ST. XAVIER'S SENIOR SECONDARY SCHOOL, DELHI – 110054

Class 12 Time : 1½ hrs.

19-12-2017 Pre-Annual Test in MATHEMATICS M. Marks : 40

GENERAL INSTRUCTIONS:

i) Attempt all the questions.
ii) Section - A consists of 4 questions of 1 mark each.
iii) Section - B consists of 4 questions of 2 marks each.
iv) Section - C consists of 4 questions of 4 marks each.
v) Section - D consists of 2 questions of 6 marks each.

SECTION - A

1. A line makes angles of 45^0 and 60^0 with x and y axis respectively. Find the angle it makes with z axis.

2. Find k if $2\hat{\imath} + 6\hat{\jmath} + 14\hat{k}$ and $\hat{\imath} - \lambda\hat{\jmath} + 7\hat{k}$ are parallel vectors.

3. If f(x) = x + 7 and g(x) = x - 7, x ∈ R find fog(7).

4. If A and B are two events such that P(A) = 0.4, P(B) = 0.8 and P(B/A) = 0.6 find P(A/B).

SECTION - B

5. The odds against A solving a problem are 4:3 and the odds against in favor of B solving it are 7:5. Find the probabilities that the problem is solved if they try independently.

6. Find the vector equation of line passing through the point (2, 4, 6) and parallel to the line 3x + 4 = 4y - 1 = 1 - 4z.

7. Let f(x) is an invertible function, find the inverse of f(x) = $\frac{3x - 2}{5}$.

8. Let $\vec{a} = \hat{\imath} + \hat{\jmath}$ and $\vec{b} = 2\hat{\imath} - 3\hat{k}$. Find a unit vector in the direction of $2\vec{a} + 3\vec{b}$.

SECTION - C

9. Let $\vec{a} = 4\hat{\imath} + 5\hat{\jmath} - \hat{k}$, $\vec{b} = \hat{\imath} - 4\hat{\jmath} + 5\hat{k}$ and $\vec{c} = 3\hat{\imath} + \hat{\jmath} - \hat{k}$. Find a vector $\vec{d}$ such that $\vec{d}$ is perpendicular to $\vec{a}$ and $\vec{b}$ and $\vec{d}.\vec{c} = 21$.

10. Find image of the point (3, 5, 3) in the line $\frac{x}{1} = \frac{y - 1}{2} = \frac{z - 2}{3}$.

11. Two cards are drawn with replacement from a well shuffled deck of 52 cards. Find the probability distribution of number of queens.

12. Let R be the relation on A defined as aRb, if a ≤ b, show that R is reflexive and transitive but not symmetric.

SECTION - D

13. 40% students of a college reside in hostel and the remaining resides outside. At the end of the year 50% of the hostellers got A grade while from outside students only 30% got A grade in examination. At the end of the year, a student of the college was chosen at random and was found to get A grade. What is the probability that the selected student was a hostler?

14. Find the equation of the plane passing through the point(1, 1, -1) and perpendicular to the planes $\vec{r}.(\hat{\imath} + 2\hat{\jmath} + 3\hat{k}) = 7$ and $\vec{r}.(2\hat{\imath} - 3\hat{\jmath} + 4\hat{k}) = 0$.

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