Full Syllabus Practice Paper
Class 11: Mathematics
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MAX. MARKS : 80 **DURATION: 3 HRS**

General Instructions:

1. This Question paper contains - **five sections** A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.
2. **Section A** has 20 **MCQ's** of 1 mark each.
3. **Section B** has 6 **Very Short Answer (VSA)**-type questions of 2 marks each.
4. **Section C** has 5 **Short Answer (SA)**-type questions of 3 marks each.
5. **Section D** has 5 **Long Answer (LA)**-type questions of 5 marks each.
6. **Section E** has 2 **Case Study**-type questions of 4 marks each.

SECTION A (1 mark each)

1. The sum of n terms of the sequence given by $a_n = 5 - 6n, n \in N$ is
   a) $5 - 6n$ b) $2 - 3n$ c) $n(2 - 3n)$ d) None of these
2. The length of the foot of the perpendicular from the point P(3, 4, 5) on Y axis is
   a) 10 b) $\sqrt{34}$ c) $\sqrt{113}$ d) $5\sqrt{2}$
3. Two finite sets have m and n elements. The number of subsets of the first set is 112 more than that of the second set. The values of m and n are respectively
   a) 4, 7 b)7, 4 c)4, 4 d) 7, 7
4. How many 4-digit numbers can be formed using the digits 1 to 9, if repetition of digits is not allowed?
   a) 3024 b) 3026 c) 3040 d) 3014
5. If $(1 - i)^4 = a + ib$, then the value of a and b are respectively
   a) -4, 0 b) 0, -4 c) 4, 0 d) 0, 4
6. The slope of the lines which makes equal intercept with the axis is
   a) 1 b) -1 c) 2 d) 4
7. The point (-4, -3, -5) lies in _____ Octant
   a) I b) VII c) V d) III
8. The nth term of a GP $5, 25, 125, \ldots$ is
   a) 5^n b) 5^{n-1} c) 5^{n+1} d) 5^{n-2}
9. If $\frac{1}{8!} + \frac{1}{9!} = \frac{x}{10!}$, the find the value of x
   a) 90 b) 100 c) 80 d) 95

Solution to Test

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10. Given ordered pair is (2a-5, 4) = (5, b+6). The values of a and b are
    a) -2, 5 b) 2, 5 c) 5, 2 d) 5, -2
11. The income of a person is Rs. 3,00,000, in the first year and he receives an increase of Rs.10,000 to his income per year for the next 19 years. Find the total amount, he received in 20 years.
    a) 7,90,000 b) 85,00,000 c) 8,50,000 d) 79,00,000
12. A card is drawn at random from a well shuffled pack of 52 cards. Find the probability that it is either a king or a spade.
    a) $\frac{19}{51}$ b) $\frac{15}{52}$ c) $\frac{16}{52}$ d) $\frac{17}{52}$
13. Compute the derivative of $f(x) = \sin^2 x$.
    a) $\cos 2x$ b) $2 \sin x$ c) $\sin 2x$ d) $\cos^2 x$
14. Find the derivative of $f(x) = 1 + x + x^2 + x^3 + \ldots + x^{50}$ at $x = 1$.
    a) 1225 b) 1500 c) 1375
    d) 1275
15. Find the radius of the circle $x^2 + y^2 + 8x + 10y - 8 = 0$.
    a) 7 b) 10 c) 15 d)11
16. $\lim_{x \to 0} \frac{x^2 \cos x}{1 - \cos x}$ is
    a) 2 b) $\frac{3}{2}$ c) $\frac{-3}{2}$ d) 1
17. If the first term and common ratio of a GP are 1 and 3 respectively, then find the sum of its third and fifth term.
    a) 70 b) 80 c) 90 d) 100
18. Events E and F are such that P (not E or not F) = 025.
    a) E and F are mutually exclusive events.
    b) E and F are not mutually exclusive events.
    c) E and F are Exhaustive
    d) None of these
19. Suppose A and B are two events such that P(A) = 0.54, P(B)= 0.69 and P(AUB)= 0.88. FindP(A∩B).
    a) 0.35 b) 0.20 c) 0.30 d) None of these
20. Express $50^o 37' 30''$ in radian
    a) $\frac{7\pi}{32}$ b) $\frac{5\pi}{32}$ c) $\frac{9\pi}{32}$ d) $\frac{\pi}{32}$

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SECTION B (2 marks each)

21. A die is loaded on such a way that each odd number is twice as likely to occur as even number. Find P(G), where G is an event that a number greater than 3 occurs on a single roll of the die.
22. If $L = \{1, 2, 3, 4\}, M = \{3, 4, 5, 6\}$ and $N = \{1, 3, 5\}$, then verify that $L - (M \cup N) = (L - M) \cap (L - N)$.
23. Find the derivative of $\frac{\sin x + \cos x}{\sin x - \cos x}$ with respect to x.
24. Find r, if $5P_r^4 = 6P_{r-1}^5$
25. Prove that $\frac{\cos 7x + \cos 5x}{\sin 7x - \sin 5x} = \cot x$
26. (A) Are the points A (3, 6, 9), B (10, 20, 30) and C (25, – 41, 5), the vertices of a right angled triangle?

    OR

    (B) Three vertices of a parallelogram ABCD are A(3, – 1, 2), B (1, 2, – 4) and C (– 1, 1, 2). Find the coordinates of the fourth vertex.

SECTION C (3 marks each)

27. Find the variance of the given data

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	8	15	16	6

28. Find the domain and range of the real function $\sqrt{9 - x^2}$
29. Find the equation of the line passing through the intersection of the lines $3x + y - 9 = 0$ and $4x + 3y - 7 = 0$ and perpendicular to the line $5x - 4y + 1 = 0$.
30. Evaluate $\lim_{x \to 0} \frac{\tan x - \sin x}{x^3}$
31. Insert three numbers between 1 and 256 so that the resulting sequence is a G.P.

SECTION D (5 marks each)

32. (A) In a triangle ABC, prove that $\cos^2 \frac{A}{2} + \cos^2 \frac{B}{2} + \cos^2 \frac{C}{2} = 2\left(1 + \sin \frac{A}{2} \sin \frac{B}{2} \sin \frac{C}{2}\right)$

    OR

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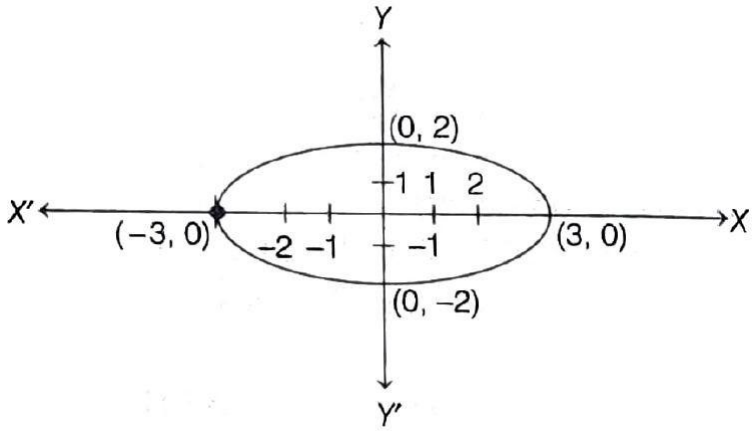
(B) If α, β are the roots of $a\cos\theta + b\sin\theta = c$, show that $\cos(\alpha+\beta) = \frac{a^2-b^2}{a^2+b^2}$

33. How many litres of water will have to be added to 1125 litres of the 45% solution of acid so that the resulting mixture will contain more than 25% by less than 30% acid solution.
34. Find the sum of following series up to n terms: 5+55+555+5555…
35. Find the derivative of $f(x)$ using first principle where $f(x)$ is
    (a) $\sin x + \cos x$
    (b) $x \sin x$
36. Find the mean deviation about the median for the data

Income per day in ₹	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800
Number of persons	4	8	9	10	7	5	4	3

SECTION E (4 marks each)

37. Due to heavy storm an electric wire got bent as shown in figure. It followed a mathematical shape.



Answer the following question below.

i. What is the equation of the shape of the curve?
ii. What is the eccentricity of the curve?
iii. What is the length of latus rectum for the curve?

38. In a class of 60 students. 30 opted for NCC, 32 opted for NSS and 24 opted for both NCC and NSS. If one of these students is selected at random. Find the probability that.
    i. The student has opted only NCC.
    ii. The student opted for NCC and NSS.
    iii. The student opted for neither NCC nor NSS.

Solution to Test

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