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IX −E

The question paper has 6 printed page(s)

BAL BHARATI PUBLIC SCHOOL
CLASS –IX (2024-25)
MATHEMATICS **SET-B**
MIDTERM EXAMINATION

TIME: 3 HRS

MM: 80
DATE: 05.08.24

GENERAL INSTRUCTIONS:
1. The question paper consists of 38 questions divided into 5 Sections A, B, C, D and E.
2. Section A consists of 20 multiple choice type questions carrying 1 mark each.
3. Section – B has 5 very short answer type questions carrying 2 marks each.
4. Section- C has 6 short answer type questions carrying 3 marks each.
5. Section- D has 4 long answer type questions carrying 5 marks each.
6. Section- E has 3 Case study-based questions carrying 4 marks each.

SECTION A

Q1. How many linear equations in x and y can be satisfied by x = 6 and y =12?
(a) Only one   (b) Two   (c) Infinitely many   (d) Three ·

Q2. Factors of $x^2 + 16x + 28$ are
(a) $(x + 14) (x – 2)$ (b) $(x – 14) (x – 2)$ (c) $(x – 14) (x + 2)$ (d) $(x + 14) (x + 2)$

Q3. Irrational number between 2.011243 ... and 2.012243 ... is
(a) 2.011143 ...   (b) 2.012343 ...   (c) 2.01152243 ....   (d) 2.013243

Q4. Volume of a cuboid is $5x^2 – 125$. Then possible dimensions are
(a) 5, (x – 5), (x + 5)   (b) 5,5,5   (c) 5, $x^2 – 25x$ (d) 5, x^2, 25x

Q5. For the polynomial x + 5
(a) only 5 is a zero   (b) only -5 is a zero   (c) no, none is a zero   (d) yes, both are zeros

Q6. The solution of the linear equation x + 2y = 8 which represents a point on x-axis is
a) (0,4)   b) (0,-4)   c) (4,0)   d) (-4,0)

Q7. If x-coordinate of a point is zero, then this point always lies
(a) in I quadrant   (b) in II quadrant   (c) on x-axis   (d) on y-axis

Q8. Abscissa of a point is positive in
(a) I and II quadrants.   (b) I and III quadrants.   (c) II and III quadrants.   (d) I and IV quadrants.

Q9. Given the class intervals 0–20, 20–40, 40–60, ..., then 40 is considered in class
(a) 40–60   (b) 20–40   (c) 35–40   (d) 30–40

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Q10. Given a rational number (-8/5). This rational number can also be known as

(a) a natural number   (b) a whole number   (c) an integer   (d) a real number

Q11. If the decimal representation of a number is non-terminating but repeating, then the number is

(a) a natural number   (b) a rational number   (c) a whole number   (d) an irrational number

Q12. $-\dfrac{\sqrt{28}}{\sqrt{343}}$ is a

(a) a natural number   (b) a fraction   (c) an irrational number   (d) a rational number.

Q13. Any point on the line y = x is of the form

(a) (a, -a)   (b) (0, a)   (c) (a, 0)   (d) (-a, – a)

Q14. In the given figure, PQ ∥ RS and ∠ACS = 127°. ∠BAC is
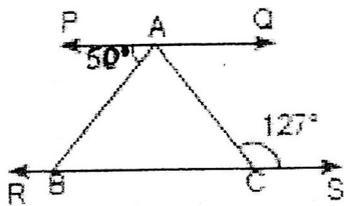
(a) 53°   (b) 77°   (c) 50°   (d) 107°

Q15. A traffic signal board is equilateral in shape, with words 'SCHOOL AHEAD' with on it. The perimeter of the board is 180 cm, then the area of the signal board is

(a) 2826 cm^2 (b) 1413 cm^2 (c) $900\sqrt{3}$ cm^2 (d) $100\sqrt{3}$ cm^2

Q16. The point which lies on y-axis at a distance of 6 units in the positive direction of y-axis is

(a) (0, 6)   (b) (6, 0)   c) (0, –6)   (d) (–6, 0)

Q17. A straight line may be drawn from any one point to any other point is stated in form of

(a) an axiom   (b) a definition   (c) a postulate   (d) a proof

Q18. Assumption used throughout mathematics and not specifically linked to geometry is

(a) Theorem   b) Axiom   (c) Postulate   (d) Definition

Q19. **Assertion (A):** In the given figure, if ∠AOC + ∠BOD = 70°, then ∠COD =110°

Reason (R): AB is a straight line, so measure of angle AOB is 180°
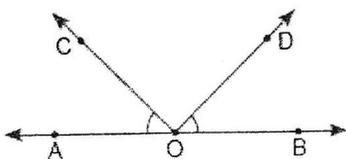
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(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

Q20. **Assertion (A):** If the sides of triangle are 8 cm, 15 cm and 17 cm, then its area is 120cm².

Reason (R): Area of triangle is $\sqrt{s(s-a)(s-b)(s-c)}$

(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.

SECTION B

Q21 Insert a rational number and an irrational number between the following: 2/3 and 5/7

Q22 Simplify: $(4\sqrt{3} - 7\sqrt{2})(3\sqrt{3} + 5\sqrt{2})$

Q23 Write whether the following statements are True or False
    (i) Point (3, 0) lies in the first quadrant.
    (ii) Points (1, −1) and (−1, 1) lie in the same quadrant.
    (iii) The coordinates of a point whose ordinate is 3 and abscissa is 1 are (1 ,3) .
    (iv) A point lies on y-axis at a distance of 2 units above the x-axis. Its coordinates are (2, 0).

Q24 Without actually calculating the cubes, find the value of
$$(28)^3 + (-15)^3 + (-13)^3$$

Q25 Expand using suitable identities: $(3a - 7b - c)^2$

<p align="center">**OR**</p>

Evaluate $(96)^2$ by using suitable identities only:

SECTION C

Q26 Find the value of a in the following:
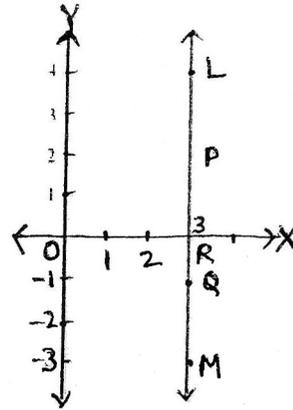$$\frac{3 - \sqrt{5}}{3 + 2\sqrt{5}} = a\sqrt{5} - \frac{19}{11}$$

<p align="center">**OR**</p>

Simplify $\sqrt[4]{81} - 8\left(\sqrt[3]{216}\right) + 15\left(\sqrt[5]{32}\right) + \sqrt{225}$

<p align="center">3</p>

Q27 In Figure LM is a line parallel to the y-axis at a distance of 3 units.

    (i) What are the coordinates of the points P, R and Q?

    (ii) What is the difference between the abscissa of the points L and M?

Q28 Side of a triangles are 120m, 170m, 250m. Find its area . Find height of triangle corresponding to base 250m

Q29 Prove that if two lines intersect each other, then the vertically opposite angles are equal.

Q30 The sides of a triangular plot are in the ratio of 3 : 5 : 7 and its perimeter is 300m. Find its area.

Q31 Find four Solution of linear equation $5x - 3y = 8$. Find value of y for x = 40

SECTION D
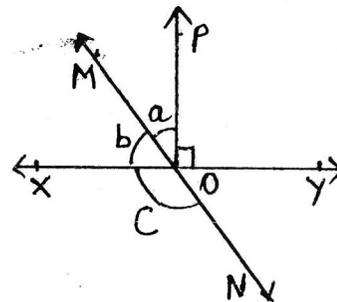
Q32 i) Express in p/q form: $0.6\overline{3}$

    ii) Find the value of

$$\frac{4}{(216)^{-\frac{2}{3}}} + \frac{1}{(256)^{-\frac{3}{4}}} + \frac{2}{(243)^{-\frac{1}{5}}}$$
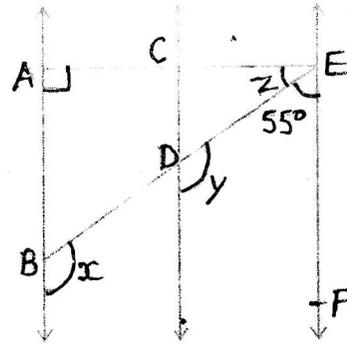
Q33 i) Factorise:

$64a^3 - 27b^3 - 144a^2b + 108ab^2$

    ii) Find the value of k, if $x - 1$ is a factor of $p(x)$

$p(x) = kx^2 - \sqrt{2}x + 1$

Q34 i) In Fig. , lines XY and MN intersect at O. If $\angle POY = 90°$ and $a : b = 3 : 7$, find c.

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ii) In Fig. AB || CD and CD || EF. Also, EA ⊥ AB. If ∠ BEF = 55°, find the values of x, y and z.

Q35 In a city, number of cars passing through a road and their respective speeds are given in the following table. Draw a histogram to represent the same.

Speed (km/h)	Frequency
30 – 40	3
40 – 50	6
50 – 60	25
60 – 70	65
70 – 80	50
80 – 90	28

SECTION E

Q36 PM CARES FUND: PM Cares Fund is aimed at strengthening the fight against Covid-19. It will further encourage the availability of quality treatment and research on ways to beat coronavirus. The contribution made by people is used in solving challenges of the present and protecting the future. Two friends Sheela and Nirmala together contributed Rs2000 towards this fund. Let Sheela contributed x and Nirmala contributed y

(a) How can the above situation be represented by an equation?
  (i) xy = 2000   (ii) x + y = 2000   (iii) x = 2000 + y   (iv) y = 2000 + x

(b) If Sheela contributed Rs 50 more than Nirmala , then it can be represented as
  i)   X+50y=2000   (ii) x-y=50   (iii) x+50=y   (iv) 50x+y=2000

(c) Next month Sheela contributed thrice the contribution made by Nirmala. The possible solution is
 i)   (1500,500)   ii) (500,1500)   iii) (400,1200)   iv) (1600,400)

(d) If the contribution of Sheela and Nirmala are in the ratio 4:1 .Find the contribution of Nirmala

Q37 In a particular section of Class IX, 40 students were asked about the months of their birth and the following graph was prepared for the data so obtained:
Observe the bar graph given above and answer the following questions:
  (i)   How many students were born in the month of November?
  (ii)   In which month were the maximum number of students born?
  (iii)   How many more students were born in October than June?

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(iv)   Find total number of students born in last quarter of year.

Months of Birth ⟶
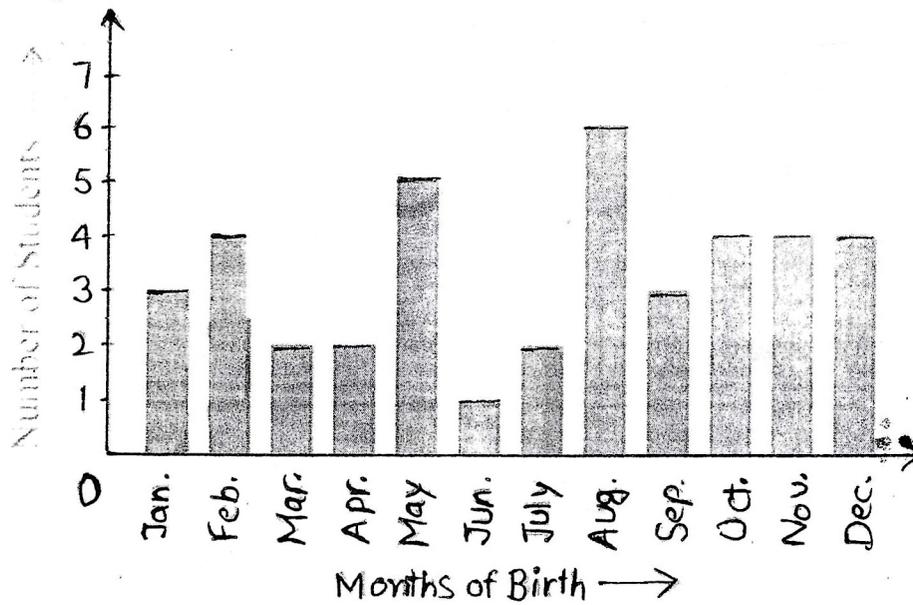
Q38   Rajan, a milkman, sells cow milk at the rate of Rs 50 per litre, buffalo milk at the rate of Rs 60 per litre. And goat milk at the rate of Rs 70 per litre. The quantity of buffalo milk is equal to square of the cow milk. He sells 10 litres of goat milk everyday. If he sells x litres of cow milk, then

a) how much milk does Rajan sell in all? (write algebraic expression)
   i) $x^2 - x + 10$ ii) $x^2 + x + 10$ iii) $x^2 + 2x + 20$ iv) $x^2 + 2x + 10$

b) Express total cost of milk algebraically.
   i) $50x^2 + 60x + 700$ ii) $60x^2 + 50x + 700$ iii) $60x^2 + 50x + 70$

c) On a particular day, if Rajan sells 25 litres of Buffalo milk , then find total quantity of whole milk sold on that day. Also find the total sale in Rs.

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