D.A.V. PUBLIC SCHOOL, NEW PANVEL

I UNIT TEST-SAMPLE PAPER

2025-2026

Std:-XI

Sub:- Applied Mathematics **Time:- 2Hours**

Max. Marks:- 50

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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.

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SECTION – A

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

1. The value of x if $\log_x 15\sqrt{5} = 2 - \log_x 3\sqrt{5}$

   (a) 1.5 (b) 50 (c) 15 (d) 25

2. Which among the following is not a subset of {x, y, 1, 3}

   (a) $\{x, 1\}$ (b) $\{x, \{1\}\}$ (c) $\{3\}$ (d) $\{1, 3, y\}$

3. The set builder form of set $\{-3, -2, -1, 0, 1, 2\}$

   (a) $A = \{\, x/x \text{ is a whole number less than } 3\}$

   (b) $A = \{\, x/x \text{ is an integer less than } 3\}$

   (c) $A = \{\, x/x \text{ is an integer} - 3 \leq x \leq 3\}$

   (d) $A = \{\, x/x \text{ is an integer} - 3 \leq x < 3\}$

4. Number of relations possible from $A = \{\, x/x \text{ is a whole number less than } 3\}$ to $B = \{x: x \text{ is a root of the equation } x^2 - 7x + 12 = 0\}$

   (a) 6 (b) 12 (c) 32 (d) 64

5. 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) $none\ of\ these$

6. The range of the function defined by $f(x) = 3x + 7$ is equal to

   (a) $(1, \infty)$ (b) $(-\infty, 1)$ (c) $[1, \infty]$ (d) $(-\infty, \infty)$

7. If $x^4\ y^2 z^3 = 49392$,then value of x, y, z in order is

   (a) $5, 3, 4$ (b) $2, 3, 7$ (c) $3, 4, 5$ (d) $none\ of\ these$

8. At what time do the hands of the clock meet between 6:00 and 7:00 is

   (a) $6:45:20$ (b) $6:31:45$ (c) $6:32:10$ (d) $6:32:44$

9. How many odd days are there from 7th October 2020 was Wednesday, then which day fall on 4th August 2023?

   (a) $Wednesday$ (b) $Thursday$ (c) $Friday$ (d) $Monday$

10. A and B together can build a wall in 30 days. If A is twice as good a workman as B, in how many days will A alone finish the work?

    (a) 30 (b) 40 (c) 35 (d) 45

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 collection of all dangerous animals is a set

    Reason (R): Set of all natural numbers is an infinite set .

12. **Assertion (A):** A man covers a distance at 4 km/hr in 3 hour 30 minutes. Then the time taken for him to cover same distance at a speed of 21 km/hr is 40 minutes.

    Reason (R): When distance is a constant, then $S_1T_1 = S_2T_2$.

SECTION B

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

13. Let $U = \{1,2,3,4,5,6,7\}$; $A = \{1,2,3,4\}$;$B = \{3,4,6\}$; $C = \{5,6,7,8\}$. Find $A' \cap (B \cup C)$.

OR

Write the simplest form of the set $(A \cup B \cup C) \cap (A \cap B' \cap C') \cap C'$.

14. Simplify: $7\log\frac{16}{15} + 5\log\frac{25}{24} + 3\log\frac{81}{80}$.

15. A clock gains 4 seconds in 3 minutes and was set right at 9:00 a.m. What time will it show at 11:00 p.m. on the same day?

16. Define a square root function and draw the graph of it .

OR

If $f(x) = \log\frac{1+x}{1-x}$, then evaluate $f\left\{\frac{(x+y)}{1+xy}\right\}$

SECTION C

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

17. For the set $A = \{0, 2, \{1\}, 5\}$, write the subsets of the set .

OR

Draw a Venn diagram to illustrate the information. For any non-empty set A, B and C
(i) $A \cap (B \cup C)$ (ii) $(A \cup B) \cap (A \cup C)$

18. Write the domain and range of the function $f(x) = \sqrt{9 - x^2}$, hence find
(i) $f(-3)$ (ii) $f(1/5)$

19. Find 'n': $\log 7 - \log 2 + \log 16 - 2\log 3 - \log\left(\frac{7}{45}\right) = 1 + \log n$

20. Find the angle between two hands of a clock at 6: 50 ?

OR

A clock loses 5 seconds in 4 minutes was set right at 7:00 a.m. What time will it show at 12: 00pm?

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

21. If $x = (100)^a, y = (10000)^b \text{ and } z = (10)^c$, express $\log\left(\frac{10\sqrt{y}}{x^2 z^3}\right)$ in terms of a, b, c

22. Find the domain and range of the following functions

(i)$f(x) = \frac{2x+1}{x-3}$ (ii) $g(x) = |4 - x|$

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

(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

(iii) (b) Student has opted exactly one of the options 2

24. **Case Study 2:** A can do a work in 10 days and B can do it in 15 days. They worked together for 4 days and then A left the work.
(i) Find one day work of A and B together?
(ii) How much work remains when A left the job?
(iii)(a) In how many days can B finish the remaining work?
(iii) (b)If the remuneration for the work is one thousand rupees, how much amount would each get?

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