PRACTICE PAPER-1

TERM 1

CLASS XI MATHS

Session 2021-22

Time Allowed: 90 minutes Maximum Marks: 40

General Instructions:

1. This question paper contains **three sections – A, B and C**. Each part is compulsory.
2. **Section - A** has 20 MCQs, attempt **any 16 out of 20**.
3. **Section - B** has 20 MCQs, attempt **any 16 out of 20**
4 .**Section - C** has 10 MCQs, attempt **any 8 out of 10**.
5. There is no negative marking.
6. All questions carry equal marks.

SECTION – A

In this section, attempt any 16 questions out of Questions 1 – 20. Each Question is of 1 mark weightage.

1.	LetA={x:x is a multiple of 3} and B={x:x is a multiple of 5}, then A∩B is given by (a){3,6,9.....} (b){5,10,15,.....} (c){15,30,45.....} (d) None of these

2.	The number of the proper subset of {a, b, c} is: (a) 3 (b) 8 (c) 6 (d) 7
3.	Let A and B have 3 and 6 elements respectively. Then the minimum number of elements in AUB equals (a)3 (b)6 (c)9 (d) 18
4.	Which of the following sets is a finite set? (a) $A = \{x : x \in Z \text{ and } x^2 - 5x + 6 = 0\}$ (b) $B = \{x : x \in Z \text{ and } x^2 \text{ is even}\}$ (c) $D = \{x : x \in Z \text{ and } x > -10\}$ (d) All of these

5.	In a group of 500 students, there are 475 students who can speak Hindi and 200 can speak Bengali. What is the number of students who can speak Hindi only ? (a) 275 (b) 300 (c) 325 (d) 350
6.	$1 + i^2 + i^4 + i^6 + \ldots + i^{2n}$ is (a) positive (b) negative (c) 0 (d) cannot be determined
7.	If α, β are roots of the equation $x^2 - 5x + 6 = 0$, then the equation whose roots are $\alpha + 3$ and $\beta + 3$ is (a) $2x^2 - 11x + 30 = 0$ (b) $-x^2 + 11x = 0$ (c) $x^2 - 11x + 30 = 0$ (d) $2x^2 - 5x + 30 = 0$

8.	For a, b, c to be in G.P. What should be the value of $\frac{a-b}{b-c}$? (a) ab (b) bc (c) $\frac{a}{b}$ or $\frac{b}{c}$ (d) None of these
9.	The value of $\lim_{x\to 0} \frac{\sqrt{1+x}+\sqrt{1-x}}{1+x}$ is (a) 2 (b) –2 (c) 1 (d) –1
10.	If $A \times B = \{(5,5),(5,6),(5,7),(8,6),(8,7),(8,5)\}$, then the value A is (a) {5} (b) {8} (c) {5, 8} (d) {5, 6, 7, 8}

11.	Amplitude of $\frac{1+\sqrt{3}i}{\sqrt{3}+1}$ is : (a) $\frac{\pi}{6}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{3}$ (d) $\frac{\pi}{2}$
12.	The real part of $\frac{(1+i)^2}{(3-i)}$ is (a) $\frac{1}{3}$ (b) $\frac{1}{5}$ (c) $-\frac{1}{3}$ (d) None of these
13.	The inclination of the line $x - y + 3 = 0$ with the positive direction of x-axis is (a) 45° (b) 135° (c) –45° (d) –135°

14.	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. (a) 2 (b) 3 (c) 4 (d) 5
15.	A straight line makes an angle of 135° with x-axis and cuts y-axis at a distance of – 5 from the origin. The equation of the line is (a) $2x+y+5=0$ (b) $x+2y+3=0$ (c) $x+y+5=0$ (d) $x+y+3=0$
16.	The lines $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are perpendicular to each other (a) $a_1b_1 - b_1a_2 = 0$ (b) $a_1^2b_2 + b_1^2a_2 = 0$ (c) $a_1b_1 + a_2b_2 = 0$ (d) $a_1a_2 + b_1b_2 = 0$

17.	If A and B are two sets , then AU(A∩B) equals (a)A (b)B (c) Ø (d) None of these
18.	If $f(x)=\begin{cases} x^2+1, & x \geq 1 \\ 3x-1, & x<1 \end{cases}$, then the value of $\lim_{x \to 1} f(x)$ is (a) 2 (b) –2 (c) 1 (d) –1
19.	The Variance of 20 observations is 5 .If each observation is multiplied by 2, then the new variance of resulting observation is (a)5 (b)10 (C)20 (d)None of these
20.	The mean deviation about the median for the data 3,9,5,3,12,10,18,4,7,19,21 is (a)2.57 (b)7.52 (c)5.27 (d) 5.72

SECTION – B

In this section, attempt any 16 questions out of the Questions 21 - 40. Each Question is of 1 mark weightage.

21.	The value of $\lim_{x \to 0} \frac{\cos x}{\pi - x}$ is (a) π (b) $-\pi$ (c) $\frac{1}{\pi}$ (d) $-\frac{1}{\pi}$
22.	The set {x : x is a positive integer less than 6 and $3^x - 1$ is an even number} in roster form is (a) {1, 2, 3, 4, 5} (b) {1, 2, 3, 4, 5, 6} (c) {2, 4, 6} (d) {1, 3, 5}
23.	If $f(x) = x^3 - \frac{1}{x^3}$, then $f(x) + f\left(\frac{1}{x}\right)$ is equal to (a) $2x^3$ (b) $2\frac{1}{x^3}$ (c) 0 (d) 1

24.	The first and eight terms of a G.P. are x^{-4} and x^{52} respectively. If the second term is x^t, then t is equal to: (a) –13 (b) 4 (c) $\frac{5}{2}$ (d) 3
25.	The interval [a, b) is represented on the number line as (a)  (b)  (c)  (d) 
26.	The domain for which the functions $f(x) = 2x^2 - 1$ and $g(x) = 1 - 3x$ is equal, i.e. $f(x) = g(x)$, is (a) $\{0, 2\}$ (b) $\left\{\frac{1}{2}, -2\right\}$ (c) $\left\{-\frac{1}{2}, 2\right\}$ (d) $\left\{\frac{1}{2}, 2\right\}$

27.	The line $(3x - y + 5) + \lambda (2x - 3y - 4) = 0$ will be parallel to y-axis, if λ = (a) $\frac{1}{3}$ (b) $\frac{-1}{3}$ (c) $\frac{3}{2}$ (d) $\frac{-3}{2}$
28.	The roots of equation $x - \frac{2}{x-1} = 1 - \frac{2}{x-1}$ is (a) one (b) two (c) infinite (d) None of these
29.	Let A = {1, 2, 3, 4}, B = {1, 5, 9, 11, 15, 16} and f = {(1, 5), (2, 9), (3, 1), (4, 5), (2, 11)}. Then, (a) f is a relation from A to B (b) f is a function from A to B (c) Both (a) and (b) (d) None of these

30.	If the points (x, y), $(1, 2)$ and $(-3, 4)$ are collinear, then (a) $x+2y-5=0$ (b) $x+y-1=0$ (c) $2x+y-4=0$ (d) $2x-y+10=0$
31.	$\lim_{x\to 0} \frac{2\sin^2 3x}{x^2}$ is equal to : (a) 12 (b) 18 (c) 0 (d) 6
32.	If $(x+iy)^{\frac{1}{3}} = a+ib$, where $x, y, a, b \in R$, then $\frac{x}{a}-\frac{y}{b} =$ (a) a^2-b^2 (b) $-2(a^2+b^2)$ (c) $2(a^2-b^2)$ (d) a^2+b^2

33.	The variance of n observations $x_1, x_2, ..., x_n$ is given by (a) $\sigma^2 = \frac{1}{n}\sum_{i=1}^{n}\left(x_i - \bar{x}\right)$ (b) $\sigma^2 = \frac{1}{n}\sum_{i=1}^{n}\left(x_i - \bar{x}\right)^2$ (c) $\sigma^2 = \frac{1}{n}\sum_{i=1}^{n}\left(x_i + \bar{x}\right)$ (d) $\sigma^2 = \frac{1}{n}\sum_{i=1}^{n}\left(x_i + \bar{x}\right)^2$
34.	If $A = \{1, 2\}, B = \{1, 3\}$, then $(A \times B) \cup (B \times A)$ is equal to (a) $\{(1, 3), (2, 3), (3, 1), (3, 2), (1, 1), (2, 1), (1, 2)\}$ (b) $\{(1, 3), (3, 1), (3, 2), (2, 3)\}$ (c) $\{(1, 3), (2, 3), (3, 1), (3, 2), (1, 1)\}$ (d) None of these
35.	What is the angle between the two straight lines $y = (2 - \sqrt{3})x + 5$ and $y = (2 + \sqrt{3})x - 7$? (a) 60° (b) 45° (c) 30° (d) 15°

36.	The equation of the straight line that passes through the point (3, 4) and perpendicular to the line $3x+2y+5=0$ is (a) $2x+3y+6=0$ (b) $2x-3y-6=0$ (c) $2x-3y+6=0$ (d) $2x+3y-6=0$
37.	The coefficient of variation is computed by: (a) $\frac{\text{mean}}{\text{standard deviation}}$ (b) $\frac{\text{standard deviation}}{\text{mean}}$ (c) $\frac{\text{mean}}{\text{standard deviation}}\times 100$ (d) $\frac{\text{standard deviation}}{\text{mean}}\times 100$
38.	If $z_1 = 2 - i$ and $z_2 = 1 + i$, then value of $\left\lvert \frac{z_1 + z_2 + 1}{z_1 - z_2 + 1} \right\rvert$ is (a) 2 (b) $2i$ (c) $\sqrt{2}$ (d) $\sqrt{2}i$

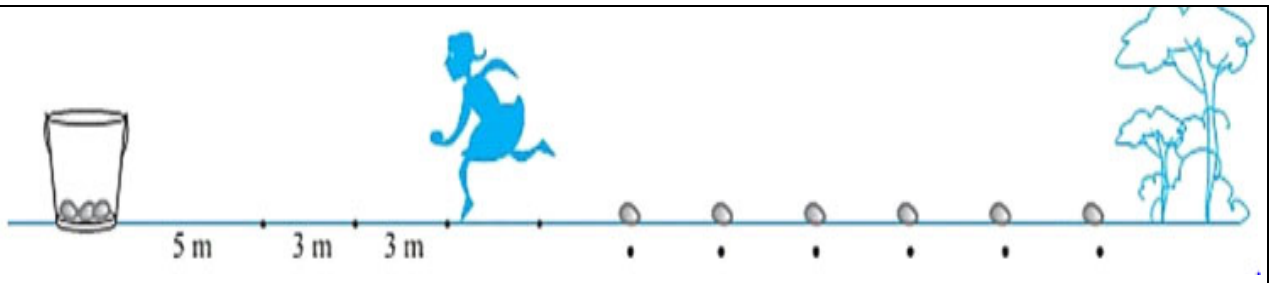
39.	If $\frac{(1+i)^3}{(1-i)^3} - \frac{(1-i)^3}{(1+i)^3} = x + iy$ (a) $x = 0, y = -2$ (b) $x = -2, y = 0$ (c) $x = 1, y = 1$ (d) $x = -1, y = 1$
40.	While dividing each entry in a data by a non-zero number a, the arithmetic mean of the new data: (a) is multiplied by a (b) does not change (c) is divided by a (d) is diminished by a

SECTION – C

In this section from 41-50, attempt any 8 questions.Each question is of 1-mark weightage.Questions 46-50 are based on a Case-Study.

41.	A market research group conducted a survey of 2000 consumers and reported that 1720 consumers like product P_1 and 1450 consumers like product P_2. What is the least number that must have liked both the products? (a) 1150 (b) 2000 (c) 1170 (d) 2500
42.	Domain of $\sqrt{a^2 - x^2}$, $(a > 0)$ is (a) $(-a, a)$ (b) $[-a, a]$ (c) $[0, a]$ (d) $(-a, 0]$
43.	When tested, the lives (in hours) of 5 bulbs were noted as follows 1357, 1090, 1666, 1494, 1623 The mean deviations (in hours) from their mean is (a) 178 (b) 179 (c) 220 (d) 356

44.	Value of $\lim_{x\to 5} \frac{1-\sqrt{x-4}}{x-5}$ is (a) 0 (b) $\frac{1}{2}$ (c) $-\frac{1}{2}$ (d) does not exist
45.	If f and g are real functions defined by $f(x) = x^2 + 7$ and $g(x) = 3x + 5$, then $f\left(\frac{1}{2}\right) \times g(14)$ is (a) $\frac{1336}{5}$ (b) $\frac{1363}{4}$ (c) 1251 (d) 1608
	Case -study based During Sports Day celebration school organized potato race for the students. In this race bucket was placed at the starting point, which was 5 meter from the first potato and other potatoes were placed at 3 m apart in a straight line. There are ten potatoes in the line as shown in figure below

	
	A competitor starts from the bucket, picks up the nearest potato, runs back with it, drops it in the bucket, runs back to pick up the next potato, runs to the bucket to drop it in the bucket and she continues in the same way until all the potatoes are in the bucket. Based upon the information given above answer the following questions.
46.	What is the distance travelled by competitor to pick first potato? (a)10 m (b) 16m (c)22m (d) 48m
47.	What is the distance travelled by competitor to pick second potato? (a)10 m (b) 16m (c) 22m (d) 48m
48.	What is the distance travelled by competitor to pick third potato? (a)10 m (b) 16m (c) 22m (d) 48m
49	The given problem is based on which concept? (a) A.P (b) G.P (c) H.P (d) None of these
50	Find the total distance travelled by competitor? (a)300 m (b) 370 m (c) 730 m (d)700 m