ is

A. y + 2z = 5

B. 2y+z=5

C. y + 2z = 6

D. 2y +z = 6

Answer: C

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12. Find the length of perpendicular from the point (1,1,2) to the plane $2x-2y+4z+5=0$.

A. $\frac{13\sqrt{6}}{5}$ units

B. $\frac{13\sqrt{6}}{12}$ units

C. $\frac{5\sqrt{3}}{6}$ units

D. $\frac{13\sqrt{5}}{12}$ units

Answer: B

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13. The vertices of a ΔABC are A(2, 3, 5), B(-1, 3, 2) and C (3,5,-2). The area of ΔABC is

A. $8\sqrt{3}$

B. $6\sqrt{2}$

C. $8\sqrt{2}$

D. $9\sqrt{2}$

Answer: D

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14. The locus of the point which is equidistant from the points (2, -2, 1) and (0, 2, 3) is

A. 2x - y-z=1

B. x - 2y-z=1

C. x - 2y - 2+1 = 0

D. None of these

Answer: C

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15. Find the equation of the line through the point $\hat{i}+\hat{j}-3\hat{k}$ and perpendicular to the lines $\vec{r}=2\hat{i}-3\hat{j}+s\left(2\hat{i}+\hat{j}-3\hat{k}\right)$ and $\vec{r}=3\hat{i}-5\hat{k}+t\left(\hat{i}+\hat{j}+\hat{k}\right)$

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

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

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

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

Answer: D

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We Jee Workout Category 3 One Or More Than One Option Correct Type

1. Find the distance of the point (3, 3, 3) from the plane $\vec{r}.\left(5\hat{i} + 2\hat{j} - 7\hat{k}\right) + 9 = 0.$

A. $\frac{9}{\sqrt{78}}$ units

B. $\frac{5}{\sqrt{78}}$ units

C. $\frac{3}{\sqrt{78}}$ units

D. $\frac{4}{\sqrt{78}}$ units

Answer: A

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2. Show that the straight lines whose direction cosines are given by the equations $al + bm + cn = 0 and \frown 2 + zm^2 = vn^2 + wn^2 = 0$ are parallel or perpendicular as $\frac{a^2}{u} + \frac{b^2}{v} + \frac{c^2}{w} = 0$ or $a^2(v+w) + b^2(w+u) + c^2(u+v) = 0.$

A. $a^2(v+w) + b^2(u+w) + c^2(u+v) = 0$

B. $a^2(v-w) + b^2(u-w) + c^2(u-v) = 0$

C. $u^2(b+c) + v^2(a+c) + w^2(b+a) = 0$

D. None of these

Answer: A

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3. The lines $\frac{x-2}{1} = \frac{y-3}{1} = \frac{z-4}{-k}$ and $\frac{x-1}{k} = \frac{y-4}{2} = \frac{z-5}{1}$ are coplanar, if

A. 0

B. 1

C. -2

D. -3

Answer: A::D

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4. Find the vector equation of the plane passing through the intersection of the planes $\vec{r}.\left(2\hat{i}-7\hat{j}+4\hat{k}\right)=3$ and $\vec{r}.\left(3\hat{i}-5\hat{j}+4\hat{k}\right)+11=0$ and passing through the point (1,0,2).

A. $\vec{r}.\left(15\hat{i}+47\hat{j}+28\hat{k}\right)=7$

B. $\vec{r}.\left(23\hat{i}-119\hat{j}+60\hat{k}\right)=143$

C. $\vec{r}.\left(15\hat{i}-47\hat{j}+28\hat{k}\right)=0$

D. $\vec{r}.\left(52\hat{i}-149\hat{j}+92\hat{k}\right)=0$

Answer: B

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5. Find the shortest distance between the lines given by

$$\frac{x-2}{3}=\frac{y-5}{-2}=\frac{z-1}{1} \text{ and } \frac{x+1}{2}=\frac{y+2}{-6}=\frac{z-3}{1}$$

A. $\sqrt{29}$ units

B. $\frac{33}{\sqrt{213}}$ units

C. $2\sqrt{2}$ units

D. $20\sqrt{33}$ units

Answer: B

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

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

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

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

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

Answer: C

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7. Which of the following points lie on the plane containing the line $\frac{x+1}{-3}=\frac{y-3}{2}=\frac{z+2}{1}$ and the point (0,7, -7)?

A. (0,0,0)

B. (1, 2, -3)

C. (2,-2, 0)

D. (1,2,3)

Answer: A::B::C

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8. Find the equation of the line passing through the point (1, 2, 3) and perpendicular to the lines

$$\frac{x-1}{3}=\frac{y-3}{1}=\frac{z-4}{-5} \text{ and } \frac{x-1}{1}=\frac{y-2}{2}=\frac{z-3}{3}$$

A. $\frac{x-1}{13}=\frac{y-2}{-14}=\frac{z-3}{5}$

B. $\frac{x-1}{3}=\frac{y+5}{-8}=\frac{z-3}{5}$ and $\frac{x-1}{1}=\frac{y-2}{2}=\frac{z-3}{3}$

C. $\frac{x-1}{3}=\frac{y+5}{-8}=\frac{z+2}{5}$

D. $\frac{x-1}{3}=\frac{y-2}{-8}=\frac{z-3}{5}$

Answer: A

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9. The vector equation of a line passing through the point $\hat{i}+2\hat{j}+3\hat{k}$ and perpendicular to the vectors $\hat{i}+\hat{j}+\hat{k}$ and $2\hat{i}-\hat{j}+\hat{k}$ is

A. $\left(\hat{i}+2\hat{j}+3\hat{k}\right)+\lambda\left(-2\hat{i}-5\hat{j}+3\hat{k}\right)$

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

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

D. $\left(\hat{i}+2\hat{j}+3\hat{k}\right)+\lambda\left(2\hat{i}-\hat{j}-2\hat{k}\right)$

Answer: B

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10. Find the distance of the pont $(-1,-5,-10)$ from the point of intersection of the ine $\vec{r}.=2\hat{i}-\hat{j}2\hat{k}\lambda\left(3\hat{i}+4\hat{j}+2\hat{k}\right)$ and the plane $\vec{r}.\left(\hat{i}-\hat{j}+\hat{k}\right)=5.$

A. 9 units

B. 13 units

C. 17 units

D. None of these

Answer: B

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11. The projection of the point (1, 3, 4) in the plane $\vec{r}.\left(2\hat{i}-\hat{j}+\hat{k}\right)=-3$ is

A. (1,3,4)

B. (1, 4,3)

C. (-1,4,3)

D. (-5, 4, 3)

Answer: C

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12. A point Q at a distance 3 from the point $P(1, 1, 1)$ lying on the line joining the points

$A(0, -1, 3)$ and P has the coordinates

A. (2,3, -1)

B. (4,7,-5)

C. (0,-1,3)

D. (-2, -5,7)

Answer: A::C

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13. Find the equations of the two lines through the origin which intersect the line $\frac{x-3}{2} = \frac{y-3}{1} = \frac{z}{1}$ at angle of $\frac{\pi}{3}$ each.

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

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

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

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

Answer: A::B

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14. Find the equations of het planes parallel to the plane $x + 2y - 2z + 8 = 0$ which are at distance of 2 units from the point $(2, 1, 1)$.

A. $x + 2y - 2z + 4 = 0, x + 2y - 2z - 8 = 0$

B. $x - 2y - 2z + 4 = 0, x + 2y - 2z + 8 = 0$

C. $x + 2y + 2z + 4 = 0, x + 2y - 2z - 8 = 0$

D. $x + 2y - 2z + 4 = 0, x + 2y + 2z - 8 = 0$

Answer: A

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15. Which of the following is/are the points that is/are at a distance of 12 units from the point whose position vector is $\left(8\hat{k}+10\hat{j}-8\hat{k}\right)$ on the line which is parallel to $\left(2\hat{i}+\hat{j}+2\hat{k}\right)$?

A. $16\hat{i}+14\hat{j}$

B. $6\hat{j}-16\hat{k}$

C. $\left(16\hat{i}+18\hat{j}-4\hat{k}\right)$

D. None of these

Answer: A::B

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We Jee Previous Years Questions Category 1 Single Option Correct Type

1. The value of λ or which the straighat line $\frac{x-\lambda}{3}=\frac{y-1}{2+\lambda}=\frac{z-3}{-1}$ may lie on the plane $x-2y=0$ (A) 2 (B) 0 (C) $-\frac{1}{2}$ (D) there is no such λ

A. 2

B. 0

C. $1/2$

D. there is no such λ

Answer: C

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2. A straight line joining the points (1, I, 1) and (0, 0, 0) intersects the plane $2x + 2y + z = 10$ at

A. (1,2,5)

B. (2,2,2)

C. (2, 1,5)

D. (1, 1, 6)

Answer: B

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3. Angle between the planes $x + y + 2z = 6$ and $2x - y + z = 9$ is

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

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

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

D. $\frac{\pi}{2}$

Answer: C

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4. The cosine of the angle between any two diagonals of a cube is

A. $\frac{1}{3}$

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

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

D. $\frac{1}{\sqrt{3}}$

Answer: A

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5. The equation of the plane through $(1, 2, -3)$ and $(2, -2, 1)$ and parallel to X-axis is

A. y-z+1 = 0

B. y-z-1=0

C. y + z - 1=0

D. y+z+1=0

Answer: D

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6. Three lines are drawn from the origin O with direction cosines proportional to (1, -1, 1), (2, -3, 0) and (1, 0,3). The three lines are

A. not coplanar

B. coplanar

C. perpendicular to each other

D. coincident

Answer: B

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7. A point P lies on a line through Q(1, -2, 3) and is parallel to the line $\frac{x}{1} = \frac{y}{4} = \frac{z}{5}$. If P lies on the plane 2x + 3y – 4z + 22 = 0, then segment PQ equals to

A. $\sqrt{42}$ units

B. $\sqrt{32}$ units

C. 4 units

D. 5 units

Answer: A

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8. The foot of the perpendicular drawn from the point (1, 8, 4) on the line joining the points (0, -11, 4) and (2, -3, 1) is

A. (4, 5, 2)

B. (4, 5, 2)

C. (4, -5, 2)

D. (4, 5,-2)

Answer: D

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9. The direction ratios of the normal to the plane passing through the points (1, 2, -3), (-1, -2, 1) and parallel to $\frac{x-2}{2} = \frac{y+1}{3} = \frac{z}{4}$ is

A. (2, 3 4)

B. (14, -8, -1)

C. (-2, 0, -3)

D. (1, -2, -3)

Answer: B

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10. The equation of the plane, which bisects the line joining the points (1, 2, 3) and (3, 4, 5) at right angles, is

A. $x + y + z = 0$

B. $x + y - z = 0$

C. $x + y + z = 9$

D. $x + y - z + 9 = 0$

Answer: C

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