Time : 3 hrs. M.M. : 80

General Instructions :

1) The question paper has five sections A, B, C, D, E.

2) Section-A has 20 MCQs carrying 1 mark each.

3) Section-B has 5 questions carrying 2 marks each.

4) Section-C has 6 questions carrying 3 marks each and Section D has 5 marks each.

(Section-A)

1. An example of a whole number is

   a) 0   b) $\frac{-1}{2}$ c) $\frac{11}{5}$ d) -7

2. $32^{\frac{1}{5}}$ is equal to

   a) 4   b) 8   c) 2   d) 16

3. The degree of the polynomial $5x^2 - 6x - 2$ is

   a) 2   b) 1   c) 0   d) not defined

4. Find the value of polynomial in $y^2 - 5y + 6$ at $y = 0$

   a) 1   b) 6   c) -5   d) -6

5. Factors of $3x^2 - x - 4$ are

   a) $(x - 1)(3x - 4)$ b) $(x + 1)(3x - 4)$ c) $(x + 1)(3 + 4)$ d) $(x - 1)(3x + 4)$

6. Zero of the polynomial $P(x)$ where $P(x) = ax + 1$ where $a \neq 0$ is

   a) 1   b) -a   c) 0   d) $\frac{-1}{a}$

7. The point (0, 5) lies on

   a) on x-axis   b) on y-axis   c) In II quadrant   d) IN IV quadrant

8. Express $5x = -8y$ in the form of $ax + by + c = 0$

   a) $5x - 8y + 0 = 0$ b) $5x + 8y + 0 = 0$ c) $8x - 5y + 0 = 0$

   d) $8x + 5y + 0 = 0$

9. Let Y varies directly as x if $y = 24$ when $x = 8$ then the linear equation is
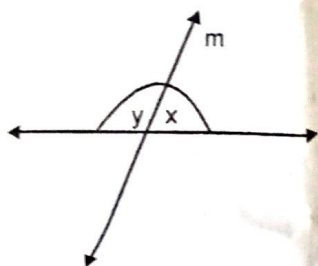
   a) $3y = x$ b) $y = x$ c) $y = 4x$ d) $y = 3x$

10. How many common points do two distinct lines have

   (a) 1   (b) 2   (c) 3   d (0)

IX, Maths-1

11. To solve the equation a - 20 = 15 we use Euclid's axiom

(a) First   (b) Second   (c) Third   (D) Fourth

12. In fig if $x : y = 1 : 4$ then value of x and y are respectively

(a) 36,144   (b) 18,72   (c) 144,36   (d) 78,18

13. If the difference between two complementary angle is $10°$ then the angles are

(a) $50°,60°$ (b) $50°, 40°$ (c) $80°, 10°$ (d) $35°, 45°$

14. If two sides and the included angle of one triangle are equal to two sides and the included angle of another triangles must be congruent by the rule.

(a) SAS   (b) ASA   (c) AAS   (d) All of the above

15. In $\triangle ABC$ $\angle A = \angle C$ and BC = 4cm and AC = 3cm the length of the side AB is

(a) 2cm   (b) 4cm   (c) 3cm   (d) 2.5cm

16. In Isosceles $\triangle PQR$, PS is an altitude and PQ = PR then PS bisects

(a) QR   (b) PR   (c) PQ   (d) RS

17. In a grouped frequency data class intervals. are 0-20, 20-40, 40-60 then the class width is

(a) 10   (b) 30   (c) 20   (d) 15

18. For a given data the difference between the maximum and minimum observation is known as its

(a) Class   (b) Range   (c) Class mark   (d) class limit

Direction: In the following question (19-20) a statement of assertion (A) is followed by a statement of reason (R) is given. Choose the correct answer out of the following choices.

a) Both assertion (A) and reason (R) are true and reason (R) is correct explanation of assertion (A)

b) Both assertion (A) and reason (R) are true but reason (R) is not 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.

IX, Maths-2

19. Assertion (A) : The Value of $(102)^3 = 1061208$.

Reason (R) : $(x + y)^3 = x^2 + y^3 + 3xy(x + y)$

20. Assertion (A) : The sides opposite to equal angles of a triangle are not equal.

Reason (R) : Angle opposite to equal sides of triangle are equal. $1 \times 20 = 20$

Section-B

21. Rationalise the denominator of

$$\frac{1}{\sqrt{5} + \sqrt{2}}$$

22. Evaluate $\left(\dfrac{32}{243}\right)^{\frac{-4}{5}}$

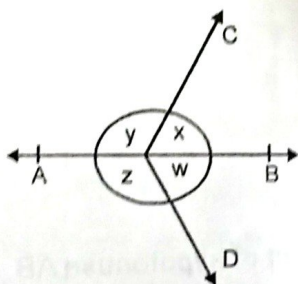23. Which one of the following option is true and why?

$y = 3x + 5$ has

(a) a unique solution   (b) only two solution   (c) Infinitely many solutions

24. In the given fig. if $x + y = w + z$ then prove that AOB is a line

25. Below are the marks obtained by 30 student of a class in maths test out of 100

Class interval	Frequency
30-40	3
40-50	8
50-60	8
60-70	4
70-80	2
80-90	2
90-100	1
Total	30

Draw a histogram to represent the data.

$(5 \times 2 = 10)$

IX, Maths-3

26. Find the Value of a and by if $\dfrac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$

27. Factorise $27y^3 + 125Z^3$

28. A point lies on positive direction of x-axis from the y-axis. What are its coordinates ? What will be the coordinates if it lies on negative direction of the y-axis at distance of 7-units from the x-axis.
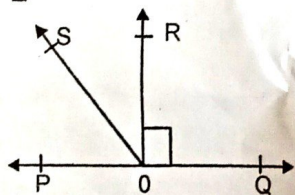
OR

Which of the following points lies on the y-axis and x-axis ?

a) A(1, 1), B(1,0), C(0,1), D(0, 0), E(0, -1) F ((-1, 0) G(0, 5), H(-7, 0) and I (3, 3)

29. Write four solutions for the equation $2x + y = 7$

30. In the given figure POQ in a line. Ray OR is perpendicular to line PQ a line. OS is another ray lying between ray OP and OR.
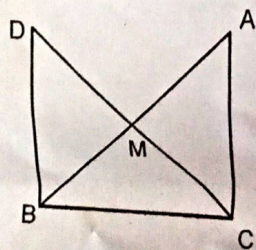
Prove that $\angle ROS = \dfrac{1}{2}(\angle QOS - \angle POS)$

31. In rt $\angle$d $\triangle$ ABC right angled at c, M is the mid point of hypotenuse AB. C is joined to M and produced to a point D such that DM = CM. Point D is joined to point B show that

(i) $\triangle AMC \cong \triangle BMD$ (ii) $\angle DBC$ is a right angle. (iii) $\triangle DBC \cong \triangle ACB$

(iv) $CM = \dfrac{1}{2} AB$

$6 \times 3 = 18$

Section D

32. i) Represent $\sqrt{5}$ on the number line.

ii) Express $0.\overline{6}$ in the form $\dfrac{P}{q}$ where P, q are integers and $q \neq 0$.

33. Factorise $2y^3 + y^2 - 2y - 1$

IX, Maths-4

c) If $2x + 3y = 12$ and $xy = 6$ then find the value of $4x^2 + 9y^2$.

d) Find the valve of $4x^2 - 9y^2$ if $2x + 3y = 12$ and $xy = 6$

38. Short distance travelling was transformed by the advent of the scooters. Users who are always on the lookout for cheaper travel options really appreciated the initiative, for no one really likes to pay hafty amounts for minuscule ride.

So, electric scooters are becoming an increasingly important part of our transport method. The electric scooter market is projected to register a compound annual growth rate. The revenue in the E-scooter sharing segment is given below :
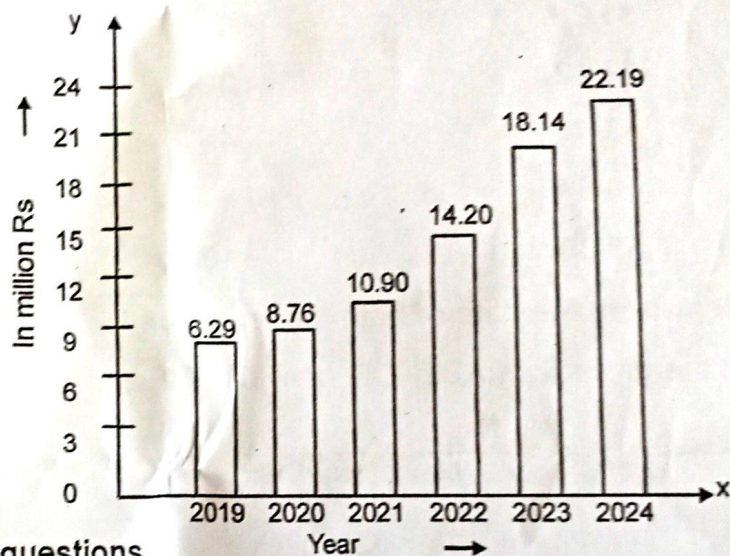
Now Answer the following questions.

(a) What amount of revenue is projected in 2024?.

(b) What is the % age increase of growth is there in 2023 than 2022 ?

(c) Is the revenue growth increasing or decreasing from 2019 onwards ?

(d) State the reason behind the growing use of electric scooters by the general public.

39. Prime Minister's National Relief Fund is the fund raised to provide support far people affected by natural and man made disaster. Natural disasters that are covered under this include flood, cyclone earthquake etc. Man made disasters that are included are major accidents acid attacks, riots etc.

Two friends Sohan and Mohan, together contributed ₹ 300 towards Prime Minister Relief Fund.

(a) How you represent the above situation in linear equations in two variables?

(b) If Sohan contributed ₹ 80 then how much was contributed by Mohan?

(c) If both contributed equally then how much is contributed by each?

(d) What is the standard form of linear equation $x = -5$?

$3 \times 4 = 12$

34. The runs scored by two team A and B on the first 60 balls in a cricket match are given below.

No. of balls	Team A	Team B
1-6	2	5
7-12	1	6
13-18	8	2
19-24	9	10
25-30	4	5
31-36	5	6
37-42	6	3
43-48	10	4
49-54	6	8
55-60	2	10

Represent the data of both the teams on the same graph by frequency polygons.

35. a) In the given fig if AB $\parallel$ CD, $\angle APQ = 50°$ and $\angle PRD = 127°$ find x and y.
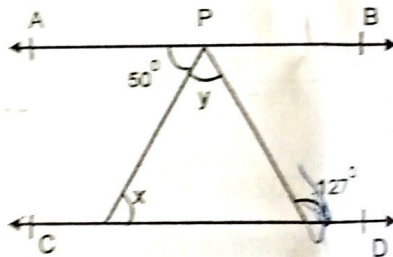
b) Show that the angles of an equilateral triangle ABC are $60°$ each. $5 \times 4 = 20$

(Section E)

Case Based Questions

36. Mobile phones are very harmful for our eyes if they are used for a longer period of time school going children spend long hours on phone in their free time and as a result their eyesight become weak. To generate awareness about the ill effect of "using mobile phone for long hours" a group of $(2x + 3y)$ teachers 'xy' boys and $(8x^3 + 27y^3)$ girls in a school started the campaign on the same.

Based on the above information answer the following questions :

(a) Name the mathematical concept used here

(b) If the no. of teacher is 12 and no. of boys is 6 in the group, then how many girls are there in the group.