MANAVA BHARATI

CLASS IX : MATHEMATICS
MID TERM ASSESSMENT
SESSION: 2024-25

Name _____   Roll No. _____

Welghtage: 80 marks.
Time Duration: 3hr.

General Instructions:

1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectiyely.
7. All Questions are compulsory.
8. Draw neat figures wherever required.

SECTION A

1. $80 \div 4\sqrt{5}$ is equal to:

   a) $10\sqrt{5}$ b) $2\sqrt{5}$ c) $4\sqrt{5}$ d) None of these

2. If $\sqrt{3}=1.73$ and $\sqrt{2}=1.414$ Find the value of $\dfrac{1}{(\sqrt{3}-\sqrt{2})}+\dfrac{1}{(\sqrt{3}+\sqrt{2})}$

   a) 3.17   b) 0.29   c) $\sqrt{1}$ d) None of these

3. The value of $\sqrt{2}$ times $\sqrt{40}$ is equal to

   a) $10\sqrt{3}$ b) $20\sqrt{2}$ c) $4\sqrt{5}$ d) None of these

4. The value of $p(m) = 4-m-4m^2+m^3$ when $m=0$ is

   a) 2   b) 0   c) 4   d) None of these

5. If $x^2+kx+14 = (x+2)(x+7)$ for all k, find the value of $2k+1$.

   a) 29   b) 28   c) 25   d) None of these

6. Which point lies on intersection of x-axis and y-axis?

   a) (0,2)   b) (3,0)   c) (0,0)   d) None of these

7. If $2a + 2b + 2c = 0$, then the value of $a^3 + b^3 + c^3+6abc$

   a) 9abc   b) $-3abc$ c) 3abc   d) None of these

8. Ordinate of a point is positive in

   a) I quadrant   b) I and II quadrants   c) II quadrant only   d) I and IV quadrants

9. The solution of equation $2x+2y-4=0$ is:

a) (0, 2) b) (2,0) c) Both a and b d) None of these

10. Find the value of k, if $x = -1$, $y = 2$ is a solution of the equation $2x + 3y = \sqrt{k}$.

a) 25 b) 6 c) 5 d) None of these

11. There are _____ number of Euclid's Postulates

a) 1 b) 2 c) 3 d) 5

12. If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 7 : 2, then the greater of the two angles is:

a) 80° b) 100° c) 140° d) None of these

13. If the supplement of an angle is 4 times of its compliment, find the angle.

a) 60° b) 72° c) 47° d) None of these

14. If $(x + 2)$ is a factor of $x^3 - 2ax^2 + 16$, then value of a is

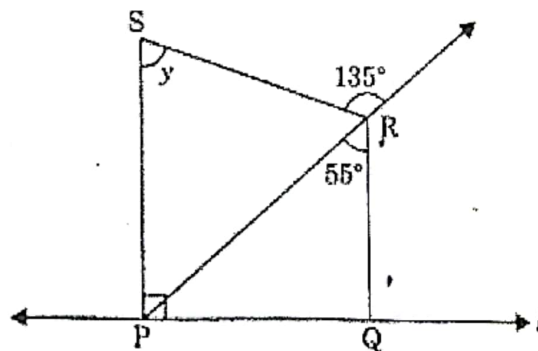a) 3 b) 1 c) 4 d) None of these

15. If $(2x+3, 5) = (9, y-1)$, then coordinates (x, y) are

a) (3,4) b) (4,6) c) (3,6) d) None of these

16. How many line/lines can pass through two points?

a) 1 b) 2 c) 3 d) None of these

17. In the figure, PS ⊥ L, RQ ⊥ L, the degree measure of ∠RPQ is.

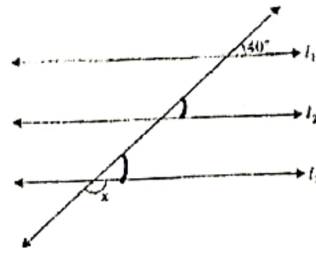

a) 35° b) 80° c) 55° d) None of these

18. Given lines $l_1 \parallel l_2$ and $l_2 \parallel l_3$ in figure. The value of x is

a) 40°

• b) 140°

c) 50°

d) 80°

Assertion—Reason Type Questions

Questions number 19 and 20 are Assertion and Reason based questions carrying 1 mark each. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R) . Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

19. Assertion(A): There are infinite number of lines which passes through (1,2).

Reason(R) : A linear equation in two variables has infinitely many solutions.

a) Both Assertion and reason are correct and reason is correct explanation for Assertion .

• b) Both Assertion and reason are correct but reason is not correct explanation for Assertion .

c) Assertion is correct but reason is false

d) Both Assertion and reason are false

20. Assertion(A) : If $\sqrt{2}=1.414, \sqrt{3}=1.732$, then $\sqrt{6}=\sqrt{2} \times \sqrt{3}$

Reason (R): Square root of a positive real number doesn't exist.

a) Both Assertion and reason are correct and reason is correct explanation for Assertion .

b) Both Assertion and reason are correct but reason is not correct explanation for Assertion .

c) Assertion is correct but reason is false

d) Both Assertion and reason are false

SECTION B

(2)

21. Factories: $2x^2 + y^2 + 8z^2 + 2\sqrt{2}xy - 4\sqrt{2}yz - 8xz$.

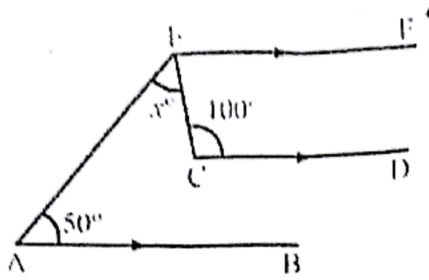(OR)   (2)

If $P(m) = m^3 + 3m^2 - 2m + 4$, then find the value of $P(1)+P(-1)- P(0)$

22. Find the value of k, if $x = 2$, $y = 1$ is a solution of the equation $2x + 3y+2= \sqrt{k}$ (2)

(2)

23. If $x=\dfrac{2}{(\sqrt{3}-1)}$,Find the value of $x^2+3x+6\sqrt{3}$

24. In the given figure, AB || CD, ∠ECD = 100°, ∠EAB = 50° and ∠AEC = x°. Find the value of x   (2)

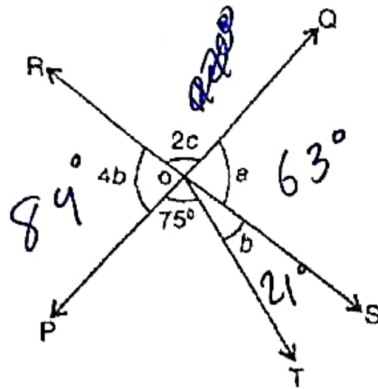25. If a point O lies between two points M and N such that MO = ON, then prove that MO = $\frac{1}{2}$MN. Explain by drawing the figure.   (2)

(OR)

Does Euclid's fifth postulate imply the existence of parallel lines? Explain.   (2)

SECTION C

26. In the given figure, two straight lines PQ and RS intersect each other at O. If ∠POT = 75°, find the values of a, b, c.   (3)

27. Write the linear equations 3x+2y=18 in the form of ax+by+c=0. write the value of a,b and c. Are (4,3) and (1,2) solutions of this equation.   (1+1+1)

28. If $5^{(-x^2-4x)} \times 3^{(-y^2-4y)} \times 2^z = 81000$, Find the value of x+y+z and $x^3+y^3+z^3$ (3)

(OR)

If a+b+c=36, Find the value of $(12-a)^3+(12-b)^3+(12-c)^3$ (3)

29. Answer the following questions   (2+1)

(I) If the coordinates of a point M are (−1,4), which can also be expressed as (1+s, t^2) and t > 0, then find the coordinates of P (2s, −3t) and Q (s, 1−t). Also find which quadrants these points lie in.

(II) In a Cartesian plane, what are the coordinates of a point P that is 4 units to the left of origin and 3 units below the origin?

30. Prove that if two lines intersect each other, then the vertically opposite angles are equal. (3)

(OR)

If a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel. (3)

31. Answer the following questions : (2+1)

(I). Show that 1.9999.................. is equal to 2.

(II).The number 0.318564318564318564.......... is a rational number or irrational number. Justify

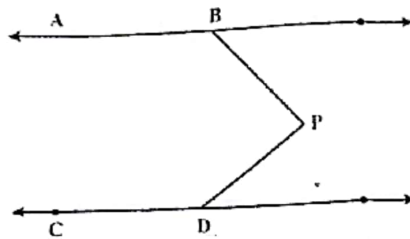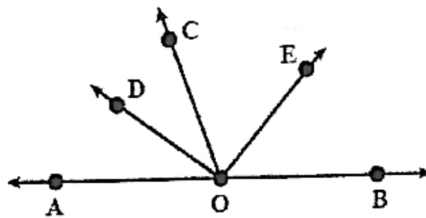## SECTION D

32. Answer the following questions: (2.5+2.5)

(I).In the given figure, AB ∥ CD and P is any point shown in the figure. Prove that:
$\angle ABP + \angle BPD + \angle CDP = 360°$

(II).In the figure, OD is the bisector of $\angle AOC$, OE is the bisector of $\angle BOC$ and OD ⊥ OE. Show that the points A, 0 and B are collinear.

33. Answer the following questions:

(i). Verify that: $x^3+y^3+z^3-3xyz = \frac{1}{2}(x+y+z)[(x-y)^2+(y-z)^2+(z-x)^2]$ (3)

(II) If a+b+c=12 and $a^2+b^2+c^2=90$. Find the value of $a^3+b^3+c^3-3abc$. (2)

(OR)

Answer the following questions:

(I).Factorise the given expression : $16a^3+ \frac{24a^2}{5}+\frac{12a}{25}+\frac{2}{125}$ (2.5)

(II).Factorise the given expression: $54p^3- 2- 250q^3 - 90pq$ (2.5)

34. If $P = (1 + \sqrt{7})$ and $x = (9 - 4\sqrt{5})$ then find the value of $x + \dfrac{1}{x} + \dfrac{(-6)}{P}$ (5)

(OR)

Determine rational numbers a and b if $\dfrac{(\sqrt{6}+\sqrt{3})}{(\sqrt{6}-\sqrt{3})} - \dfrac{(\sqrt{6}-\sqrt{3})}{(\sqrt{6}+\sqrt{3})} = (a + 4\sqrt{2}b)$. (5)

35. Write their coordinate and indicate the quadrant/quadrants in which they will lie, if. (5)

(i)   Square of ordinate is 9 and square root of abscissa is 3

(ii) The sum of abscissa and ordinate is 5 units and ordinate is 2 more than twice of abscissa.

(iii) The abscissa is – 6 and ordinate is 3

(iv) The ordinate is 4 and abscissa is square root of ordinate.

(v)   The ordinate is 1 and abscissa two more than half of ordinate .

SECTION E
(CASE STUDY BASED QUESTIONS ARE COMPULSORY)

36. Direction for Question:

In the given figure AB||CD and CD||EF. Also EA⊥AB. If ∠BEF=55°
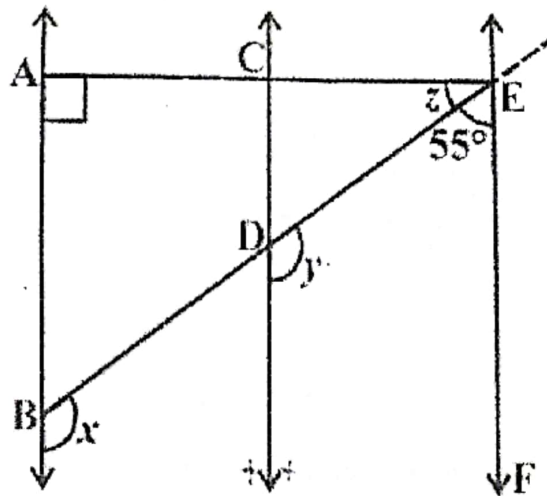
I.   Find the value (x+y): (x−z) (1)
II. What is the measures of ∠ACD. (1)
III. Find ∠CEF − ∠CDE (2)
        (OR)
     Find ∠CDE+∠ABE (2)

37. Direction for Question:

The taxi fare in a city is as follows: For the first kilometer, the fare is Rs.10 and for the subsequent distance it is Rs 5 per km. Taking the distance covered as x km and total fare as Rs y.

I.   Write the linear equation in two variables in the form of ax+by+c=0 and indicate the. value of a,b and c.   (1)

II. Find the total cost to be paid for the journey of 25 km ?   (1)

III. Find four solution for the formed linear equation.   (2)

(OR)

(6, 4a) is one of the solution of the above linear equation. Find the value of b
If 7a+2b=19   (2)

38. Direction for Question:

Two students in class of IX named Riya and Ravya were assigned one polynomial each by their Math teacher. The polynomial were as follows :

$p(x) = x^3 + 13x^2 + 32x + 20$

$q(y) = y^3 - 6y^2 + 11y - 6$.

They were asked to express given polynomial as product of factors. Both applied factorisation and got answer.

Riya's answer: $(x+1)(x+2)(x+10)$

Ravya's answer: $(y-1)(y-2)(y+3)$

I.   Write the degree of the given polynomials and coefficient of x^3 and y^2 in each case.   (1)

II. Find the value of P(−2) for the both the polynomial   (1)

III. Find out whose answer is correct and show factorisation.   (2)

(OR)

Write the sum of zeroes whose answer is correct and show factorisation.   (2)