

SAMPLE Question PAPER
Class X Session 2024-25
MATHEMATICS BASIC (Code No.241) – For Visually Impaired

TIME: 3 hours

MAX.MARKS: 80

General Instructions:

Read the following instructions carefully and follow them:

1. This question paper contains 38 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1-18 are multiple choice questions (MCQ's) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Questions no. 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Questions no. 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions no. 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Questions no. 36-38 are case study based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice in 2 questions of section A, 2 Questions of section B and 2 Questions of section C has been provided. An internal choice has been provided in the all 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take $\pi = 22/7$ wherever required if not stated.
11. Use of calculators is not allowed.

Section A		
Section A consists of 20 questions of 1 mark each.		
1.	HCF OF $(3^3 \times 5^2 \times 2)$, $(3^2 \times 5^3 \times 2^2)$ and $(3^4 \times 5 \times 2^3)$ is (A) 450 (B) 90 (C) 180 (D) 630	1
2.	If pair of linear equations is consistent, then the lines representing them are (A) parallel (B) only coincident (C) either intersecting or coincident (D) only intersecting	1
3.	The value of k for which the quadratic equation $kx^2 - 5x + 1 = 0$ does not have a real solution, is (A) 0 (B) $\frac{25}{4}$ (C) $\frac{4}{25}$ (D) 7	1
4.	The distance between the points (a, b) and $(-a, -b)$ is (A) $\sqrt{a^2 + b^2}$ (B) $a^2 + b^2$ (C) $2\sqrt{a^2 + b^2}$ (D) $4\sqrt{a^2 + b^2}$	1

5.	If the angle between the two tangents drawn from an external point to a circle is 35° , then the angle subtended by the line-segment joining the points of contact at the centre of the circle will be (A) 145° (B) 90° (C) 180° (D) 360°	1
6.	If $\triangle ABC \sim \triangle PQR$ such that $3AB = 2PQ$ and $BC=10\text{cm}$ then length QR is equal to (A) 10 cm (B) 15 cm (C) $\frac{20}{3}$ cm (D) 30 cm	1
7.	If $3 \cot A = 4$, where $0^\circ < A < 90^\circ$, then $\sec A$ is equal to (A) $\frac{5}{4}$ (B) $\frac{4}{3}$ (C) $\frac{5}{3}$ (D) $\frac{3}{4}$	1
8.	In $\triangle ABC$ & $\triangle DEF$, $\angle B = \angle E$, $\angle F = \angle C$ and $AB = 3DE$ then the two triangles are (A) congruent but not similar (B) similar but not congruent (C) neither congruent nor similar (D) congruent as well as similar	1
9.	If $\text{H.C.F}(420, 189) = 21$ then $\text{L.C.M}(420, 189)$ is (A) 420 (B) 1890 (C) 3780 (D) 3680	1
10.	The 4 th term from the end of the A.P. $-8, -5, -2, \dots, 49$ is (A) 37 (B) 40 (C) 1 (D) 43	1
11.	If $\triangle ABC \sim \triangle DFE$ and $\frac{AB}{DE} = \frac{2}{3}$, then the ratio of their corresponding altitudes drawn from A and D to their opposite sides is (A) $\frac{3}{2}$ (B) $\frac{4}{9}$ (C) $\frac{1}{3}$ (D) $\frac{2}{3}$	1
12.	A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that $OQ = 12$ cm. Length PQ is (A) 12 cm (B) 13 cm (C) 8.5 cm (D) $\sqrt{119}$ cm	1
13.	$\frac{1 - \tan^2 30^\circ}{1 + \tan^2 30^\circ}$ is equal to (A) $\cos 60^\circ$ (B) $\sin 60^\circ$ (C) 1 (D) $\tan^2 60^\circ$	1
14.	The total surface area of solid hemisphere of radius r is (A) πr^2 (B) $2\pi r^2$ (C) $3\pi r^2$ (D) $4\pi r^2$	1
15.	Which of the following cannot be the probability of an event? (A) 0.4 (B) 4% (C) 0.04% (D) 4	1

16.	The roots of quadratic equation $3x^2 - 4\sqrt{3}x + 4 = 0$ are (A) not real (B) real and equal (C) rational and distinct (D) irrational and distinct	1														
17.	The following distribution shows the marks distribution of 80 students. <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Marks</th> <th>Below 10</th> <th>Below 20</th> <th>Below 30</th> <th>Below 40</th> <th>Below 50</th> <th>Below 60</th> </tr> </thead> <tbody> <tr> <td>No. of students</td> <td>2</td> <td>12</td> <td>28</td> <td>56</td> <td>76</td> <td>80</td> </tr> </tbody> </table> <p>The median class is (A) 20-30 (B) 40-50 (C) 30-40 (D) 10-20</p>	Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60	No. of students	2	12	28	56	76	80	1
Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60										
No. of students	2	12	28	56	76	80										
18.	A quadratic polynomial whose zeroes are $\frac{2}{5}$ and $-\frac{1}{5}$ is (A) $25x^2 + 5x - 2$ (B) $5x^2 - 2x + 1$ (C) $5x^2 + 2x - 1$ (D) $25x^2 - 5x - 2$	1														
	DIRECTION: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R) . Choose the correct option A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) B) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) C) Assertion (A) is true but reason (R) is false. D) Assertion (A) is false but reason (R) is true.															
19.	Assertion(A): The sequence $-1, -1 - 1, \dots, -1$ is an AP. Reason(R): In an AP, $a_n - a_{n-1}$ is constant where $n \geq 2$ and $n \in N$	1														
20.	Assertion(A): $(2 + \sqrt{3})\sqrt{3}$ is an irrational number. Reason(R): Product of two irrational numbers is always irrational.	1														
	Section B															
	Section B consists of 5 questions of 2 marks each.															
21(A).	$P(x, y)$ is a point equidistant from the points $A(4,3)$ and $B(3,4)$. Prove that $x - y = 0$.	2														
	OR															
21(B).	Show that the points $(-4, -1), (-2, -4), (4, 0)$ and $(2, 3)$ are the vertices of a parallelogram.	2														

22.	In two concentric circles, a chord of length 8 cm of the larger circle touches the smaller circle. If the radius of the larger circle is 5 cm, then find the radius of the smaller circle.	2														
23(A).	The sum of the first 12 terms of an A.P. is 900. If its first term is 20 then find the common difference and 12 th term.	2														
OR																
23(B).	The sum of first n terms of an A.P. is represented by $S_n = 6n - n^2$. Find the common difference.	2														
24.	If $\sin(A - B) = \frac{1}{2}$ and $\cos(A + B) = \frac{1}{2}$, $0^\circ < A + B < 90^\circ$ and $A > B$, then find the values of A and B .	2														
25.	Calculate mode of the following distribution:	2														
<table border="1" style="width: 100%; text-align: center;"> <tbody> <tr> <td>Class</td> <td>5-10</td> <td>10-15</td> <td>15-20</td> <td>20-25</td> <td>25-30</td> <td>30-35</td> </tr> <tr> <td>Frequency</td> <td>5</td> <td>6</td> <td>15</td> <td>10</td> <td>5</td> <td>4</td> </tr> </tbody> </table>			Class	5-10	10-15	15-20	20-25	25-30	30-35	Frequency	5	6	15	10	5	4
Class	5-10	10-15	15-20	20-25	25-30	30-35										
Frequency	5	6	15	10	5	4										
Section C																
Section C consists of 6 questions of 3 marks each.																
26.	Prove that $\sqrt{5}$ is an irrational number.	3														
27. (A)	Find the ratio in which the y-axis divides the line segment joining the points (4, -5) and (-1, 2). Also find the point of intersection.	3														
OR																
27(B).	Find the ratio in which the line $4x + y = 4$ divides the line segment joining the points (-2, -1) and (3, 5).	3														
28.	Prove that: $(\operatorname{cosec}A - \sin A)(\sec A - \cos A) = \frac{1}{\tan A + \cot A}$.	3														
29.	Find the mean using the step deviation method.	3														
<table border="1" style="width: 100%; text-align: center;"> <tbody> <tr> <td>Class</td> <td>0-10</td> <td>10-20</td> <td>20-30</td> <td>30-40</td> <td>40-50</td> </tr> <tr> <td>Frequency</td> <td>6</td> <td>10</td> <td>15</td> <td>9</td> <td>10</td> </tr> </tbody> </table>			Class	0-10	10-20	20-30	30-40	40-50	Frequency	6	10	15	9	10		
Class	0-10	10-20	20-30	30-40	40-50											
Frequency	6	10	15	9	10											

30. (A)	From an external point P, two tangents PA and PB are drawn to a circle with centre O. At a point E on the circle, a tangent is drawn to intersect PA and PB at C and D, respectively. If PA = 10cm find the perimeter of ΔPCD .	3
OR		
30(B).	Prove that the lengths of tangents drawn from an external point to a circle are equal.	3
31.	The sum of a two-digit number and the number obtained by reversing the order of its digits is 99. If ten's digit is 3 more than the unit's digit, then find the number.	3
Section -D		
Section D consists of 4 questions of 5 marks each		
32 (A).	Amita buys some books for ₹1920. If she had bought 4 more books for the same amount each book would cost her ₹ 24 less, how many books did she buy? What was the initial price of one book?	5
OR		
32 (B).	A train travels at a certain average speed for a distance of 132 km and then travels a distance of 140 km at an average speed of 4 km/h more than the initial speed. If it takes 4 hours to complete the whole journey, what was the initial average speed? Determine the time taken by train to cover the distances separately.	5
33.	If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then prove that the other two sides are divided in the same ratio.	5
34.	The perimeter of a sector of a circle of radius 6.3 cm is 25.8 cm, find the area of the sector.	5
35 (A).	From the top of a 9 m high building, the angle of elevation of the top of a cable tower is 60° and angle of depression of its foot is 45° . Determine the height of the tower and distance between building and tower. (Use $\sqrt{3} = 1.732$)	5
OR		
35 (B).	As observed from the top of a 75 m high lighthouse from the sea level, the angles of depression of two ships are 30° and 45° . If one ship is exactly behind the other on the same side of the lighthouse, find the distance between the two ships (Use $\sqrt{3} = 1.732$)	5
Section E		
36.	<p>A group of students conducted a survey to find out about the preferred mode of transportation to school among their classmates. They surveyed 200 students from their school. The results of the survey are as follows:</p> <p>120 students preferred to walk to school. 25% of the students preferred to use bicycles.</p>	

	<p>10% of the students preferred to take the bus. Remaining students preferred to be dropped off by car.</p> <p>Based on the above information, answer the following questions:</p>	
(i)	What is the probability that a randomly selected student does not prefer to walk to school?	1
(ii)	Find the probability of a randomly selected student who prefers to walk or use a bicycle.	1
(iii)(A)	One day 50% of walking students decided to come by bicycle. What is the probability that a randomly selected student comes to school using a bicycle on that day?	2
	OR	
(B)	What is the probability that a randomly selected student prefers to be dropped off by car?	2
37.	<p>Shibi decorated the door of his house with garlands on the occasion of Onam Each garland forms the shape of a parabola.</p> <p>Based on the above information answer the following questions:</p>	
(i)	Suppose the quadratic polynomial for the given curve is $ax^2 + bx + c$, then what will be the sign of a ?	1
(ii)	Find a quadratic polynomial with the sum and product of its zeroes as -1 and -2 respectively.	1
(iii)(A)	For what value of ' k ', -1 is one of the zeroes of the quadratic polynomial $(k - 2)x^2 - 2x - 5$	2
	OR	
(B)	If α & β are the zeroes of the polynomial $f(x) = x^2 - 7x + 12$, then find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$	2
38.	<p>A toy rocket is in the form of a right circular cylinder closed at the lower end and surmounted by cone with same radius as that of cylinder. The height & diameter of the cylindrical part is 12 cm & 6 cm, respectively. Given slant height of the conical part is 5 cm ($\pi = 3.14$)</p> <p>Based on the above information answer the following questions:</p>	
(i)	Find the height of the cone.	1
(ii)	Find curved surface area of the cylindrical part.	1
(iii)(A)	Determine the total surface area of the toy	2
	OR	
(B)	Determine the volume of the toy.	2