

**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.

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

|     |                                                                                                                                                                                                                                                                                 |   |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 5.  | If the angle between the two tangents drawn from an external point to a circle is $35^\circ$ , then the angle subtended by the line-segment joining the points of contact at the centre of the circle will be<br>(A) $145^\circ$ (B) $90^\circ$ (C) $180^\circ$ (D) $360^\circ$ | 1 |
| 6.  | If $\triangle ABC \sim \triangle PQR$ such that $3AB = 2PQ$ and $BC = 10\text{cm}$ then length QR is equal to<br>(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<br>(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<br>(A) congruent but not similar (B) similar but not congruent<br>(C) neither congruent nor similar (D) congruent as well as similar             | 1 |
| 9.  | If H.C.F(420,189) = 21 then L.C.M(420,189) is<br>(A) 420 (B) 1890 (C) 3780 (D) 3680                                                                                                                                                                                             | 1 |
| 10. | The 4 <sup>th</sup> term from the end of the A.P. $-8, -5, -2, \dots, 49$ is<br>(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<br>(A) $\frac{3}{2}$ (B) $\frac{4}{9}$<br>(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<br>(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<br>(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<br>(A) $\pi r^2$ (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?<br>(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<br>(A) not real    (B) real and equal    (C) rational and distinct    (D) irrational and distinct                                                                                                                                                                                                                                                                                                                                                       | 1        |          |          |          |          |          |          |                 |   |    |    |    |    |    |   |
| 17.             | <p>The following distribution shows the marks distribution of 80 students.</p> <table border="1"><tr><td>Marks</td><td>Below 10</td><td>Below 20</td><td>Below 30</td><td>Below 40</td><td>Below 50</td><td>Below 60</td></tr><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></table> <p>The median class is<br/>(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<br>(A) $25x^2 + 5x - 2$ (B) $5x^2 - 2x + 1$<br>(C) $5x^2 + 2x - 1$ (D) $25x^2 - 5x - 2$                                                                                                                                                                                                                                                                                                                                                     | 1        |          |          |          |          |          |          |                 |   |    |    |    |    |    |   |
|                 | <p><b>DIRECTION:</b> In the question number 19 and 20, a statement of <b>Assertion (A)</b> is followed by a statement of <b>Reason (R)</b>.<br/>Choose the correct option<br/>A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)<br/>B) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)<br/>C) Assertion (A) is true but reason (R) is false.<br/>D) Assertion (A) is false but reason (R) is true.</p> |          |          |          |          |          |          |          |                 |   |    |    |    |    |    |   |
| 19.             | Assertion(A): The sequence $-1, -1 - 1, \dots, -1$ is an AP.<br>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.<br>Reason(R): Product of two irrational numbers is always irrational.                                                                                                                                                                                                                                                                                                                                                                                   | 1        |          |          |          |          |          |          |                 |   |    |    |    |    |    |   |
|                 | <b>Section B</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |          |          |          |          |          |          |                 |   |    |    |    |    |    |   |
|                 | <b>Section B consists of 5 questions of 2 marks each.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |          |          |          |          |          |          |                 |   |    |    |    |    |    |   |
| 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        |          |          |          |          |          |          |                 |   |    |    |    |    |    |   |
|                 | <b>OR</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |          |          |          |          |          |          |                 |   |    |    |    |    |    |   |
| 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 <sup>th</sup> 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:<br><table border="1"><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></table> | Class | 5-10  | 10-15 | 15-20 | 20-25 | 25-30 | 30-35     | Frequency | 5  | 6  | 15 | 10 | 5 | 4 | 2 |
| 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.<br><table border="1"><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></table>                       | Class | 0-10  | 10-20 | 20-30 | 30-40 | 40-50 | Frequency | 6         | 10 | 15 | 9  | 10 | 3 |   |   |
| 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 $\triangle PCD$ .                                                                                         | 3 |
|         | <b>OR</b>                                                                                                                                                                                                                                                                                                                          |   |
| 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 |
|         | <b>Section -D</b>                                                                                                                                                                                                                                                                                                                  |   |
|         | <b>Section D consists of 4 questions of 5 marks each</b>                                                                                                                                                                                                                                                                           |   |
| 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 |
|         | <b>OR</b>                                                                                                                                                                                                                                                                                                                          |   |
| 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 $60^\circ$ and angle of depression of its foot is $45^\circ$ . Determine the height of the tower and distance between building and tower. (Use $\sqrt{3} = 1.732$ )                                                                     | 5 |
|         | <b>OR</b>                                                                                                                                                                                                                                                                                                                          |   |
| 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 $30^\circ$ and $45^\circ$ . 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 |
|         | <b>Section E</b>                                                                                                                                                                                                                                                                                                                   |   |
| 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.<br/>25% of the students preferred to use bicycles.</p> |   |

|          |                                                                                                                                                                                                                                                                                                                                                                                          |   |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|          | <p>10% of the students preferred to take the bus.<br/>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 |
|          | <b>OR</b>                                                                                                                                                                                                                                                                                                                                                                                |   |
| (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 |
|          | <b>OR</b>                                                                                                                                                                                                                                                                                                                                                                                |   |
| (B)      | If $\alpha$ & $\beta$ 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 &amp; diameter of the cylindrical part is 12 cm &amp; 6 cm, respectively. Given slant height of the conical part is 5 cm (<math>\pi = 3.14</math>)</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 |
|          | <b>OR</b>                                                                                                                                                                                                                                                                                                                                                                                |   |
| (B)      | Determine the volume of the toy.                                                                                                                                                                                                                                                                                                                                                         | 2 |