

Class IX Session 2023-24
Subject - Mathematics
Sample Question Paper - 10

Time Allowed: 3 hours

Maximum Marks: 80

General Instructions:

1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each.
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E.
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

Section A

1. $(1296)^{\frac{-1}{4}} =$ [1]
a) 6
b) $-\frac{1}{6}$
c) -6
d) $\frac{1}{6}$
2. The graph of $y = 6$ is a line [1]
a) Parallel to x-axis at a distance 6 units from the origin
b) Making an intercept 6 on the x- axis.
c) Making an intercept 6 on both the axes.
d) Parallel to y-axis at a distance 6 units from the origin
3. Signs of the abscissa and ordinate of a point in the second quadrant are respectively. [1]
a) (-, +)
b) (+, -)
c) (+, +)
d) (-, -)
4. In a histogram the area of each rectangle is proportional to [1]
a) the class size of the corresponding class interval
b) cumulative frequency of the corresponding class interval
c) the class mark of the corresponding class interval
d) frequency of the corresponding class interval

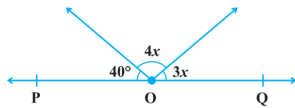
5. If $(2, 0)$ is a solution of the linear equation $2x + 3y = k$, then the value of k is [1]

- a) 2
- b) 4
- c) 5
- d) 6

6. The things which are double of the same things are [1]

- a) equal
- b) halves of the same thing
- c) unequal
- d) double of the same thing

7. In the figure, POQ is a line. The value of x is [1]



- a) 25°
- b) 30°
- c) 20°
- d) 35°

8. If a diagonal AC and BD of a quadrilateral $ABCD$ bisect each other, then $ABCD$ is a [1]

- a) Parallelogram
- b) Rhombus
- c) Rectangle
- d) Triangle

9. If $10x - 4x^2 - 3$, then the value of $p(0) + p(1)$ is [1]

- a) -3
- b) 0
- c) 3
- d) 1

10. **The cost of a notebook is twice the cost of a pen.** The equation to represent this statement is [1]

- a) $2x = 3y$
- b) $x = 3y$
- c) none of these
- d) $x - 2y = 0$

11. In $\triangle ABC$, E is the mid-point of median AD such that BE produced meets AC at F . If $AC = 10.5$ cm, then $AF =$ [1]

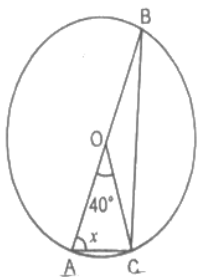
- a) 2.5 cm
- b) 5 cm
- c) 3 cm
- d) 3.5 cm

12. D and E are the mid-points of the sides AB and AC of $\triangle ABC$ and O is any point on the side BC , O is joined to [1]

A . If P and Q are the mid-points of OB and OC res, Then $DEQP$ is

- a) A Triangle
- b) A Rectangle
- c) A Rhombus
- d) A Parallelogram

13. In a figure, O is the centre of the circle with AB as diameter. If $\angle AOC = 40^\circ$, the value of x is equal to [1]

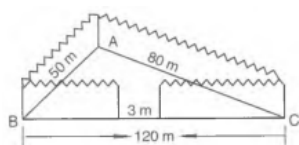


- a) 80°
- b) 50°
- c) 70°
- d) 60°

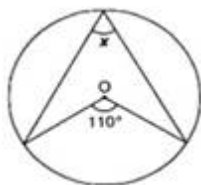
14. The value of 1.9999..... in the form $\frac{p}{q}$, where 'p' and 'q' are integers and $q \neq 0$, is [1]
- a) $\frac{1999}{1000}$ b) $\frac{19}{10}$
 c) 2 d) $\frac{1}{9}$
15. The force applied on a body is directly proportional to the acceleration produced on it. The equation to represent the above statement is [1]
- a) $y = kx$ b) $y = x$
 c) $y + x = 0$ d) none of these
16. In a $\triangle ABC$, if $3\angle A = 4\angle B = 6\angle C$ then $A : B : C = ?$ [1]
- a) 6 : 4 : 3 b) 2 : 3 : 4
 c) 3 : 4 : 6 d) 4 : 3 : 2
17. To draw a histogram to represent the following frequency distribution : [1]
- | | | | | | |
|----------------|------|-------|-------|-------|-------|
| Class interval | 5-10 | 10-15 | 15-25 | 25-45 | 45-75 |
| Frequency | 6 | 12 | 10 | 8 | 15 |
- The adjusted frequency for the class 25-45 is
- a) 6 b) 5
 c) 2 d) 3
18. To make a closed hollow cone of base radius 7 cm and height 24 cm, the area of metal sheet required is [1]
- a) 704 cm^2 b) 825 cm^2
 c) 1100 cm^2 d) 550 cm^2
19. **Assertion (A):** The sides of a triangle are 3 cm, 4 cm and 5 cm. Its area is 6 cm^2 . [1]
Reason (R): If $2s = (a + b + c)$, where a, b, c are the sides of a triangle, then area = $\sqrt{(s-a)(s-b)(s-c)}$.
- a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.
 c) A is true but R is false. d) A is false but R is true.
20. **Assertion (A):** The equation of $2x + 5 = 0$ and $3x + y = 5$ both have degree 1. [1]
Reason (R): The degree of a linear equation in two variables is 2.
- a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.
 c) A is true but R is false. d) A is false but R is true.

Section B

21. A triangular park ABC has sides 120 m, 80 m and 50 m (in a given figure). A gardener Dhanika has to put a fence all around it and also plant grass inside. How much area does she need to plant? Find the cost of fencing it with barbed wire at the rate of ₹ 20 per metre leaving a space 3m wide for a gate on one side. [2]

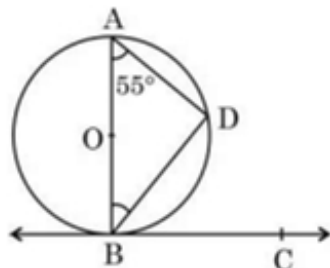


22. Find an angle marked as x in given figure where O is the centre of the circle: [2]



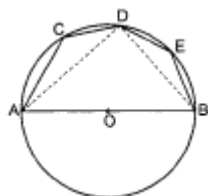
23. A hemispherical bowl made of brass has inner diameter 10.5 cm. Find the cost of tin-plating it on the inside at the rate of ₹32 per 100 cm^2 . [2]

24. In Fig., BC is tangent to the circle at point B of circle centred at O . BD is a chord of the circle so that $\angle BAD = 55^\circ$. Find $m \angle DBC$. [2]



OR

In given figure, AOB is a diameter of the circle and C, D, E are any three points on the semi-circle. Find the value of $\angle ACD + \angle BED$.



25. Express the linear equation in the form $ax + by + c = 0$ and indicate the values of a, b and c in $2x + 3y = 9.35$ [2]

OR

Find whether $(4, 0)$ is the solution of the equation $x - 2y = 4$ or not?

Section C

26. Solve the equation for x : $3^{2x+4} + 1 = 2 \times 3^{x+2}$ [3]
27. Find the value of the polynomial $3x^3 - 4x^2 + 7x - 5$, when $x = 3$ and also when $x = -3$. [3]
28. The perimeter of an isosceles triangle is 32 cm. The ratio of the equal side to its base is 3: 2. Find the area of the triangle. [3]

OR

Find the cost of laying grass in a triangular field of sides 50 m, 65 m and 65 m at the rate of Rs7 per m^2 .

29. Find the solution of the linear equation $x + 2y = 8$ which represents a point on [3]

- The x -axis
- The y -axis

30. P is the mid-point of the side CD of a parallelogram $ABCD$. A line through C parallel to PA intersects AB at Q and DA produced at R . Prove that $DA = AR$ and $CQ = QR$. [3]

OR

Show that the quadrilateral formed by joining the mid-points the sides of a rhombus, taken in order, form a rectangle.

31. Write the answer of each of the following questions: [3]
- What is the name of horizontal and the vertical lines drawn to determine the position of any point in the Cartesian plane?

ii. What is the name of each part of the plane formed by these two lines?

iii. Write the name of the point where these two lines intersect.

Section D

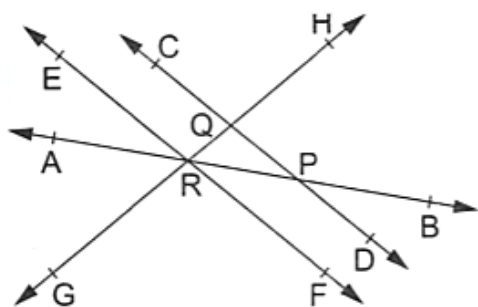
32. Find the values of a and b if $\frac{7+3\sqrt{5}}{3+\sqrt{5}} - \frac{7-3\sqrt{5}}{3-\sqrt{5}} = a + b\sqrt{5}$. [5]

OR

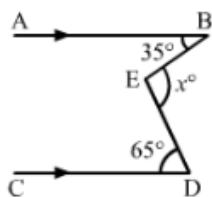
If $a = \frac{\sqrt{2}+1}{\sqrt{2}-1}$ and $b = \frac{\sqrt{2}-1}{\sqrt{2}+1}$, then find the value of $a^2 + b^2 - 4ab$.

33. In the adjoining figure, name: [5]

- Two pairs of intersecting lines and their corresponding points of intersection
- Three concurrent lines and their points of intersection
- Three rays
- Two line segments

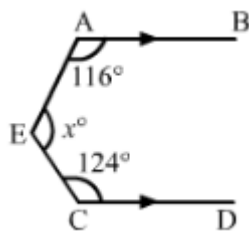


34. In each of the figures given below, $AB \parallel CD$. Find the value of x° in each case. [5]



OR

In each of the figures given below, $AB \parallel CD$. Find the value of x° in each other case.



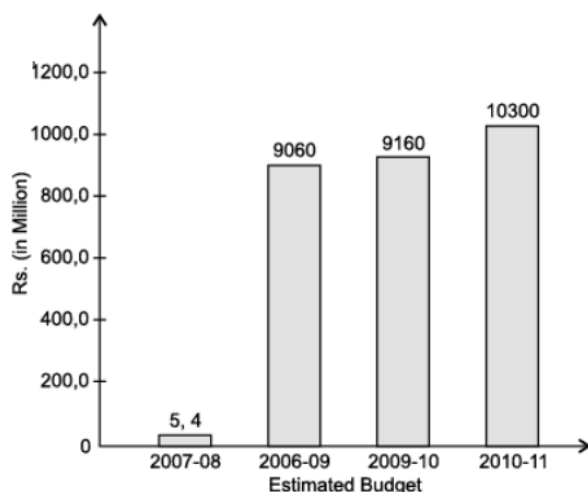
35. What must be added to $x^4 + 2x^3 - 2x^2 + x - 1$ so that the result is exactly divisible by $x^2 + 2x - 3$ [5]

Section E

36. Read the text carefully and answer the questions: [4]

Ladli Scheme was launched by the Delhi Government in the year 2008. This scheme helps to make women strong and will empower a girl child. This scheme was started in 2008.

The expenses for the scheme are plotted in the following bar chart.



- What are the total expenses from 2009 to 2011?
- What is the percentage of no of expenses in 2009-10 over the expenses in 2010-11?
- What is the percentage of minimum expenses over the maximum expenses in the period 2007-2011?

OR

What is the difference of expenses in 2010-11 and the expenses in 2006-09?

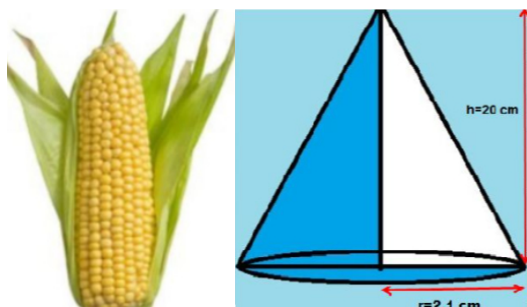
37. Read the text carefully and answer the questions:

[4]

Once upon a time in Ghaziabad was a corn cob seller. During the lockdown period in the year 2020, his business was almost lost.

So, he started selling corn grains online through Amazon and Flipcart. Just to understand how many grains he will have from one corn cob, he started counting them.

Being a student of mathematics let's calculate it mathematically. Let's assume that one corn cob (see Fig.), shaped somewhat like a cone, has the radius of its broadest end as 2.1 cm and length as 20 cm.



- Find the curved surface area of the corn cub.
- What is the volume of the corn cub?
- If each 1 cm^2 of the surface of the cob carries an average of four grains, find how many grains you would find on the entire cob?

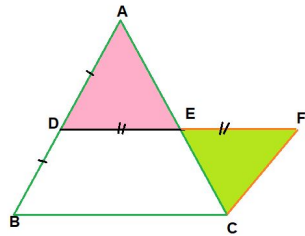
OR

How many such cubs can be stored in a carton of size $20 \text{ cm} \times 25 \text{ cm} \times 20 \text{ cm}$.

38. Read the text carefully and answer the questions:

[4]

Haresh and Deep were trying to prove a theorem. For this they did the following



- i. Draw a triangle ABC
- ii. D and E are found as the mid points of AB and AC
- iii. DE was joined and DE was extended to F so $DE = EF$
- iv. FC was joined.
 - (i) $\triangle ADE$ and $\triangle EFC$ are congruent by which criteria?
 - (ii) Show that $CF \parallel AB$.
 - (iii) Show that $CF = BD$.

OR

Show that $DF = BC$ and $DF \parallel BC$.