

AMRITA VIDYALAYAM

ANNUAL EXAMINATION 2017 -'18

Class : XI

Marks : 100
Time : 3 hrs

MATHEMATICS

GENERAL INSTRUCTIONS:

1. All questions are compulsory.
2. This question paper consists of 29 questions divided into four sections A, B, C and D.
Section A comprises 4 questions of 1 mark each,
Section B comprises 8 questions of 2 marks each,
Section C comprises 11 questions of 4 marks each and
Section D comprises 6 questions of 6 marks each
3. All questions in section A are to be answered in one word, one sentence or as per the exact requirement of the question.
4. There is no overall choice. However, an internal choice has been provided in 3 questions of four marks each and 3 questions of six marks each. You have to attempt only one of the alternatives in all such questions.
5. Use of calculators is not permitted. You may ask for logarithmic tables, if required.

SECTION - A

1. Find the value of $\sin\left(\frac{-41\pi}{4}\right)$.
2. Find the value of n if ${}^{n+1}P_3 = {}^nP_4$.
3. If the line through the points (-2, 6) and (4, 8) is perpendicular to the line through the points (8, 12) and (x, 24), find the value of x.
4. If A and B are two events such that $P(A) = 0.54$, $P(B) = 0.69$ and $P(A \cap B) = 0.35$, then find $P(A^1 \cap B^1)$.

SECTION - B

5. Let $A = \{1, 2, 3\}$, $B = \{3, 4\}$ and $C = \{4, 5, 6\}$. Find $(A \times B) \cap (A \times C)$.
6. A train is travelling along a circular track of radius 1500 m with a speed of 66 km / h. Find the angle in degrees turned by the train in 10 seconds.
7. Solve the following system of inequalities for real x.
$$\frac{1-2x}{2} \leq \frac{11}{3}, \quad 15-7x > 2x-27$$
8. How many words beginning and ending with a consonant can be formed by using all the letters of the word EQUATION?
9. Find the term independent of x in the expansion of $(2x - \frac{1}{x})^{10}$, $x \neq 0$.
10. Find the area of the triangle formed by the lines joining the vertex of the parabola $x^2 = 12y$ to the ends of its latus-rectum.
11. Find the point on the y - axis which is equidistant from the points (0, 2, 5) and (4, 3, -3).
12. Evaluate.
$$\lim_{x \rightarrow \frac{1}{2}} \frac{8x^3 - 1}{16x^4 - 1}$$

a) face cards?

b) four cards of the same suit?

c) four cards belonging to four different suits?

d) four cards of the same colour?

e) two red cards and two black cards?

28. Find n, if the ratio of the fifth term from the beginning and the fifth term from the end in the expansion of $(\sqrt[4]{2} + \frac{1}{\sqrt[4]{3}})^n$ is $\sqrt{6} : 1$.

OR

If the second, third and fourth terms in the expansion $(x + a)^n$ are 240, 720 and 1080 respectively, find the values of x, a and n.

29. If S be the sum, P the product and R the sum of reciprocals of n terms of a GP, prove that $P^2 R^n = S^n$.