विद्या सर्वार्थि साधिका

ANANDALAYA

PERIODC TEST – 2

Class: IX

Subject: Mathematics M.M :80

Date : 19/09/2022 Time : 3 Hours

General Instructions:

1. This question paper contains two parts A and B.
2. Both Part A and Part B have internal choices.

Part – A:

1. It consists of two sections- I and II
2. Section I has 16 questions. Internal choice is provided in 5 questions.
3. Section II has four case study-based questions. Each case study has 5 case-based sub-parts. An examinee is to attempt any 4 out of 5 sub-parts.

Part – B:

1. Question No 21 to 26 are Very short answer Type questions of 2 mark each,
2. Question No 27 to 33 are Short Answer Type questions of 3 marks each
3. Question No 34 to 36 are Long Answer Type questions of 5 marks each.
4. Internal choice is provided in 2 questions of 2 marks, 2 questions of 3 marks and 1 question of 5 marks.

PART – A

SECTION - I

1. Simplify;$y = \frac{2^{30}+2^{29}}{2^{31}-2^{30}}$, then find value of y – 1. (1)

OR

What is the product of $\frac{1}{6}\sqrt{18}$ *and* $\frac{1}{3}\sqrt{18}$?

2. Euclid stated that 'if equals are subtracted from equals, the remainders are equals' in the form of ? (1)

3. If P (– 2, 2), Q (3, – 5), R (2, – 2), S (– 3, – 4), and T (– 6, 3) are plotted on the graph paper, then the point(s) Which are the points lies in fourth quadrant? (1)

4. Write the coefficient of x^3 *in* $\frac{-x^5+21x^3+5x}{-2}$. (1)

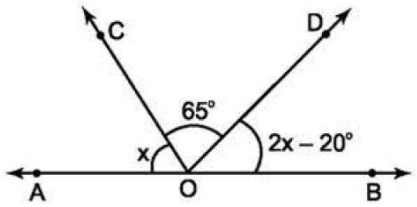
5. Find the coordinates of the point on the graph of the linear equation 2x + 5y = 19, whose ordinate is 1½ times its abscissa. (1)

OR

'Twice the ordinate of a point decreased by three times the abscissa is 6.' Express, the given sentence expressed in the standard equation form.

6. The surface has _____ (number of) dimensions. (1)

7. In the adjoining figure, AOB is a straight line, Find ∠AOC. (1)

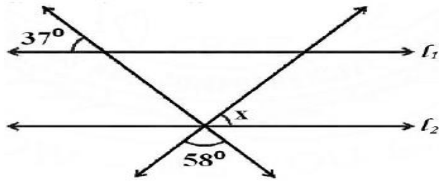


OR

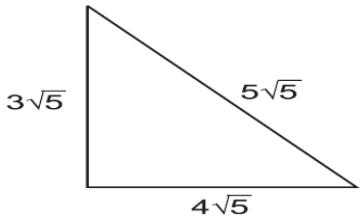
If the angles (4p + 4°) and (5p - 4°) are complementary angles, Then find p.

8. If (4, 19) is a solution of the equation y = px + 3, then find the value of p. (1)

9. In figure, if $l_1 \parallel l_2$, what is the value of x. (1)



10. Calculate the perimeter of the given figure. (1)



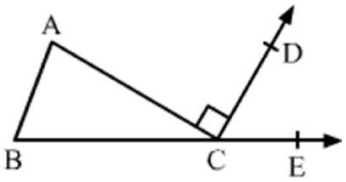
11. If x is an angle which is five times its supplement angle, then what is the value of x? (1)

12. In ΔABC, BC = AB, and ∠B = 80° then find the measure of ∠A. (1)

13. What is the product of the x – intercept and y-intercept of the line y = x + 5. (1)

14. If x + 1 is a factor of $ax^3 + x^2 - 2x + 4a - 9$, then find the value of a. (1)

15. In a ΔABC, it is given that ∠A :∠B : ∠C = 3 : 2 : 1 and ∠ACD = 90°. If BC is produced to Ethen find ∠ECD. (1)



OR

In a ΔABC, if ∠A − ∠B = 42° and ∠B − ∠C = 21° then calculate the measure of angle B.

16. Write the coordinates of a point which is 8 units away from the x-axis and lies on the negative direction of the y-axis. (1)

OR

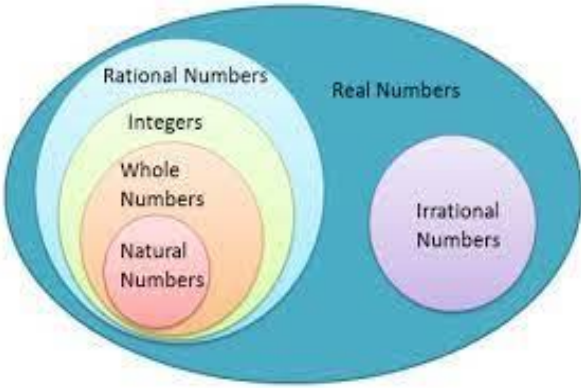
The verbal sentence 'The difference of the ordinate and abscissa of a point is 1' is represented in equation form.

Section-II

Case study-based questions are compulsory. Attempt any four sub parts of each question. Each subpart carries 1 mark

17. Case study – 1 (4)

Real numbers are combination of rational and irrational numbers. Rational numbers can be written in the form a/b, where a and b are integers and b ≠ 0. Rational numbers are either terminating or non-terminating repeating. Irrational numbers are those numbers which cannot be written in the form a/b. Irrational numbers are non-terminating non repeating.



Now answer the following:

(A) Every rational number is _____.

(i) A natural number (ii) A whole number (iii) An integer (iv) a real number

(B) The product of two irrational numbers is _____.

(i) always rational (ii) always irrational

(iii) always an integer (iv) sometimes rational and sometimes irrational

(C) Between two irrational number _____.

(i) there is one rational number (ii) there is no rational number

(iii) there are infinity many rational numbers (iv) there is no irrational number

(D) Which of the following is an irrational number?

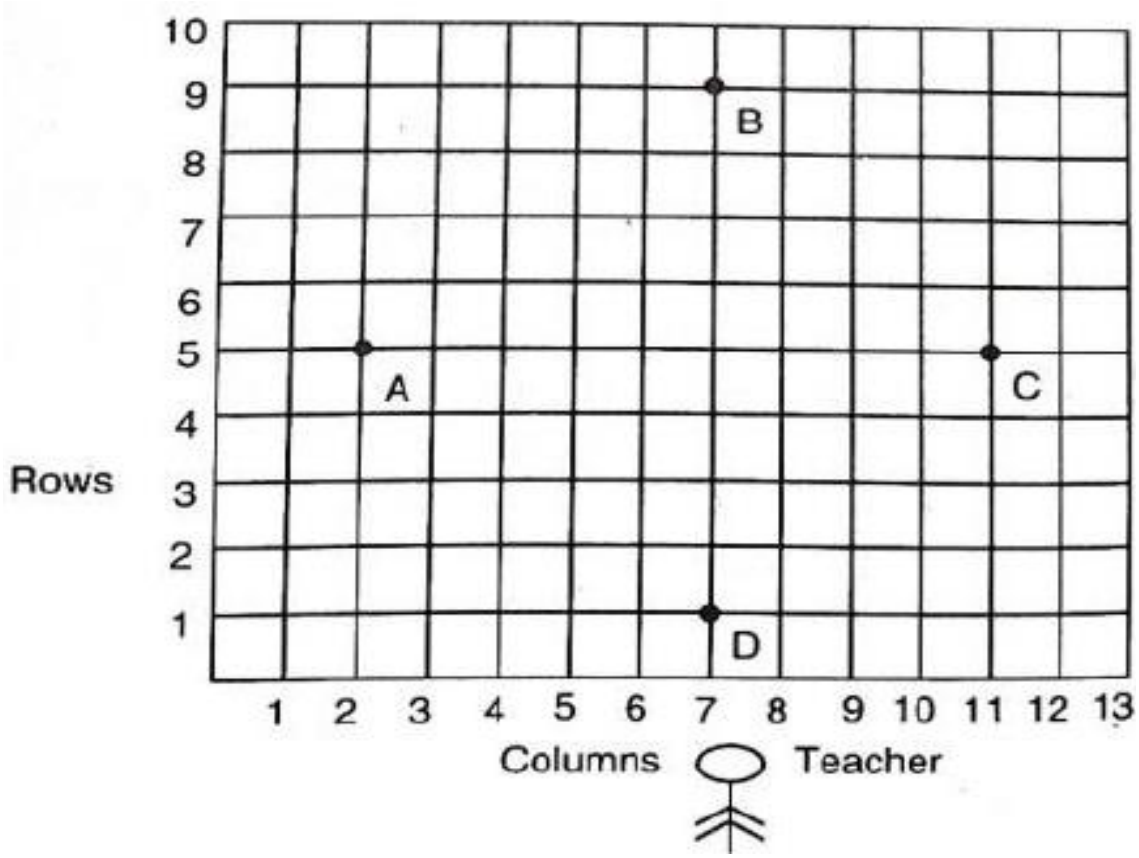
(i) 22/7 (ii) 3.141414… (iii) π (iv) 3.2757575…..

(E) The sum of rational and irrational number is _____.

(i) irrational (ii) rational (iii) A and B both (iv) none of these.

18. Case Study – 2 (4)

Coordinate geometry is a branch of geometry which sets up a definite correspondence between the position of a point in a plane and a pair of algebraic numbers, called co-ordinates. It has been developed as an algebraic tool for studying the geometry of objects. Students of a school are standing in rows and columns in their playground for a drill practice. A, B, C and D are the positions of four students as shown in figure.



(A) The coordinates of point A are _____

(i) (5,2) (ii) (0,5) (iii) (2,5) (iv) (3,5)

(B) The distance of B from x-axis is _____.

(i) 7 (ii) 9 (iii) 8 (iv) None of these

(C) Ordinate of D _____.

(i) 1 (ii) 6 (iii) 0 (iv) 7

(D) Abscissa of C is _____.

(i) 12 (ii) 5 (iii) 9 (iv) 11

(E) Area of the figure obtained by joining the points A, B, C and D _____.

(i) 36 (ii) 18 (iii) 72 (iv) None of these

19. Case Study – 3 (4)

The Axioms and Postulates are the assumptions which are obvious universal truths, they are not proved. Euclid, a teacher of Mathematics worked extensively on it. Same of his famous axioms are:

(i) Things which coincide with one another are equal to one another.

(ii) If equals are subtracted from equals the remainders are equals.

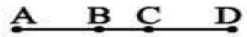
(iii) If equals are added to equals, the wholes are equal.

Now answer the following:

(A) If P, Q and R are three points and Q is between P and R, then:

(i) PQ – QR = PR (ii) PQ + QR = PR (iii) PQ – QR = PR (iv) PQ – PR = QR

(B) In the given figure if AC = BD, then:



(i) AB = CD (ii) AC = BC (iii) CD = BC (iv) AB = BC

(C) If a + b = 20 then a + b + c = _____.

(i) 20 – c (ii) 20 ÷ c (iii) 20 + c (iv) 10 + c

(D) If x – 5 = 10, then by using Euclid's axioms, find the value of x.

(i) 10 (ii) 12 (iii) 14 (iv) 15

(E) Euclid divided his famous treatise. The Elements' into:

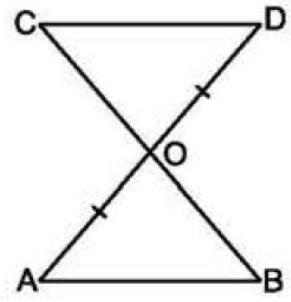
(i) 10 chapters (ii) 11 chapters (iii) 12 chapters (iv) 13 chapters

20. Case study – 4 (4)

Mrs. Rashmi, class – IX maths teacher, drew a figure on the board in the class and provided the following information to the students.

- AB || CD
- O is the mid-point of AD

Then asked the following questions to students.



(A) ΔAOB ≅Δ DOC by which congruent condition?

(i) ASA (ii) SAS (iii) SSS (iv) RHS

(B) Which of the following is correct?

(i) ∠A = ∠ B (ii) ∠A = ∠ C (iii) ∠A = ∠ D (d) ∠AOB = ∠ ABO

(C) ∠AOB = ∠ DOC holds because:

(i) Corresponding angles are equal (ii) Alternate interior angles are equal

(iii) Alternate exterior angles are equal (iv) Vertically opposite angles are equal

(D) The correct statement is:

(i) AO = DC (ii) OB = OD (iii) AB = OD (iv) OB = OC

(E) Which of the following is not a congruent criterion?

(i) ASA (ii) SAS (iii) AAA (iv) SSS

Part –B

All questions are compulsory. In case of internal choices, attempt any one.

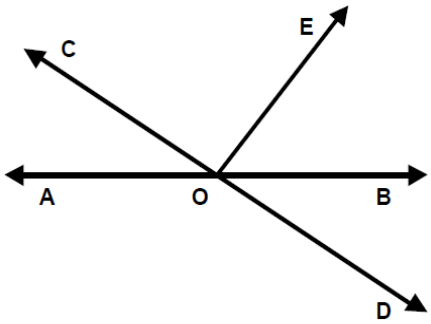
21. Find the three rational number between $\frac{5}{7}$ *and* $\frac{6}{7}$. (2)

22. Prove that ever line segment has one and only one mid – point. (2)

OR

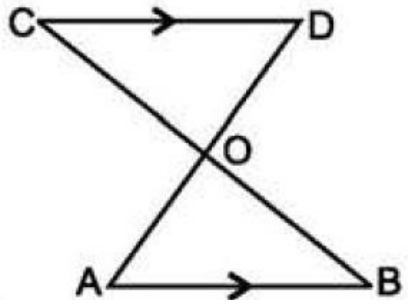
In the given figure, if PS = RQ, then prove that PR = SQ.

23. In fig. AB and CD intersect each other at O. If ∠AOC + ∠BOE = 70° and ∠BOD = 40 ° then find thevalue of ∠BOE. (2)



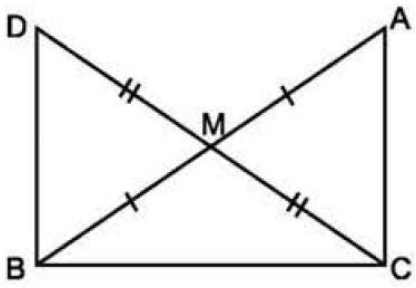
24. Which number to be added to the polynomial $x^2 - 5x + 4$, so that 3 becomes its zero? (2)

25. In the figure, AB||CD. O is the mid-point of BC. Prove that O is also the mid-point of AD. (2)



OR

In right 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 (see figure).
Show that:
(i) ΔAMC = ΔBMD
(ii) ∠DBC is a right angle.



26. If (2p – 1, p) is a solution of the equation 9y + 12 = 10x, then calculate the value of p. (2)

27. Without plotting the points indicate the quadrant in which they will lie, if (3)
(a) Ordinate is '– 5' and abscissa is '– 3'.
(b) Ordinate is '– 4' and abscissa is '6'
(c) abscissa is '– 4' and ordinate is '8'.

28. Verify whether the values of x = 1, 2, 3 are zeroes of the polynomial (3)

$$p(x) = x^3 - 6x^2 + 11x - 6.$$

OR

Using suitable identity and factorise: $\left(2x + \frac{1}{3}\right)^2 - \left(x - \frac{1}{2}\right)^2$.

29. Find the value of 'a' in the following: $\frac{6}{3\sqrt{2} - 2\sqrt{3}} = 3\sqrt{2} - a\sqrt{3}$. (3)

30. Write the answer of each of the following questions: (3)

(i) What is the name of horizontal and the vertical lines drawn to determine the position of any point in 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.

OR

In which quadrant or on which axis does each of the following points lie?

A (–2, 4), B (7, –5), C (8, 0), D (5, 5), E (– 2, – 8), F (0, – 9)

31. The taxi fare in a city is as follows: (3)

For the first kilometre, the fare is ₹ 8 and for the subsequent distance is ₹5 per km.Consider distance covered as x the and total fare as ₹ y. Form the linear equation for the above condition. If a person travels 20 km then how much amount to be paid by person?

32. If $a + b + c = 5$ and $ab + bc + ca = 10$, then prove that $a^3 + b^3 + c^3 - 3abc = -25$. (3)

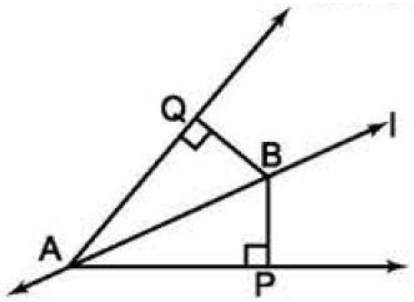
33. Line $l$is the bisector of an angle ∠A and B is any point on l. (3)

BP and BQ are perpendicular from B to the arms of ∠A as shown in figure.

Show that

(i) ΔAPB ≅ΔAQB

(ii) B is equidistant from arms of ∠A.



34. If the temperature of a liquid can be measured in Kelvin units as x° K or in Fahrenheit units as y° F, the relation between the two systems of measurement of temperature is given by the linear equation $y = \frac{9}{5}(x - 273) + 32$. (5)

(i) Find the temperature of the liquid in Fahrenheit if the temperature of the liquid is 313° K.

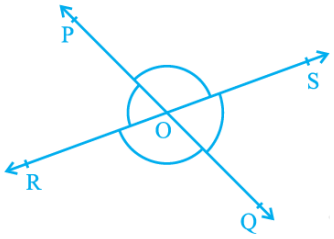
(ii) If the temperature is 158° F, then find temperature in Kelvin.

OR

Check by substituting whether x = - 6 and y =3 is a solution of quation $2(x - 1) - 5y = 1$or not. Find two more solution. How may more solutions can you find?

35. (A) Prove that, If two lines intersect each other, then the vertically oppositeangles are equal. Using this solve that following question: (5)

(B) In the adjoining figure, lines PQ and RSintersect each other at point O. If POR : ROQ = 5 : 7, find all the angles.



36. In the given adjoining figure, RS= QT and QS =RT. (5)

Prove thatPQ=PR.