GURU HARKRISHAN PUBLIC SCHOOL

(Running under the aegis of GHPS Society)

Half Yearly Examintaion/Term 1

SESSION: (2024-25)

SUBJECT- MATHEMATICS(STANDARD)

CLASS- IX

TIME ALLOWED: 3Hrs **M. M: 80**

General Instructions:

1. All questions are compulsory however internal choice is provided.
2. This question paper contains of 38 questions divided into **five sections -A,B,C,Dand E.**
3. **Section - A** comprises of **18 MCQ's and 02 Assertion -Reason based questions of one mark each.**
4. **Section - B** comprises of **05 Very Short Answer (VSR) type questions of 2 marks each.**
5. **Section - C** comprises of **06 Short Answer(SA) type questions of 3 marks each.**
6. **Section - D** comprises of **04 Long Answer (LA) type questions of 5 marks each.**
7. **Section - E** comprises of **03 source based/Case based/passage based question** of **4 marks each** with sub-parts.

SECTION – A

Q1 Every rational number is a

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

Q2 The value of polynomial $5x - 4x^2 + 3$, when $x = -2$ is

(a) 2 (b) -14 (c) 26 (d) – 23

Q3 In which quadrant the point (4,-2) lie

(a) I quadrant (b) IV quadrant (c) II quadrant (d) III quadrant

Q4 If (2,0) is the solution of the linear equation $2x + 3y = m$, then the value of m is

(a) 2 (b) 4 (c) 6 (d) 3

Q5 Number of points that a line contain be

(a) two (b) one (c) infinite (d) zero

Q6 The complement angle of 48° is

(a) 62° (b) 42° (c) 61° (d) 46°

Q7 In ΔABC, $AB = AC$ and $\angle A = 80°$. Then $\angle C$ is equal to

(a) 50° (b) 100° (c) 80° (d) 40°

Q8 'Lines are parallel if they do not intersect' is stated in the form of a

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

Q9 If $x^{41} + 42$ is divided by $x+ 1$, the remainder is

(a) 0 (b) 1 (c) 42 (d) 41

Q10 The sum of $(\sqrt{5} - 3) + (-\sqrt{5} + 7) =$

(a) 3 (b) - 4 (c) 4 (d) $2\sqrt{5} + 4$

Q11 In ΔABC, $\angle A + \angle B = 80°$ and $\angle B + \angle C = 125°$, Then the measure of $\angle B$ is :

(a) 70° (b) 105° (c) 60° (d) 25°

Q12 The value of $(9)^{\frac{3}{2}} + (25)^{\frac{1}{2}}$

(a) 32 (b) 34 (c) 14 (d) 31

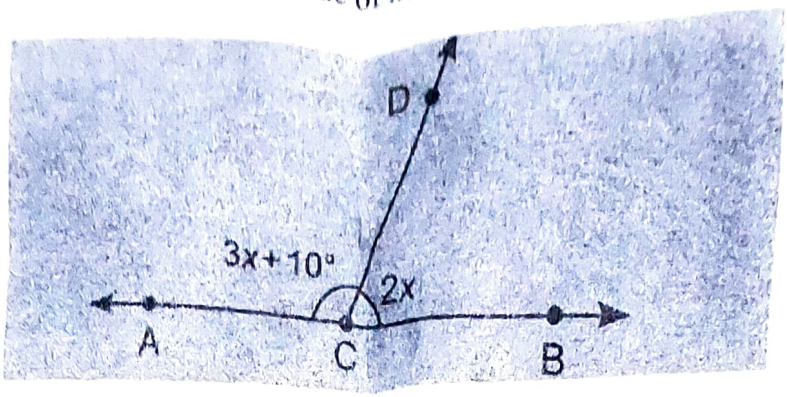
Q13 Which of the following polynomial is a linear polynomial ?

(a) $2x^3 + 3x - 7$ (b) $4x - 7$ (c) $6x^2 - 5x + 3$ (d) $3 - \sqrt{5}$

Q14 Which of the points P(0,3) ,Q(1,0) , R(0,-1) , S (-5,0) , T(1,2) do not lie on x-axis?

(a) P and R (b) Q and S (c) P,R and T (d) Q,S and T

Q15 In fig: ACB is a line. Then the value of x is



(a) 70° (b) 15° (c) 64° (d) 34°

Q16 Any point on the line y = x is of the form

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

Q17 When $x^4 + x^3 - 2x^2 + x + 1$ is divided by x-1 , then the remainder is

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

Q18 The rational number between 2 and 3 is

(a) 2.010010001..... (b) $\sqrt{5} - 1$ (c) $\frac{5}{2}$ (d) $\sqrt{6}$

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 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.

Q19 Assertion (A): If $\angle A = 40°$ and $\angle B = 70°$, then $\angle A + \angle B = 110°$

Reason (R) : If equal are added to the equals, wholes are equal.

Q20 Assertion (A) : If a = 35° , b = 155° , then angles 'a' and 'b' form a linear pair of angles.

Reason (R) : The sum of the linear pair is always 180°.

SECTION – B

Q21 In figure; If AC = BD , then prove that AB = CD

Q22 Factorize : $27p^3 - \frac{1}{216} - \frac{9}{2}p^2 + \frac{1}{4}p$

Q23 Express the linear equation x = 3y – 8 in the form of ax + by + c = 0 and thus find the value of a, b and c.

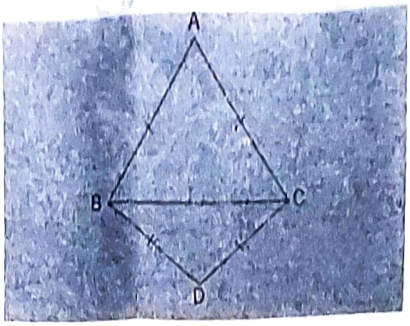
OR

Write equation of one line passing through point (3,5). How many solutions can this linear equation have?

Q24 In ΔABC, AD is perpendicular bisector of BC. Show that ΔABC is an isosceles triangle in which AB = AC.

OR

ABC and DBC are two triangles on the same base BC. Show that $\angle ABD = \angle ACD$.



Q25 Write the difference of the ordinates of the points (-3,7) and (8, -9)?

SECTION – C

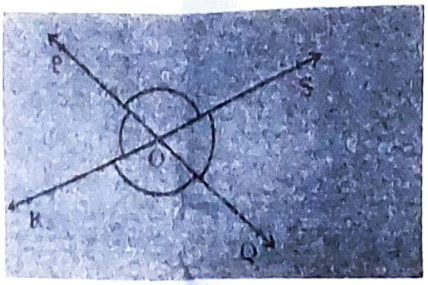
Q26 Express $0.2\overline{35}$ in the $\frac{p}{q}$ form , where p and q are integers and $q \neq 0$.

OR

Find the value of x : $\left(\frac{3}{5}\right)^6 \times \left(\frac{5}{3}\right)^{-9} = \left(\frac{3}{5}\right)^{3x}$

Q27 Factorise : $x^3 - 3x^2 - 9x - 5$

Q28 In fig; lines PQ and RS intersect each other at point O. If $\angle POR : \angle ROQ = 5 : 7$, find all angles.



Q29 If (3,1) is the solution of equation $x + 4y = p$, then find the value of p. Also find two more solutions.

Q30 Write $(-2x + 5y + 3z)^2$ in the expanded form.

OR

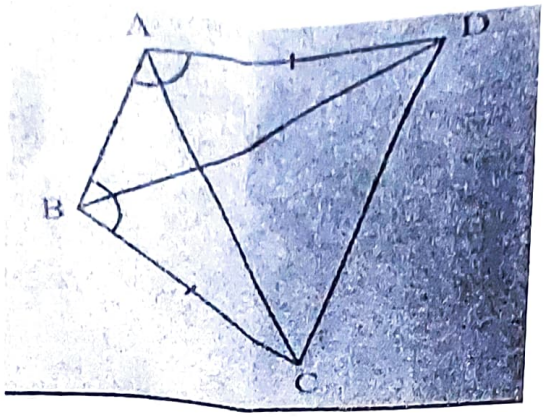
If $x + y = 10$ and $xy = 21$, find the value of $x^3 + y^3$.

Q31 ABCD is a quadrilateral in which AD = BC and $\angle DAB = \angle CBA$.

Prove that (i) $\Delta ABD \cong \Delta BAC$

(ii) BD = AC

(iii) $\angle ABD = \angle BAC$



SECTION – D

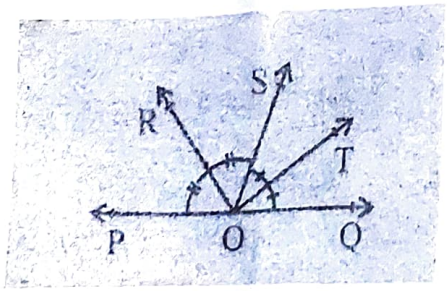
Q32 Find the value of a and b if, $\frac{3+\sqrt{2}}{3-\sqrt{2}} = a + b\sqrt{2}$

Q33 If $p(x) = x^3 + 3x^2 - 2x + 4$, find the value of $p(-2) + p(1) + p(0)$.

OR

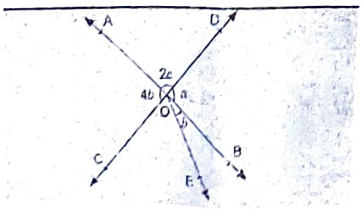
If -2 and 2 are the zeroes of the polynomial $p(x) = ax^4 + 2x^3 - 3x^2 + bx - 4$, find the values of a and b.

Q34 In fig; ray OS stands on a line POQ. Ray OR and ray OT are angles bisectors of $\angle POS$ and $\angle SOQ$, respectively. If $\angle POS = x$, find $\angle ROT$.

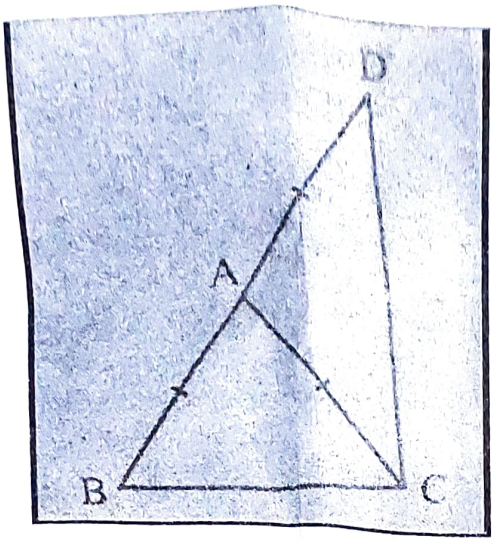


OR

In fig; two straight lines AB and CD intersect each other at O. If $\angle COE = 70°$, Find the values of a, b and c.



Q35 ΔABC is an isosceles triangle in which $AB = AC$. Side BA is produced to D such that $AD = AB$. Show that $\angle BCD$ is a right angle.

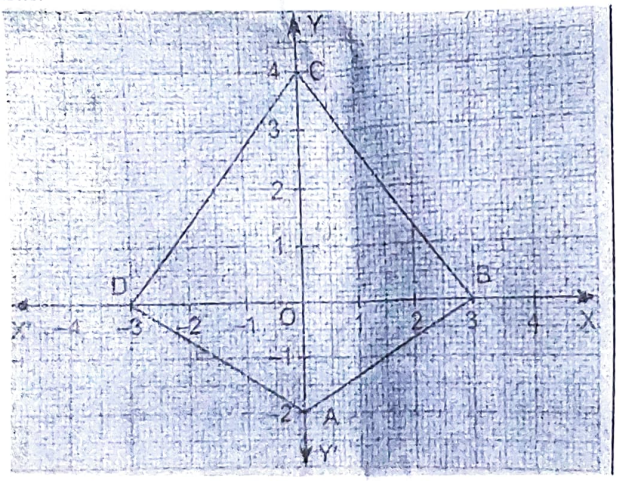


SECTION – E

(This section comprises of **03 source based/Case based/passage based question** of **4 marks each** with sub-parts. Case study questions have three sub-parts (i), (ii), & (iii) of marks 1,1,2 respectively).

Q36 **Case-Study - 1:**

Amar draws a Kite ABCD on cartesian plan as shown. He shows his drawing to Rahul.



Using above graph answer the following questions:

(i) What are the abscissas of A and B respectively?

(ii) What are the ordinates of C and D respectively?

(iii) What are the coordinates of A and B respectively?

OR

Find the length of diagonals AC and BD?

Q37 **Case-Study - 2:**

A shopkeeper sells two types of rice, Brown Rice (BR) and Golden Sella Rice (GSR). Total quantity of rice he had in the beginning of the week is one thousand Kg. He bought BR at the rate of rupees 75 per Kg and GSR

at the rate of rupees 25 per Kg. His total purchase Rs 56250.
Assume that shopkeeper bought x Kg of BR and y Kg of GSR and answer the following questions:

(i) Write the linear equation that represents the quantity of rice(in Kg) the shopkeeper has in the beginning.

(ii) Write the linear equation that represents the total amount to purchase both types of rice.

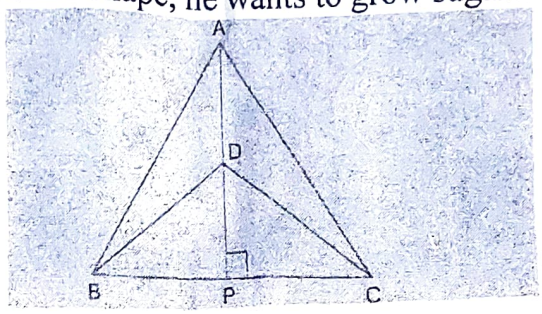
(iii) If the point (2k-3,k+2) lies on the line $2x + 3y + 15 = 0$, then what is the value of k?

OR

If the shopkeeper purchase 545 Kg of GSR. How much money he spend?

Q38 **Case-Study - 3:**

A farmer in his triangular field, want to grow wheat, rice, sugarcane and cotton. He divides his field in four parts (as shown in figure). He wants to grow wheat and rice in triangles of exactly same shape and similarly in two triangles of same shape, he wants to grow sugarcane and cotton.



Answer the following questions:

(i) In which triangle farmer will grow wheat if he grows rice in triangle ABD?

(ii) Which triangle farmer will choose to grow cotton and sugarcane ?

(iii) Explain the congruency criteria for any two triangles, in the given figure.

OR

If $\angle A = 90°$,then find $\angle B$ and $\angle C$.

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