MATHS

BOOKS - MODERN PUBLICATION

UNIT TEST-4

Exercise

1. If $\vec{a}$ is a unit vcetor and $\left(\vec{x} - \vec{a}\right) \cdot \left(\vec{x} + \vec{a}\right) = 80$, then find $\left|\vec{x}\right|$.

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2. Find the distance of the points (2,3,4) from the plane $\overrightarrow{R} \cdot \left(3\hat{i} - 6\hat{j} + 2\hat{k} \right) = -11$.

3. If

$P(A) = 0.6, P(B) = 0.7$ and $P(A \cup B) = 0.9$, then find $P\left(\dfrac{A}{B} \right)$ and $P\left(\dfrac{B}{A} \right)$

4. If $\vec{a} = \hat{i} + \hat{j} + \hat{k}$, $\vec{b} = 2\hat{i} - \hat{j} + 3\hat{k}$ and $\vec{c} = \hat{i} - 2\hat{j} + \hat{k}$, find a unit vector parallel to the vector $2\vec{a} - \vec{b} + 3\vec{c}$

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5. Let $\vec{a} = \hat{i} + 4\hat{j} + 2\hat{k}$, $\vec{b} = 3\hat{i} - 2\hat{j} + 7\hat{k}$ and $\vec{c} = 2\hat{i} - \hat{j} + 4\hat{k}$. Find a vector $\vec{d}$, which is perpendicular to both $\vec{a}$ and $\vec{b}$ and $\vec{c} \cdot \vec{d} = 18$.

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6. Find the equation of the perpendicular drawn from the point P(2,4,-1) to the line : $\frac{x+5}{1} = \frac{y+3}{4} = \frac{z-6}{-9}$. Also write down the co ordinates of the foot of the perpendicualr from P to the line.

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7. Find the distance of the point (1,-2,3) from the plane $x - y + z = 5$ measured parallel to the line $\frac{x}{2} = \frac{y}{3} = \frac{z}{-6}$.

8. Minimise $Z = 3x + 2y$ subject to the constraints:

$$x + y \geq 8, 3x + 5y \leq 15, x \geq 0, y \geq 0$$

9. The probabilities of two students A and B coming to the school in time are $\dfrac{3}{7}$ and $\dfrac{5}{7}$ respectively. Assuming that the events, 'A

coming in time' and 'B coming in time' are independent, find the probability of only one of them coming to the school in time. Write at least one advantage of coming to school in time.

10. The sum of the mean and variance of a Binomial distribution of 6 trials is $\dfrac{10}{3}$, find the Binomial distribution.

11. From the point P(1,2,4), a perpendicular is drawn on the plane $2x + y - 2z + 3 = 0$. Find the equations, the length and co-ordinates of the foot of the perpendicular.

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

find the equation of the plane containing the lines.

13. In answering a question in a multiple choice test a student either knows the answer or guesses. Let $\dfrac{3}{4}$ be the probability that he knows the answer and $\dfrac{1}{4}$ be the probability that he guesses. Assuming that a student who guesses at the answer will be correct with probability $\dfrac{1}{4}$. What is the probability that a

student knows the answer, given that he answered it correctly ?

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