MID-TERM EXAMINATION

Question Paper 2024-25

NCERT BASED SYLLABUS

FOR CBSE AND STATE BOARD
FOLLOWING NCERT

Mid Term Exam Question Paper 2024-25

Name : .....

Roll No. : .....

Date : 17.09.2024 | Time : 3 Hrs.

Class : X | M.M. : 80

MIDTERM EXAMINATION 2024

SUBJECT : MATHEMATICS (SET – A)

General Instructions :

- The question paper contains five sections A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.
- **Section A** has MCQs and 2 Assertion – Reason based questions of 1 mark each.
- **Section B** has 5 very short answer type questions of 2 marks each.
- **Section C** has 6 short answer type questions of 3 marks each.
- **Section D** has 4 long answer type questions of 5 marks each.
- **Section E** has 3 case based integrated units of assessment (4 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
- All questions are compulsory. However, an internal choice in 2 questions of 5 marks, 2 questions of 3 marks and 2 questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section – E.
- Draw neat figures wherever required. $Take = \frac{22}{7}$, whenever required if not stated.

Section – A

(This section comprises of Multiple Choice Questions (MCQS) of 1 mark each)

01. If p and q are two district prime numbers, then LCM (p,q) is (1)
(A)1 (B) p (C) q (D) pq

02. If LCM $(x, 18) = 36$ and HCF $(x, 18) = 2$ then x is (1)
(A) 2 (B) 3 (C) 4 (D) 5

03. $\sqrt{5} + \sqrt{3} + 2$ is (1)
(A) a natural number (B) an integer (C) a rational number (D) an irrational number

04. The decimal expansion of $17/8$ will terminate after how many places of decimals ?
(A) 1 (B) 2 (C) 3 (D) will not terminate

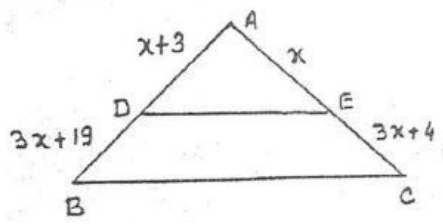
05. If the system of equations $2x + 3y = 5$, $4x + ky = 10$ has infinitely many solutions, then $k =$ (1)
(A) 1 (B) ½ (C) 3 (D) 6

06. If a pair of equations is consistent, then the lines representing them are (1)
(A) parallel (B) always coincident (C) intersecting or coincident (D) always intersecting

07. If the sum of ages of father and his son in years is 65 and twice the difference of their ages in years is 50, then the age of father is (1)
(A) 40 years (B) 45 years (C) 55 years (D) 65 years

08. If α, β are the zeros of the polynomial $f(x) = x^2 + x + 1$, then $1/\alpha + 1/\beta =$ (1)
(A) 1 (B) -1 (C) 0 (D) none of these

09. In figure the value of x for which $DE||BC$ is (1)



(A) 4 (B) 1 (C) 3 (D) 2

10. The distance of the point $p(2,3)$ from the $x - axis$ is (1)
(A) 2 (B) 3 (C) 1 (D) 5

11. If $x\ tan45°\ cos60° = sin60°\ cot60°$, then x is equal to (1)
(A) 1 (B) $\sqrt{3}$ (C) ½ (D) $\frac{1}{\sqrt{2}}$

12. $\frac{2\tan 30°}{1+tan^2 30°}$ is equal to (1)
(A) sin 60° (B) cos 60° (C) tan 60° (D) sin 30°

13. If $tanx = 3\cot x$ then = ? (1)
(A) 60° (B) 45° (C) 30° (D) 15°

Contd...2

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14. $\text{Sin } 2A = 2Sin\ A$ is true when $A =$
(A) 0° (B) 30° (C) 45° (D) 60° (1)

15. If the area of a sector of a circle is $\frac{7}{20}$ of the area of the circle, then the sector angle is equal to
(A) 110° (B) 130° (C) 100° (D) 126° (1)

16. A die is thrown once. The probability of getting an odd number is
(A) $\frac{2}{3}$ (B) $\frac{1}{3}$ (C) ½ (D) $\frac{1}{6}$ (1)

17. The probability of selecting a consonant from the letters of the word 'TRIANGLE' is
(A) $\frac{2}{7}$ (B) $\frac{3}{8}$ (C) $\frac{5}{8}$ (D) $\frac{1}{8}$ (1)

18. A number is selected from the numbers 1 to 20. The probability that it is prime is
(A) $\frac{2}{5}$ (B) $\frac{1}{6}$ (C) $\frac{9}{25}$ (D) $\frac{5}{6}$ (1)

In Assertion (A) – Reason (R) questions, you have to choose correct option amongst the following options
(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(C) Assertion (A) is true but Reason (R) is false.
(D) Assertion (A) is false but Reason (R) is true.

19. **Statement – 1 (Assertion) :** If the probability of occurrence of an even is 0.7, then the probability of its non-occurrence is 0.3.
Statement – 2 (Reason) : For any event A, P(A)+P(not A) = 1.

20. **Statement – 1 (Assertion) :** If $sin\ \theta + sin^2\theta = 1$ then $cos^2\theta + cos^4 = 1$.
Statement – 2 (Reason) : $1 - sin^2\theta = cos^2\theta$ (1)

Section – B

21. The HCF of two numbers is 18 and their product is 12960. Find their LCM. (2)

22. If -4 is a zero of the polynomial at $x^2 - x - (2k + 2)$ then find the value of k. (2)

OR

If the sum of the zeros of the quadratic polynomial $kx^2 - 3x + 5$ is 1, write the value of k.

23. Diagonals AC and BD of a trapezium ABCD with $AB \parallel DC$ intersect each other at the point O.
Show that $\frac{OA}{OC} = \frac{OB}{OD}$ (2)

24. In a right triangle ABC, right-angled at B, if $tanA = 1$ then verify that $2sinAcosA = 1$ (2)

OR

If $tanA = 1$ and $tanB = \sqrt{3}$, evaluate $cosAcosB - sinA\ sinB$.

25. Find the area of a sector of a circle with radius 6 cm, if the angle of sector is 60°. (2)

Section – C

26. Prove that $3 + 2\sqrt{5}$ is irrational. (3)

27. Find the zeros of the polynomial $6x^2 - 3 - 7x$ and verify the relationship between the zeros and the coefficients. (3)

28. The sum of the digits of a two-digit number is 9. Also, nine times this number is twice the number obtained by reversing the order of the digits. Find the number. (3)

29. Show that the points $(1,7), (4,2), (-1,-1)$ and $(-4,4)$ are the vertices of a square. (3)

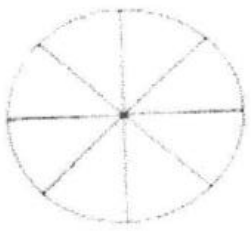
30. Find the coordinates of the points of trisection of the line segment joining the points $A(2,-2)$ and $B(-7,4)$. (3)

OR

Find the point on the $x - axis$ which is equidistant from $(2,-5)$ and $(-2,9)$.

31. A chord of a circle of radius 12 cm subtends an angle of 120° at the centre. Find the area of the corresponding segment of the circle. (Use $\pi = 3.14\ and\ \sqrt{3} = 1.73$) (3)

OR



A brooch is made with silver wire in the form of a circle with diameter 35 mm. The wire is also used in making 5 diameters which divide the circle into 10 equal sectors as shown in figure.
Find : (i) the total length of the silver wire required.
(ii) the area of each sector of the brooch.

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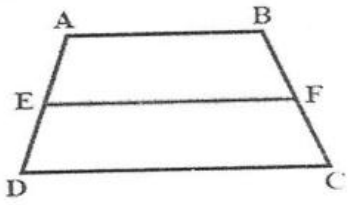
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Section – D

32. Six years hence a man's age will be three times the age of his son and three years ago he was nine times as old as his son. Find their present ages. (5)

OR

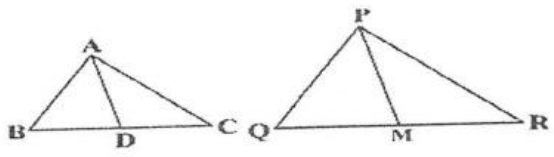
In a given fraction, if the numerator is multiplied by 2 and the denominator is reduced by 5, we get 6/5. But if the numerator of the given fraction is increased by 8 and the denominator is doubled we get 2/5. Find the fraction. (5)

33. 

In the given figure ABCD is a trapezium with $\| DC$. E and F are points on non-parallel sides AD and BC respectively, such that EF is parallel to AB. Show that $\frac{AE}{ED} = \frac{BF}{FC}$ (5)

OR

Sides AB and BC and median AD of a triangle ABC are respectively proportional to the sides PQ and QR and median PM of ΔPQR. Show that $\Delta ABC \sim \angle PQR$.

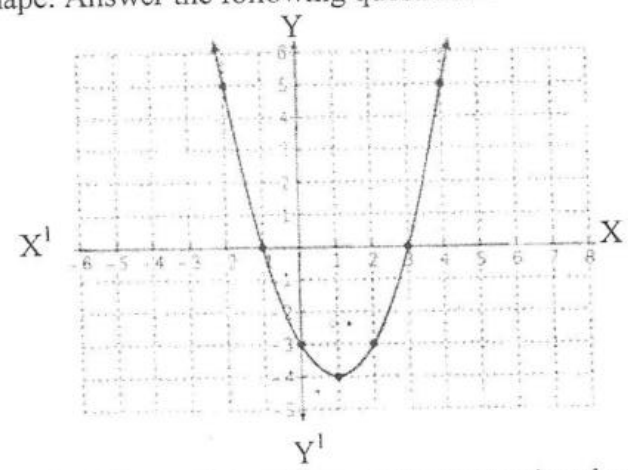


34. $\frac{\tan A}{(1-cotA)} + \frac{cotA}{(1-tanA)} = (1 + tanA + cotA)$ (5)

35. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting
(i) a king of red suit.
(ii) a queen of black suit.
(iii) a jack of hearts.
(iv) a red face card.
(v) an ace. (5)

Section – E

36. Due to heavy storm an electric wire got bent as shown in the following figure. It followed a mathematical shape. Answer the following questions :

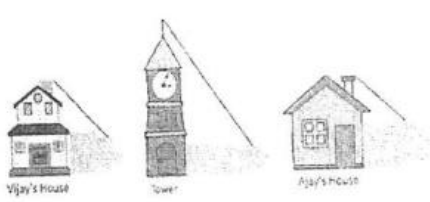


(i) Write the standard form of the polynomial representing the wire. (1)
(ii) What are the zeros for the polynomial representing the shape of the wire. (1)
(iii) What is the value of the polynomial at $x = -1$. (2)

OR

What is the expression of the polynomial representing the wire?

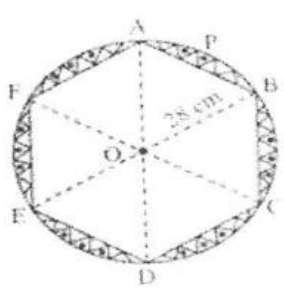
37. Vijay is trying to find the height of a tower near his house. The height of Vijay's house is 20 m when Vijay's house casts a shadow of 10 m long on the ground. At the same time, the tower casts a shadow 50 m long on the ground and the house of Ajay casts 20 m. shadow on the ground. On the basis of this information, answer the following questions :



(i) What is the height of the tower ? (1)
(ii) Using which concept of mathematics can the height of the tower be found ? (1)
(iii) What will be the length of the shadow of the tower when Vijay's house casts a shadow of 12 m ? (2)

OR

What is the height of Ajay's house ?

38. 

Aarushi's mother is making a table cover for a round table. Aarushi painted a design on it. It has six equal designs as shown in figure. The radius of the cover is 28 cm. Taking $\sqrt{3} = 1.73$. Answer the following :
(i) In figure what is the measure of $\angle AOB$? (1)
(ii) What is the area of ΔAOB ? (1)
(iii) What is the area of 1 design ? (2)

OR

What is the area of sector OAPB is ?

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