CLASS XII
SAMPLE PAPER
MATHS

REVISIONEXAM-1-VEC-3D-PROB

SECTION- A 10x1=10

1.Find the angle between the lines $\frac{x-35}{-2}=\frac{y+55}{1}, z=2; and \frac{x-3}{2}=\frac{y-20}{3}=2z$

2 If $|\vec{a}|=5$; $|\vec{b}|=13$ and $|\vec{a}\times\vec{b}|=25$, find $\vec{a}.\vec{b}$

3. Find the direction cosine of the line which is perpendicular to lines whose direction cosine are proportional to (1,-2,-2) and (0,2,1).

4. *Find a vector parallel to the sum of vectors* $i+2j-3k$ *and* $-i-3j+k$

5. *Find the values of* λ *and p if* $i+pj+\lambda k$ *and* $i-j+8k$ *are parallel*

6. *Find the equation of the line which passes through the points* $(-2,3,4)$ *and* $(3,-1,2)$.

7. If $|\vec{a}|=2$, $|\vec{b}|=7$ $\vec{a}\times\vec{b} = 3\hat{i}+2\hat{j}-6\hat{k}$, find the angle between $\vec{a}$ and $\vec{b}$.

8. Find the distance of the point (-2, 3, 5) form xy and yz planes.

9. Find a unit vector perpendicular to $\vec{a}$ *and* $\vec{b}$ *where* $\vec{a}=i+j+k, \vec{b}=i+2j+3k$

10. Find mean of the probability distribution of the random variable 'no. of tails' when three coins are tossed

SECTION- B 12x4=48

11. Find the shortest distance between the lines whose vector equations are given by
$\vec{r}=(4\hat{i}+4\hat{j}+\hat{k})+\lambda(\hat{i}+\hat{j}+\hat{k})$ and $\vec{r}=(-3\hat{i}-8\hat{j}-3\hat{k})+\mu(2\hat{i}+3\hat{j}+3\hat{k})$

12.A box contains 4 gold and 3 silver coins .Another box contains 3 gold and 5 silver coins . A box is choosen at random and a coin is drawn from it .If the selected coin is a gold coin find the probability that it was drawn from the second box.

13. Find the equation of the plane through the points (3,4,2) and (7,0,6) and is perpendicular to plane 2x-5y=15

14.The probability of A hitting a target is 4/5 and that of B hitting it is 2/3. They both fire at the target .find the probability that (i) At least one of them will hit the target (ii)Only one of them will hit the target.

15 *Find the equation of the line passing through* (1,2,3) *and perpendicular to the lines* $\frac{x-8}{3}=\frac{y+19}{-16}=\frac{z-10}{7}$ *and* $\frac{x-15}{3}=\frac{y-29}{8}=\frac{z-5}{-5}$

16. Find the equation of the plane which contains the line of intersection of the planesx+2y+3z -4=0 and 2x+y-z+5=0 and perpendicular to the plane 5x+3y+6z+8=0.

17.If $\vec{a}$ and $\vec{b}$ are two vectors such that $\vec{a}.\vec{b}=\vec{a}.\vec{c}$, $\vec{a}\times\vec{b}=\vec{a}\times\vec{c}$ and $\vec{a}\neq 0$, then prove that $\vec{b}=\vec{c}$.

18.A die is thrown ten times. If getting a prime number is considered as, success finds the probability of getting (i) at most eight (ii) atleast 8 (iii) exactly 8 successes.

19. Find the equation of the plane containing the line $\frac{x+1}{2}=\frac{y+1}{-1}=\frac{z-3}{4}$ and perpendicular to plane x+2y+z-12=0

20. Find image of the point (0, 2, 3) in the line r= j+2k + λ (i+2j+3k).

21. If $\vec{a}=\vec{i}+4\vec{j}+2\vec{k}$ $\vec{b}=3\vec{i}-2\vec{j}+7\vec{k}$, $\vec{c}=2\vec{i}-\vec{j}+4\vec{k}$ Find a vector $\vec{d}$ which is perpendicular to $\vec{a}$ and $\vec{b}$ and $\vec{c}\bullet\vec{d}=15$

22. Vectors $\vec{a}$, $\vec{b}$,and $\vec{c}$ satisfy the condition $\vec{a}+\vec{b}+\vec{c}=\vec{0}$ .Evaluate $\mu=\vec{a}.\vec{b}+\vec{b}.\vec{c}+\vec{c}.\vec{a}$,if $|\vec{a}|=1$, $|\vec{b}|=4$, $|\vec{c}=2|$

<u>SECTION- C 7x6=42</u>

23. Find the foot of perpendicular from (1, 2, 3) to the line $\frac{x-6}{3}=\frac{y-7}{2}=\frac{z-7}{-2}$ and also the equation of the plane containing the line and the point (1, 2, 3).

24. Prove that the image of the point (3, -2, 1) in the plane 3x – y + 4z = 2 lies on the plane x+y+z+4=0

25. Find the distance of the point (3, 4, 5) from the plane x + y + z = 2 measured parallel to the line 2x = y = z

24. Show that the lines $\frac{x-1}{2}=\frac{y-3}{4}=\frac{-z}{1}$ and $\frac{x-4}{3}=\frac{1-y}{2}=\frac{z-1}{1}$ are coplanar. Also find the equation of the plane containing the lines.

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26. By examining the chest X- rays, the probability that T.B is detected when a person actually suffering is o.99. The probability that the doctor diagnoses incorrectly that a person has T.B on the basis of X-ray is 0.001. In a certain city 1 in 1000 person suffers from T.B. A person is selected at random and is diagnosed to have T.B, what is the chance that he actually has T.B

27. *A manufacturer has three machine operators A, B, and C. The first operator A produces 1% defective items, where as the other two operators B and C produce 5% and 7% defective items respectively. A is on the job for 50% of the time, B is on the job for 30% of the time and C is on the job for 20% of the time. A defective item is produced, what is the probability that it was produced by A?*

28. A line makes angle α, β, γ, ∂ with the four diagonals of a cube Prove that $\cos^2 \alpha + \cos^2 \beta + \cos^2\gamma + \cos^2 \partial = 4/3$.

29. A box contains 12 bulbs of which 3 are defective. If 3 bulbs are drawn from the box at random, find the probability distribution of X, the number of defective bulbs drawn. Hence compute the mean of X.