



D.A.V. PUBLIC SCHOOL, NEW PANVEL

I UNIT TEST-SAMPLE PAPER

2025-2026

Std:-XI

Sub:-Mathematics

Date :-

Time:- 2Hours

Max. Marks:- 50

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 10 **MCQ's** and **02** Assertion-Reason based questions of 1 mark each.
3. **Section B** has 4 **Very Short Answer** (VSA)-type questions of 2 marks each.
4. **Section C** has 4 **Short Answer** (SA)-type questions of 3 marks each.
5. **Section D** has 2 **Long Answer** (LA)-type questions of 5 marks each.
6. **Section E** has 2 **source based/case based/passage based/integrated units of assessment** (4 marks each) with sub parts.

SECTION – A

This section comprises multiple choice questions (MCQs) of 1 mark each

1. The roster form of the set $A = \{x: x \text{ is the root of the equation } 2x^2 - 16x + 30 = 0\}$ is
(a) {6, 10} (b) {5, 6} (c) {3, 5} (d) {-3, -5}
2. The value of $\frac{2 \cos x \sin x}{2 \sin^2 x - 1}$ is equal to
(a) $-\tan x$ (b) $-\tan 2x$ (c) $-\sin 2x$ (d) $-\cot 2x$
3. Simplified form of $2i^{-10} + 3i^{25}$
(a) $3i - 2$ (b) $-2i - 1$ (c) $i + 2$ (d) none of these
4. If $A = \{1, 2, 3, 4\}$, then number of subsets of A containing the element 3, is
(a) 24 (b) 28 (c) 8 (d) 16
5. If $n(A) = 3$ and $B = \{2, 3, 4, 6, 7, 8\}$ then the number of relations from A to B is
(a) 2^3 (b) 2^9 (c) 2^{12} (d) 2^{18}
6. The domain of the relation $R = \{(x, y) / y = 3x - 3, x \in A\}$ where $A = \{1, 2, 3, 4\}$ is
(a) {1, 2, 3, 4} (b) {0, 3, 6, 9} (c) {0, 1, 2, 3} (d) none of these
7. The degree measure of the angle subtended at the centre of a circle of diameter 50 cm by an arc of length 11 cm is
(a) $20^\circ 15'$ (b) $25^\circ 15'$ (c) $25^\circ 12'$ (d) $28^\circ 12'$
8. Which among the following is not a subset of $\{x, y, 1, 3\}$
(a) $\{x, 1\}$ (b) $\{x, \{1\}\}$ (c) $\{3\}$ (d) $\{1, 3, y\}$
9. Let $A = \{x: x \text{ is a positive integer } < 8 \text{ and } x \text{ is a multiple of 3 or 5}\}$ and $B = \{x: x \text{ is an even number } \leq 7\}$, then $(A - B) \cap B$ is
(a) {2, 4, 6} (b) {3, 5, 6} (c) ϕ (d) {3, 5}

10. If the set $X = \{x: x \text{ is a prime number between } 5 \text{ and } 100\}$, then
 (a) $81 \in X$ (b) $53 \in X$ (c) $46 \in X$ (d) $91 \in X$
 Questions number **11** and **12** are Assertion-Reason based questions. Two statements are given, one labeled Assertion(A) and the other labeled Reason (R). Select the correct answer from the codes (a), (b), (c) and (d) as given below.
 (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
 (b) Both Assertion (A) and Reason (R) are true, but Reason (R) is **not** the correct explanation of the Assertion (A).
 (c) Assertion (A) is true and Reason (R) is false.
 (d) Assertion (A) is false and Reason (R) is true.
11. **Assertion (A):** The domain of sine function is positive real numbers.
Reason (R): The tangent function decreases in the interval $\left[\pi, \frac{3\pi}{2}\right]$
12. **Assertion (A):** The collection of all dangerous animals is a set
Reason (R): Set of all natural numbers is an infinite set

SECTION B

This section comprises of 4 very short answer type-questions (VSA) of 2 marks each

13. If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14\}$, $A = \{1, 5, 10, 12\}$, $B = \{2, 4, 8, 10, 12\}$ and $C = \{3, 4, 5, 10, 11, 14\}$. Find
 i) $A \cup (B \cap C)$ ii) $B \cap (A \cup \bar{C})$.
14. If $f(x) = 4x^3 - 2x + 5$, then find the value of $f(-2) + f\left(\frac{1}{3}\right)$
OR
 Write the domain and range of the following functions: (i) $f(x) = \frac{2}{x+5}$ (ii) $f(x) = |5 - 2x|$
15. Solve $\frac{(i+1)^2}{(1-i)^3}$
16. Prove that $\sin 2x + 2 \sin 4x + \sin 6x = 4 \sin 4x \cos^2 x$

SECTION C

This section comprises of short answer type questions (SA) of 3 marks each

17. Prove that $P(A \cap B) = P(A) \cap P(B)$, for any two sets A and B
18. Write the domain and range of the function $f(x) = 2x^2 - 5$, then
 (i) find $f(-3)$ (ii) find x , if $f(x) = 27$
19. Prove that $\tan \theta = \frac{(\sin \alpha - \cos \alpha)}{\sin \alpha + \cos \alpha}$, then show that $\sin \alpha + \cos \alpha = \sqrt{2} \cos \theta$
20. If $\frac{z-1}{z+1}$ is purely imaginary, then find the value of $|z|$, provided $z \neq -1$

SECTION D

This section comprises 2 of long answer-type questions (LA) of 5 marks each

21. Find the value of $\left(1 + \cos \frac{\pi}{8}\right) \left(1 + \cos \frac{3\pi}{8}\right) \left(1 + \cos \frac{5\pi}{8}\right) \left(1 + \cos \frac{7\pi}{8}\right)$

22. Find domain and range of the real function given by $f(x) = 2 - |1 + x|$, also draw the graph.

SECTION E

This section comprises of 2 case-study/passage-based questions of 4 mark each

23. **Case-Study 1:** Read the following passage and answer the questions given below.

In a class of 60 students, 30 opted for NCC, 32 opted for NSS and 24 opted for both NCC and NSS. One of the student is selected at random. Find the probability that

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|--|---|
| (i) Student opted for NCC or NSS | 1 |
| (ii) Student has opted neither NCC nor NSS | 1 |
| (iii) (a) Student has opted NSS but not NCC. | 2 |

OR

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| (iii) (b) Student has opted exactly one of the options | 2 |
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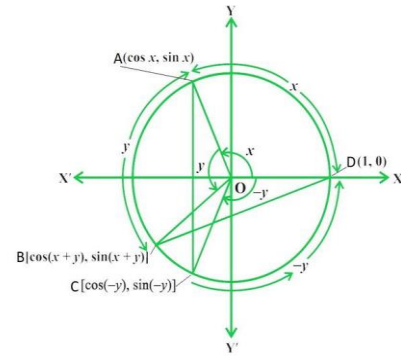
24. **Case Study 2:**

A teacher explains the concept of compound angles, sum and difference of angles to the students with the help of circle from the chapter trigonometric functions. In this case if the angles are taken as $A = 30^\circ$ and $B = 45^\circ$

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| (i) Find the value of $\sin(2A + B)$ | 1 |
| (ii) Find the value of $\tan(A - B)$. | 1 |
| (iii) (a) Find the value of $\sin^2 A - \sin^2 B$ | 2 |

OR

- | | |
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| (iii) (b) Find the value of $\cot(A + B)$. | 2 |
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