

CLASS X : SAMPLE QUESTION PAPER - 1 SUBJECT : MATHS - STANDARD (041)

Time Allowed: 3 Hours

Maximum Marks: 80

General Instructions:

Read the following instructions carefully and follow them:

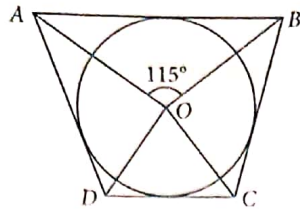
1. This question paper contains 38 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Questions no. 21-25 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 Question of Section B, 2 Questions of Section C and 2 Questions of Section D has been provided. An internal choice has been provided in all the 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

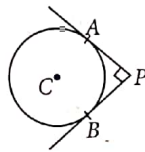
(Section A consists of 20 questions of 1 mark each)

1. If 1 is a zero of the polynomials $ay^2 + ay + 3$ and $y^2 + y + b$, then find the value of ab .
(a) 0 (b) 1 (c) 2 (d) 3
2. The pair of linear equations $x + 2y - 8 = 0$ and $2x + 4y = 16$ has
(a) unique solution (b) infinite solutions
(c) no solution (d) finitely many solutions
3. A chord of a circle of radius 10 cm subtends a right angle at its centre. The length of the chord (in cm) is
(a) $5\sqrt{2}$ (b) $10\sqrt{2}$ (c) $\frac{5}{\sqrt{2}}$ (d) $10\sqrt{3}$
4. The common difference of the A.P. $\frac{1}{3q}, \frac{1-6q}{3q}, \frac{1-12q}{3q}, \dots$ is
(a) q (b) $-q$ (c) -2 (d) 2
5. The curved surface area of a cylinder is 264 m^2 and its volume is 924 m^3 . The height of the cylinder is
(a) 3 m (b) 4 m (c) 6 m (d) 8 m
6. If $4 \tan \theta = 3$, then $\left(\frac{4 \sin \theta - \cos \theta}{4 \sin \theta + \cos \theta} \right)$ is equal to
(a) $\frac{2}{3}$ (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) $\frac{3}{4}$

7. In the given figure, the quadrilateral $ABCD$ is circumscribed to a circle with centre O . If $\angle AOB = 115^\circ$, then $\angle COD =$



- (a) 80° (b) 70° (c) 60° (d) 65°
8. If α and β are the zeroes of the quadratic polynomial $f(t) = t^2 - 6t + 5$, then the value of $\alpha^4\beta^3 + \alpha^3\beta^4$ is
 (a) 745 (b) 750 (c) 700 (d) 800
9. Mode is
 (a) least frequent value (b) middle most value
 (c) most frequent value (d) None of these
10. In the given figure, PA and PB are two tangents drawn from an external point P to a circle with centre C and radius 4 cm. If $PA \perp PB$, then the length of each tangent is



- (a) 3 cm (b) 4 cm (c) 5 cm (d) 6 cm
11. The nature of roots of the quadratic equation $6x^2 - x - 2 = 0$ is
 (a) real and equal (b) real and unequal
 (c) not real (d) can't be determined
12. Evaluate : $\sin^2 30^\circ + \cos^2 45^\circ + 4 \cot^2 60^\circ - 2 \sin^2 90^\circ$
 (a) 0 (b) $\frac{1}{12}$ (c) $\frac{5}{12}$ (d) $\frac{11}{12}$
13. The ratio of the volumes of two spheres is 8 : 27. The ratio between their surface areas is
 (a) 2 : 3 (b) 4 : 27 (c) 8 : 9 (d) 4 : 9
14. A die is thrown once. Find the probability of getting a number which lies between 2 and 5.
 (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{5}$
15. The distance of the point $(-3, 4)$ from the x -axis is
 (a) 2 units (b) 3 units (c) 4 units (d) 6 units
16. Write the modal class for the following frequency distribution.
- | Class-interval | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 | 35-40 |
|----------------|-------|-------|-------|-------|-------|-------|
| Frequency | 30 | 35 | 75 | 40 | 30 | 15 |
- (a) 10 - 15 (b) 20 - 25 (c) 35 - 40 (d) 25 - 30
17. Find the ratio in which the y -axis divides the line segment joining the points $(5, -6)$ and $(-1, -4)$.
 (a) 5 : 1 (b) 4 : 1 (c) 2 : 3 (d) 5 : 2
18. A box contains 100 red cards, 200 yellow cards and 50 blue cards. If a card is drawn at random from the box, then find the probability that it will be a blue card.
 (a) $\frac{1}{3}$ (b) $\frac{1}{7}$ (c) $\frac{1}{5}$ (d) $\frac{1}{4}$

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) :** If HCF of two numbers is 13 and their product is 39×91 , then their LCM is 273.

Reason (R) : HCF of two coprime numbers is always > 1 .

20. **Assertion (A) :** A sector is cut from a circle of radius 42 cm. If the central angle of the sector is 150° , then the perimeter of the sector is 194 cm.

Reason (R) : Perimeter of sector = $2(\text{radius}) + \text{Length of corresponding arc of sector}$.

SECTION B

Section B consists of 5 questions of 2 marks each.

21. (a) If $x^3 + y = 2249$, where x and y are natural numbers and HCF of x and y is not 1, then find the value of $(x + y)$.

OR

(b) Find the largest possible positive integer that divides 125, 162 and 259 leaving remainder 5, 6 and 7 respectively.

22. (a) A bag contains 18 balls out of which x balls are red. If one ball is drawn at random from the bag, then what is the probability that it is not red?

OR

(b) A bag contains 20 balls out of which x balls are white. If one ball is drawn at random, the probability of drawing a white ball is y . Now place this ball and 10 more white balls in the bag. Now if a ball is drawn from the bag, the probability of drawing the white ball is $2y$. Find x .

23. If the mid-point of the line segment joining $A\left(\frac{x}{2}, \frac{y+1}{2}\right)$ and $B(x+1, y-3)$ is $C(5, -2)$, then find x and y .

24. If θ is acute and $\frac{\cos^2 \theta}{\cot^2 \theta - \cos^2 \theta} = 3$, then θ find the value of is equal to θ .

25. The x -coordinate of a point P is twice its y -coordinate. If P is equidistant from $Q(2, -5)$ and $R(-3, 6)$, then find the coordinates of P .

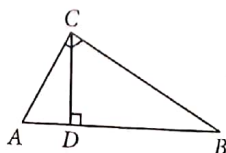
SECTION C

Section C consists of 6 questions of 3 marks each.

26. (a) The perimeters of two similar triangles ABC and PQR are respectively, 18 cm and 12 cm. If $PQ = 5$ cm and $BC = 6$ cm, then find AB and QR .

OR

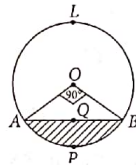
(b) In the given figure, $\angle ACB = 90^\circ$ and $CD \perp AB$. Prove that $\frac{CB^2}{CA^2} = \frac{BD}{AD}$.



27. In a class test, the sum of the marks obtained by Ankur in Mathematics and Science is 28. If he had got 3 more marks in Mathematics and 4 marks less in Science, then product of marks obtained in the two subjects would have been 180. Find the marks obtained in the two subjects separately.
28. Obtain the zeroes of the quadratic polynomial $\sqrt{3}x^2 - 8x + 4\sqrt{3}$ and verify the relationship between its zeroes and coefficients.
29. If $\cot \theta = \sqrt{1 - k^2}$, then find the value of $\operatorname{cosec} \theta + \cot^3 \theta \sec \theta$.
30. (a) AB is a chord of a circle with centre O and radius 4 cm. AB is of length 4 cm and divides the circle into two segments. Find the area of the minor segment and major segment. (Use $\sqrt{3} = 1.73$)

OR

- (b) In the given figure, AB is a chord of a circle, with centre O and radius 10 cm, that subtends a right angle at the centre of the circle. Find the area of the minor segment AQB . Hence, find the area of major segment $ALBQA$. [Use $\pi = 3.14$]



31. Prove that $7 - 2\sqrt{3}$ is an irrational number.

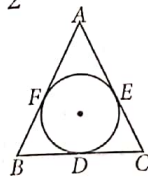
SECTION D

Section D consists of 4 questions of 5 marks each.

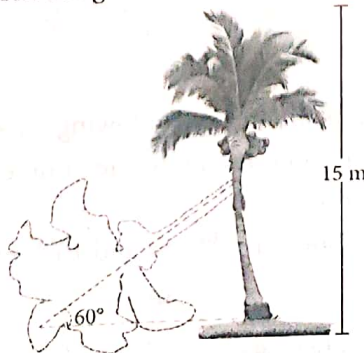
32. (a) Draw the graph of the following pair of linear equations :
 $x + 3y = 6$ and $2x - 3y = 12$
 Find the ratio of the areas of the two triangles formed by first line, $x = 0$, $y = 0$ and second line, $x = 0$, $y = 0$.

OR

- (b) Mr. Sehgal buys 4 chairs and 5 tables for ₹ 3400. Later he buys another chair and 4 tables more of the same type for ₹ 2500. Represent this situation algebraically and graphically.
33. In the adjoining figure, the incircle of $\triangle ABC$ touches the sides BC , CA and AB at D , E and F respectively. Show that $AF + BD + CE = AE + BF + CD = \frac{1}{2}$ (Perimeter of $\triangle ABC$).



34. Jigyasa has a garden in his bungalow which has various trees. But on a stormy day, a vertical straight tree, 15 m high, is broken by the wind, in such a way that its top just touches the ground and makes an angle of 60° with the ground. At what height from the ground did the tree break? (Use $\sqrt{3} = 1.73$)



35. (a) Ramana has an apple orchard with 90 apple trees. A data on number of apples on each tree is collected and is organised as a grouped distribution as shown here.

Number of Apples	Number of Trees
40-60	12
60-80	11
80-100	14
100-120	16
120-140	13
140-160	15
160-180	9

Find the mode and median of the above data.

OR

- (b) In an examination, 150 students appeared, and their marks (out of 200) are given in the following frequency distribution. Find the missing frequencies x and y , when it is given that mean marks is 103.

Marks	Number of students
0-25	2
25-50	10
50-75	x
75-100	30
100-125	y
125-150	15
150-175	12
175-200	4

SECTION E

Section E consists of 3 case study based questions of 4 marks each.

36. Meena's mother started a new shoe shop. To display the shoes, she put 3 pairs of shoes in 1st row, 5 pairs in 2nd row, 7 pairs in 3rd row and so on.



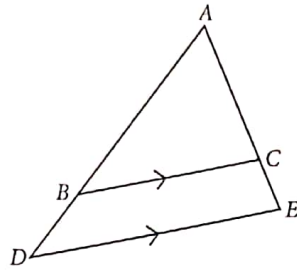
On the basis of the above information, answer the following questions.

- (i) If she puts a total of 120 pairs of shoes, then find the number of rows required.
 (ii) Find the pairs of shoes in 30th row.
 (iii) (a) Find difference of pairs of shoes in 17th row and 10th row.

OR

- (iii) (b) Find the total number of pairs of shoes in 5th and 8th row.

37. Sheela was revising her chapter on triangles for her upcoming test. Then she started recalling statement 'If a line is drawn parallel to one side of a triangle then it divides the other two sides in the same ratio' and drawn the following figure on the paper. Help Sheela in revising the topic.



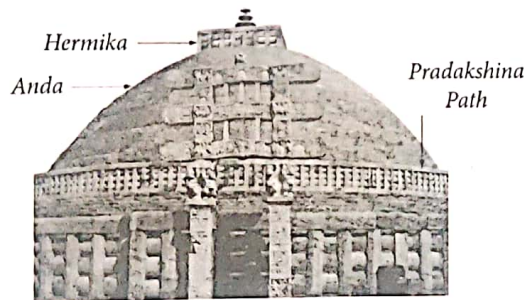
On the basis of the above information, answer the following questions.

- (i) If $AC = 10$ cm and B divides AD in ratio of $5 : 3$, then find the value of AE .
 (ii) If $AD : AB = 11 : 5$, then find $BC : DE$.
 (iii) (a) If $AB : BD = 6 : 10$, then find the ratio of medians drawn from A to $\triangle ABC$ and $\triangle ADE$.

OR

- (iii) (b) If $AC : CE = 4 : x$ and $AB : BD = 5 : y$, then find the value of $x : y$.

38. Ajay is a Class X student. His class teacher Mrs. Kiran arranged a historical trip to great Stupa of Sanchi. She explained that Stupa of Sanchi is great example of architecture in India. Its base part is cylindrical in shape. The dome of this stupa is hemispherical in shape, known as *Anda*. It also contains a cubical shape part called *Hermika* at the top. Path around *Anda* is known as *Pradakshina Path*.



On the basis of the above information, answer the following questions.

- (i) Find the lateral surface area of the *Hermika*, if the side of cubical part is 8 m.
 (ii) The radius of the *Pradakshina path* is 25 m. If the Buddhist priest walks 14 rounds on this *path*, then find the distance covered by the priest.
 (iii) (a) The diameter and height of the cylindrical base part are respectively 42 m and 12 m. If the volume of each brick used is 0.01 m^3 , then find the number of bricks used to make the cylindrical base.

OR

- (iii) (b) If the diameter of the *Anda* is 42 m, then find the volume of the *Anda*.