Choice. Each question carries 5 marks.

No. 29 and 30 both have been provided with internal 3 marks each. Sections E consists of two questions C, D and E have been provided with internal choice, 4 questions from Q. No. 25 to 26 question No. 27 and 4 questions from Q. No. 21 to 24. Section No. 23 and 24 have been divided into two, Sections E consists of 4 questions and each carries two marks. Illass Questions and each carries two marks. Illass Questions and each carries two marks.

Sections A consists of 2 multiple-choice questions based on two case studies and each carries 1 mark each. Sections B consists of 8 multiple-choice question and each carries 1 mark each. Sections C divided into 5 Sections A, B, C, D, E.

Note:

Time: 3 Hrs

Mathematics

Class - X

Model Test Paper (Term - II)
1. \[ \tan \theta = \frac{\cos \theta}{\tan \theta} \]
2. \[ \cos \theta = \sqrt{1 - \sin^2 \theta} \]
3. \[ \frac{1}{\sin \theta} = \csc \theta \]
4. \[ \frac{1}{\cos \theta} = \sec \theta \]
5. \[ \tan \theta = \frac{\sec \theta}{\cos \theta} \]

3. The volume of a cube having side length \( a \) is \( a^3 \).

4. How many tangents can a circle have?

(a) 1
(b) 2
(c) 3
(d) 4

5. The tangent at a point on a circle is perpendicular to the radius through the point of contact.

(a) True
(b) False

6. \[ \sqrt{a^2 + b^2} = \sqrt{c^2 + d^2} \]

7. \[ \sin (\theta - 90^\circ) = \cos \theta \]
8. \[ \cos (\theta + 90^\circ) = -\sin \theta \]

All questions carry one mark each. 1x12=12

Section-A (20 marks)

Mathematics

Class - X

Model Test Paper (Term - II)

Time: 3 hrs

M.M.: 50
Section - B (Note - B)

2. (q) \sin \theta = \frac{r}{h} = \frac{1}{2}

\sin \theta = \frac{\sqrt{3}}{2}

\cos \theta = \frac{1}{2}

\tan \theta = \sqrt{3}

3. \pi \sqrt{h^2 - r^2}

4. \frac{7}{96} \pi \text{ cm}^3

5. \frac{7}{92} \pi \text{ cm}^3

6. Volume of a cylinder

7. \frac{7}{96} \pi \text{ cm}^3

8. The common point of the tangent and the circle is called the point of contact.

9. \frac{7}{92} \pi \text{ cm}^3

10. \frac{7}{91} \pi \text{ cm}^3

11. \frac{7}{91} \pi \text{ cm}^3
13. Find the probability that the number on the card is an odd number or even number etc.

14. Find the probability that the number on the card is a prime number.

\[ \frac{7}{18} \]

15. Find the probability that the number on the card is divisible by 5 or 3 both.

\[ \frac{1}{4} \]
[\( \frac{1}{3} \) (c) \( \frac{1}{6} \) (a)]

16. The probability that the number on the card is divisible by 17 or 7 is 1. Find the probability that the number on the card is divisible by 17 or 7.

\[ \frac{1}{7} \]

---

Case Study 1:
21. If $\sin a = \frac{3}{4}$ then find $\cos a$ and $\tan a$.

All questions carry 2 marks.

Section - C (20, 30, C)

(c) 58.7 m
(b) 58.875 m
(a) 58.9 m

20. Find the increase in the grazing area if the rope were 10 m long instead of 5 m.

20. (c) 1.930 m²
(b) 1.928 m²
(a) 1.925 m²

19. Find the area of the part of the field in which horse can graze.

19. (c) $\frac{360}{\theta}$ m²
(b) $\frac{180}{\theta}$ m²
(a) $\frac{360}{\theta}$ m²

18. Choose the correct formula of determining the area of a sector of circle.

18. (c) $\frac{227}{\theta}$ m²
(b) $\frac{225}{\theta}$ m²
(a) $\frac{222}{\theta}$ m²

17. Find the area of the field.

17. (c) 8
(b) 7
(a) 6
27. Find the area of a shaded region where \( \triangle ABC \) is a square of side 14 cm.

\[
\text{Area} = \frac{1 - \cos A}{\sin A} \cdot \sec A
\]

Prove that:

\[
\frac{1 - \cos A}{\sin A} = \frac{\sec A}{\sec A + \cos A}
\]

28. If \( A < B \) in \( \triangle ABC \), then:

\[
\sin (A-B) = \frac{2}{1} \cdot \cos (A-B) = \frac{2}{1} \cdot 0 = 0
\]

29. If \( A < B \) and \( A + B > 90^\circ \), then:

\[
\sin (A-B) = \frac{2}{1} \cdot \cos (A-B) = \frac{2}{1} \cdot 0 = 0
\]

32. If tangents \( PA \) and \( PB \) from point \( P \) to a circle with the ball drawn is red at random from the bag. What is the probability that the ball drawn is red and 5 black balls. A ball is drawn at random from the bag. Construct the part of tangents to the circle and measure their length.
Mathematical spheres of radius 6 cm, 8 cm, and 10 cm are melted to form a single solid sphere. Find the radius of the resulting sphere.

<table>
<thead>
<tr>
<th>No. of Families</th>
<th>1</th>
<th>2</th>
<th>6</th>
<th>7</th>
<th>7-9</th>
<th>10-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of families in each</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Find the mode of this data.

<table>
<thead>
<tr>
<th>No. of families</th>
<th>1</th>
<th>2</th>
<th>6</th>
<th>7</th>
<th>7-9</th>
<th>10-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family size</td>
<td>1-3</td>
<td>3-5</td>
<td>5-7</td>
<td>7-9</td>
<td>10-11</td>
<td></td>
</tr>
</tbody>
</table>

A child has a dice whose faces show the letters as given below.

\[ \text{A} \quad \text{B} \quad \text{C} \quad \text{D} \quad \text{E} \quad \text{F} \]

A survey conducted on 20 households in a locality by a group of students resulted in the following frequency distribution of number of family members in a household.

<table>
<thead>
<tr>
<th>No. of families</th>
<th>1</th>
<th>2</th>
<th>6</th>
<th>7</th>
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<td></td>
</tr>
</tbody>
</table>

Find the curved surface area of this prism.

The curved surface area of a frustum of a cone is 4 cm and diameter of the bases are 10 cm and 6 cm. Find the slant height of the cone.