

Sample Question Paper 11

Mathematics 10th (Standard)

Time : 3 Hrs.

Max. Marks : 80

General Instructions

Read the following instructions carefully and follow them.

1. This question paper contains 38 questions. All questions are compulsory.
2. This question paper is divided into 5 section A, B, C, D and E.
3. In **Section A**, question numbers 1-18 are Multiple Choice Questions (MCQs) and question number 19 and 20 are Assertion-Reason based questions of 1 mark each.
4. In **Section B**, question numbers 21-25 are Very Short Answer (VSA) type questions, carrying 02 marks each.
5. In **Section C**, question numbers 26-31 are Short Answer (SA) type questions, carrying 03 mark each.
6. In **Section D**, question numbers 32-35 are Long Answer (LA) type questions, carrying 05 marks each.
7. In **Section E**, question numbers 36-38 are Case Study Based questions carrying 4 marks each with sub parts of the values 1, 1 and 2 marks each respectively.
8. There is no overall choice. However, an internal choice in 2 questions 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 clear figures wherever required. Take $\pi = 22/7$ wherever required if not stated.
10. Use of calculators is not allowed.

Section A Multiple Choice Questions (Each Que. carries 1 M)

1. Find the length of arc, when arc subtended an angle of 120° to the centre of circle, radius of 20 cm.

(a) $\frac{40}{3}\pi$ cm (b) 40π cm (c) $\frac{40}{3}$ cm (d) 50 cm

2. Find the mean of the following frequency distribution.

Class interval	1-5	5-9	9-13	13-17
Frequency	4	13	7	6

(a) 7 (b) 8 (c) 9 (d) 8.5

3. Find the nature of the roots of the quadratic equation $3x^2 - 4\sqrt{3}x + 4 = 0$.

(a) Real and equal roots (b) No real root (c) Distinct real roots (d) None of these

4. The solution of the system of equations $2x - 3y = 7$ and $5x + y = 10$ is

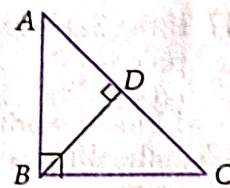
(a) $x = \frac{17}{37}, y = \frac{17}{15}$ (b) $x = \frac{-15}{17}, y = \frac{37}{17}$ (c) $x = \frac{37}{17}, y = \frac{-15}{17}$ (d) $x = \frac{15}{17}, y = \frac{37}{17}$

5. If $\cot \theta = \frac{12}{35}$, then $\sin \theta$ is

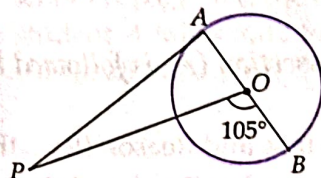
(a) $\frac{12}{37}$ (b) $\frac{37}{35}$ (c) $\frac{37}{12}$ (d) $\frac{35}{37}$

Stage III : Excellence Level

6. In the given figure, $\angle ABC = 90^\circ$ and $BD \perp AC$. If $BD = 12$ cm and $AD = 6$ cm, then the value of CD is



- (a) 24 cm (b) 20 cm
(c) 22 cm (d) 26 cm
7. In the given figure, PA is a tangent from an external point P to a circle with centre O . If $\angle POB = 105^\circ$, then the value of $\angle APO$ is



- (a) 105° (b) 75° (c) 15° (d) 60°
8. If PA and PB are tangents drawn from point P outside the circle such that $PA = 10$ cm and $\angle APB = 60^\circ$, then the length of chord AB is

- (a) 12 cm (b) 5 cm (c) 6 cm (d) 10 cm
9. If $7\sin^2\theta + 3\cos^2\theta = 4$ then the value of $\tan\theta + \operatorname{cosec}\theta$ is
- (a) 2 (b) $\frac{2}{\sqrt{3}}$ (c) $\frac{1}{\sqrt{3}} + 2$ (d) None of these

10. In the given figure, $P(5, -3)$ and $Q(3, y)$ are the points of trisection of the line segment joining $A(4, 7)$ and $B(1, -5)$.

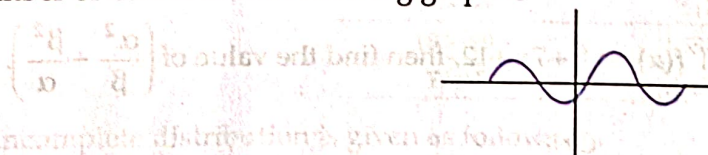


Then, y is equal to

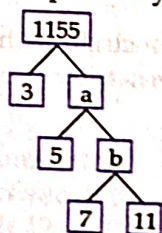
- (a) 2 (b) 4 (c) -4 (d) $-\frac{5}{2}$
11. Three chairs and two tables cost ₹ 185. Five chairs and three tables cost ₹ 285. The total cost of one chair and one table is
- (a) ₹ 80 (b) ₹ 85 (c) ₹ 90 (d) ₹ 95

12. If one root of the equation $(k-1)x^2 - 10x + 3 = 0$ is the reciprocal of the other, then the value of k is
- (a) 1 (b) 3 (c) 4 (d) -1

13. The number of zeroes in the following graph is



- (a) 0 (b) 3 (c) 5 (d) 1
14. The distance of the point $(3, 11)$ from origin
- (a) $\sqrt{130}$ units (b) $\sqrt{110}$ units (c) 13 units (d) 12 units
15. The sum of all integers between 50 and 350 which end up with 1, is
- (a) 5880 (b) 8058 (c) 8850 (d) 5890
16. The values of a and b in the given factor tree, respectively are



- (a) 385, 77 (b) 77, 11 (c) 77, 385 (d) 7, 385

17. If the Sun's angle of elevation is 30° and height of the pole is 8 m then the length of the shadow of the pole is
 (a) 8 m (b) $8\sqrt{3}$ m (c) $\sqrt{3}$ m (d) None of these
18. If the difference between median and mean is 18 then the difference between mode and median is
 (a) 36 (b) 38 (c) 2 (d) 6

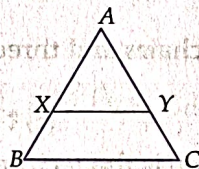
Assertion-Reason Based Questions

In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (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 but 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 probability of winning a game is 0.4, then the probability of losing it, is 0.6.
 Reason (R) If E be an event then $P(E) + P(\text{not } E) = 1$.
20. Assertion (A) Degree of polynomial $4x^6 + 10x^5 + 3x^3 + 16x^2 + 3$ is 6.
 Reason (R) The highest exponent of a variable in the polynomial is called its degree.

Section B Very Short Answer Type Questions (Each Que. carries 2 M)

21. In the adjoining figure, $XY \parallel BC$. If $AX = 3$ cm and $XB = 1.5$ cm, then find the value of $\frac{AY}{YC}$.



22. LCM and HCF of two numbers are 360 and 60, respectively. If one of the number is 180 then find the other number.

23. (a) If α and β are the zeroes of polynomial $f(x) = x^2 + 7x + 12$, then find the value of $\left(\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}\right)$.

Or

- (b) Find a quadratic polynomial whose zeroes are 7 and -4 .
24. If a building of height $12\sqrt{3}$ m casts a shadow of 36 m long on the ground, then find the angle of elevation to the Sun.
25. (a) In a given circle, PA is tangent to the circle of radius 8 cm with centre O . If length of PA is 15 cm, then find the distance of point P from the centre.
 Or
 (b) If AB is a tangent drawn from a point A to a circle with centre O and BOC is a diameter of the circle such that $\angle AOC = 130^\circ$ then find $\angle OAB$.

Section C Short Answer Type Questions (Each Que. carries 3 M)

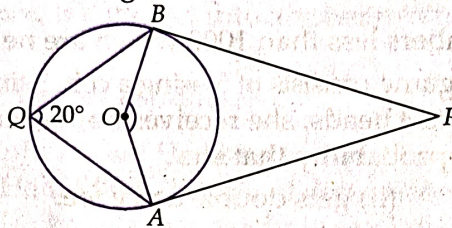
26. (a) The students of a class are made to stand in rows. If 4 students are extra in each row, there would be 2 rows less. If 4 students are less in each row, there would be 4 rows more. Find the number of students in the class.

Or (b) A part of monthly hostel charge in a school is fixed and the remaining depends on the number of days one has taken food in the mess. When a student A takes food for 22 days, he has to pay ₹ 1380 as hostel charge, whereas a student B who takes food for 28 days, pays ₹ 1680 as hostel charge. Find the fixed charge and the cost of food per day.

27. For $A = 60^\circ$, verify that $\frac{1 + \sin A}{\cos A} = \frac{\cos A}{1 - \sin A}$.

28. Show that $8\sqrt{3}$ is an irrational number.

29. In given figure, find the angle between tangents to the circle from an external point P.



30. (a) The given table gives the enrollment in Higher Secondary School in year 1978. Find the average enrollment in HS School.

Enrollment	Number of schools
20-39	526
40-59	620
60-79	674
80-99	717
100-119	681
120-139	612
140-159	540
160-179	517
180-199	552
Total	5439

- Or (b) An incomplete distribution is given as follows.

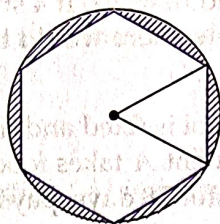
Class interval	Frequency
0-10	10
10-20	20
20-30	f_1
30-40	40
40-50	f_2
50-60	25
60-70	15

The median value is 35 and the sum of all the frequencies is 170. Using the median formula, find the missing frequencies f_1 and f_2 .

31. A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 sq m more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the rectangular park and of altitude 12 m. Find the length and breadth of the rectangular park.

Section D Long Answer Type Questions (Each Que. carries 5 M)

32. A round table cover has six equal designs as shown in the figure.



If the radius of the cover is 28 cm, then find the cost of making the design at the rate of ₹ 1.50 per cm^2 .
(take $\sqrt{3} = 1.732$)

33. (a) Suppose the 8th term of an AP is 31 and 15th term is 16 more than the 11th term.

(i) Find the AP.

(ii) Find the sum of first 15 terms of AP.

Or (b) Find the sum of all natural numbers less than 1000 which are neither divisible by 5 nor by 2.

34. In a game, the entry fee is ₹ 5. The game consists of tossing a coin 3 times. If one or two heads show, Sweta gets her entry fee back. If she throws 3 heads, she receives double entry fee. Otherwise she will lose. For tossing a coin three times, find the probability that she

(i) loses the entry fee.

(ii) gets double entry fee.

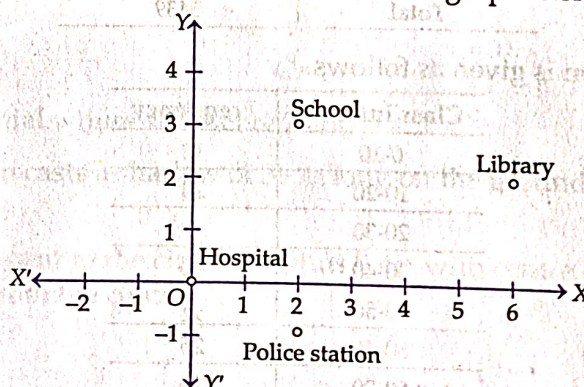
(iii) just gets her entry fee back.

35. (a) In a trapezium PQRS, $PQ \parallel RS$ and $RS = 2PQ$, $TU \parallel PQ$ where T and U lie on QR and PS, respectively such that $\frac{QT}{TR} = \frac{4}{3}$. Diagonal QS intersects TU at V. Prove that $7TU = 11PQ$.

Or (b) In ΔUVW , X and Y are points on VU and UW, respectively such that the points divide the respective sides in the ratio 2 : 1. If $XY = 7$ units then find the length of VW.

Section E Case-Study/Passage-Based (Each Que. carries 4 M)

36. Kushal is a Class X student residing in a village. One day, he went to a city hospital along with his grandfather for general checkup. From there, he visited three places school, library and police station. After returning to his village, he plotted a graph by taking hospital as origin and marked three places on the graph as per his direction of movement and distance. The graph is shown below.



Based on the above information, answer the following questions.

(i) Find distance between school and hospital.

(ii) (a) Find nearest place to library.

Or (b) Find the ratio, in which X-axis divides the line joining school and police station.

(iii) Find the coordinates of the mid-point between police station and library.

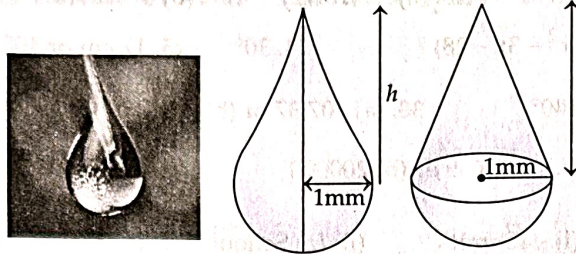
(1)

(2)

(2)

(1)

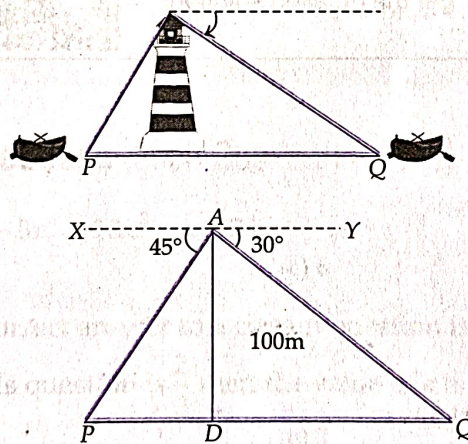
37. In the month of December 2020, it rained heavily throughout the day over the city of Hyderabad. Anil observed the raindrops as they reached him. Each raindrop was in the shape of a hemisphere surmounted by a cone of the same radius of 1 mm. Volume of one of such drops is 3.14 mm^3 . Anil collected the rain water in a pot having a capacity of 1099 cm^3 . (use $\sqrt{2} = 1.4$)



Based on the above information, answer the following questions.

- (i) Find the total height of the drop. (1)
 - (ii) What is the curved surface area of the drop? (1)
 - (iii) (a) As the drop fell into the pot, it changed into a sphere. What was the radius of the sphere? (2)
- Or
- (b) How many drops will fill the pot completely? (2)

38. A boy is standing on the top of light house. He observed that boat P and boat Q are approaching the light house from opposite directions. He finds that angle of depression of boat P is 45° and angle of depression of boat Q is 30° . He also knows that height of the light house is 100 m.



Based on the above information, answer the following questions.

- (i) What is the measure of $\angle APD$? (1)
 - (ii) If $\angle YAQ = 30^\circ$, then $\angle AQD$ is also 30° . Why? (1)
 - (iii) (a) How far is boat P from the light house? (2)
- Or
- (b) How far is boat Q from the light house? (2)