DAV BR PUBLIC SCHOOL, BINA
PRACTICE PAPER SESSION 2023-24

Class IX   **Subject: MATHEMATICS**

Time Allowed 3 HRS   **MM: 80**

General Instructions: 1. This question paper contains five sections A, B, C, D and E. Each section is compulsory.

Section - A carries 20 marks weightage, Section - B carries 10 marks weightage, Section - C carries 18 marks weightage, Section - D carries 20 marks weightage and Section - E carries 3 case-based with total weightage of 12 marks.

Section – A: 3. It comprises of 20 MCQs of 1 mark each.

Section – B: 4. It comprises of 5 VSA type questions of 2 marks each.

Section – C: 5. It comprises of 6 SA type of questions of 3 marks each.

Section – D: 6. It comprises of 4 LA type of questions of 5 marks each.

Section – E: 7. It has 3 case studies. Each case study comprises of 3 case-based questions, where 2 VSA type questions are of 1 mark each and 1 SA type question is of 2 marks. Internal choice is provided in 2 marks question in each case-study. 8. Internal choice is provided in 2 questions in Section - B, 2 questions in Section – C, 2 questions in Section - D. You have to attempt only one of the alternatives in all such questions.

SECTION - A

1   A rational number between $\sqrt{2}$ and $\sqrt{3}$ is   **1**

    (a) $\frac{\sqrt{2}+\sqrt{3}}{2}$ (b) $\frac{\sqrt{2}.\sqrt{3}}{2}$ (c) 1.5   (d) 1.8

2   The number obtained on rationalising the denominator of $\frac{1}{\sqrt{7}-2}$ is   **1**

    (a) $\frac{\sqrt{7}+2}{3}$ (b) $\frac{\sqrt{7}-2}{3}$ (c) $\frac{\sqrt{7}+2}{5}$ (d) $\frac{\sqrt{7}+2}{45}$

3   The degree of the polynomial $4x^4 + 0x^3 + 0x^5$ is   **1**

    (a) 0   (b) 4   (c) 3   (d) 5

4.   If y coordinate of a point is zero, then this point always lies   **1**

    (a) in I quadrant   (b) in II quadrant   (c) on x - axis   (d) on y - axis

5.   How many linear equations in x and y can be satisfied by x = 5 and y = 7?

    (a) Only one   (b) two   (c) infinitely many   (d) three   **1**

6.   Abscissa of all the points on y-axis is

    (a) 0   (b) 1   (c) 2   (d) any number   **1**

7. $2\sqrt{3} + \sqrt{3}$ is equal to   **1**

    (a) $2\sqrt{6}$ (b) 6   (c) $3\sqrt{3}$ (d) $4\sqrt{6}$

8.   The complement of 65^0 is   **1**

(a) 15^0 (b) 25^0 (c) 115^0 (d) 125^0

9. Which of the following is a criterion for congruence of triangles ?   1

   (a) SAS   (b) ASA   (c) SSA   (d) (a) and (b)

10. In triangles ABC and PQR, if $\angle A = \angle R, \angle B = \angle P$ and BC = QR. The two triangles will   1
be congruent by axiom

   (a) SAS   (b) ASA   (c) SSS   (d) RHS

11. If the opposite angles of a quadrilateral are bisected by two diagonals, then it must be   1

   (a) rectangle   (b) parallelogram   (c) trapezium   (d) square

12. If angles A, B, C and D of the quadrilateral ABCD, taken in order, are in the ratio 3:7:6:4,   1
then ABCD is a

   (A) rhombus   (B) parallelogram   (C) trapezium   (D) kite

13. AD is a diameter of a circle and AB is a chord. If AD = 34 cm, AB = 30 cm, the distance   1
of AB from the centre of the circle is :

   (A) 17 cm   (B) 15 cm   (C) 4 cm   (D) 8 cm

14. If two diameters of a circle intersect each other at right angles, then the quadrilateral   1
obtained by joining their end points is

   (a) square   (b) rectangle   (c) parallelogram   (d) rhombus

15. If 2r is the radius and h is the height of a cylinder, then its volume will be   1

   (a) $2\pi rh$ (b) $\pi r^2 h$ (c) $4\pi r^2 h$ (d) $2\pi r^2 h$

16. In a frequency distribution, the mid value of a class is 10 and the width of the class is 6.   1
The lower limit of the class is

   (a) 6   (b) 7   (c) 8   (d) 12

17. In the class intervals 10 – 20 , 20 – 30 , the number 20 is included in   1

   (a) 10 – 20   (b) 20 – 30   (c) Both the intervals   (d) None of these

18. POQ is a line. The value of x is   1

   (a) 20° (b) 25° (c) 30° (d) 35°
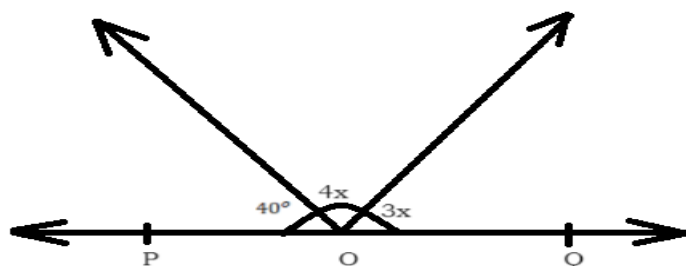
For questions 19 and 20, two statements are given – one labelled Assertion(A) and the
other labelled Reason (R). Select the correct answer to these questions from the codes (i),
(ii), (iii) and (iv) as given below:

   (i)   Both A and R are true and R is the correct explanation of the assertion

   (ii)   Both A and R are true but R is not the correct explanation of the assertion

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(iii)   A is true, but R is false

(iv)   A is false, but R is true

19.   **Assertion (A):** the value of 'k' for which the polynomial (x – 3) is a factor of the   **1**
polynomial $x^3 - x^2 - kx - 3$ is 5.

Reason R : if (x – a) is a factor of the polynomial f(x), then f(-a) = 0.

(a) (i)   (b) (ii)   (c) (iii)   (d) (iv)

20.   **Assertion (A) :** the sides opposite to equal angles of a triangle are not equal.   **1**
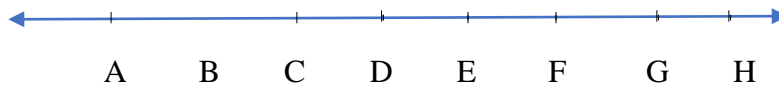
Reason (R): angle opposite to equal sides of a triangle are equal.

a) (i)   b) (ii)   c) (iii)   d) (iv)

SECTION – B

(All questions are compulsory. In case of internal choice, attempt any one question only)

21.   If $a^2 + b^2 + c^2 = 19$ and ab + bc + ca = 15, find the value of a + b + c.   **2**

22.   Plot the points (7, 7), (-6, -6), (-2, -3) on the graph paper. Are they collinear?   **2**

23.   In the given fig. show that length AH > sum of lengths of AB + BC+ CD.   **2**

A   B   C   D   E   F   G   H

24.   Find the area of a triangle whose perimeter is 180 cm and its two sides are 80 cm and 18   **2**
cm.

25.   Curved surface area of a cone is 308 cm^2 and its slant height is 14 cm. find radius of base   **2**
and total surface area of the cone.

SECTION – C

26.   If $a = \sqrt{3} + 1$, find the value of $a^4 + \frac{1}{a^4}$
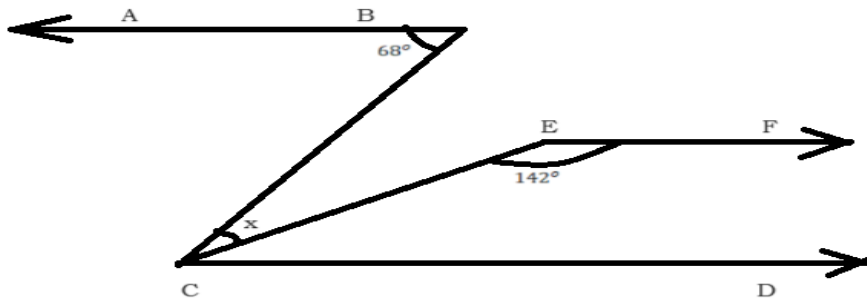
OR   **3**

Find the values of a and b if $\frac{3+2\sqrt{2}}{3-\sqrt{2}}$ = a + b$\sqrt{2}$

27.   If $x = -\frac{1}{3}$ is a zero of the polynomial p(x) = $27x^3 - ax^2 - x + 3$, find the value of a   **3**

OR

Factorise: $a^3(b - c)^3 + b^3(c - a)^3 + c^3(a - b)^3$

28.   If the points (0, 2) and (3,0) satisfy a linear equation y = mx + c then consider the linear

equation in the form ax +by +c = 0   **3**

29.   In fig. AB ∥ CD ∥ EF. Find the value of x.

3

30. ABC is an isosceles triangle with AB = AC and BD and CE are its two medians. Show that BD = CE. **3**

OR

ABC is a right triangle with AB = AC. Bisector of ∠A meets BC at D. Prove that BC = 2 AD.

31. Find the area of a triangle whose perimeter is 180 cm and its two sides are 80 cm and 18 cm. calculate the altitude of triangle corresponding to its shortest side. **3**

SECTION - D

32. The polynomial p(x) = x^4 - $2x^3$ + $3x^2$ - ax + b, when divided by (x − 1) and (x + 1), leaves the remainders 5 and 19 respectively. Find the values of a and b. hence, find the remainder when p(x) is divided by (x − 3). **5**

33. Prove that the quadrilateral formed by the bisectors of the angles of a parallelogram is a rectangle. **5**

OR

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

34. A circular part of radius 20 m is situated in a colony. Three boys Ankur, Syed and David are sitting at equal distances on its boundary each having a toy telephone in his hands to talk each other. Find the length of the string of each phone. **5**

35. The paint in a certain is sufficient to paint an area equal to 9.375 m^2. How many bricks of dimensions $22.5 \times 10\ cm \times 7.5\ cm$ can be painted out of this container? **5**

SECTION - E

36. Ajay is on a road trip in his car. He start his trip on a road at point A and covers a distance of $\left(x^3 + \frac{1}{x^3}\right)$ km in the first lap and reaches the destination B. then he comes back on the same road for a distance of $5\left(x^2 + \frac{1}{x^2}\right)$ km to reach the destination C. then he again return back on the same road covering a distance of $\left(x + \frac{1}{x}\right)$ km to reach his destination D. if the journey in the direction of AB is taken as positive and x = $\frac{5 + \sqrt{21}}{2}$ km then answer the following questions based on this information. **4**

(a) how much distance did he travel in the third trip?

(b) how much distance he cover in his first trip?

(c) what is the total distance travelled b Ajay in this trip?

37. In a school canteen, pizza and burgers are available as refreshment. Sumit purchased two **4**

pizza and one burger and paid ₹250.

(a) form the linear equation.

(b) find the solution of above equation.

(c) how many solution are possible for this equation?

38. Family income can not be considered the only determinant of how individuals prove them **4**
selves, but it has a profound impact on physical, mental and social well-being. A family
with a monthly income of ₹28000 had planned the following expenditure per month under
various heads :

heads	Expenditure(in thousand rupees)
Rent	4
Grocery	6
Education on children	5
Medicine	2
Fuel	2
Entertainment	1
Saving	4
Miscellaneous	4

Stud the data given above and answer the following questions :

(a) what does the number against each head represent?

(b) state the amount of expenditure occur by the family in the entertainment head?

(c) in which head expenditure is triple that of medical expenses?