Std.: 10th ICSE Sub: Maths Date : 26/12/2022	Rathi's Aspire Academy Preparing You For Tomorrow **Pre-Board Test** **Set-1**	Marks : 80 Time : $2\frac{1}{2}$ Hr. Date : 26/12/2022

General Instructions:

(i) Answers to this paper must be written on the paper provided separately.

(ii) You will not be allowed to write during first 15 minutes. This time is to be spent in reading the question paper.

(iii) The time given at the head of this paper is the time allowed for writing the answers.

(iv) Attempt **all** questions from **Section A** and **any four** questions from **Section B**.

(v) All working, including rough work, must be clearly shown, and must be done on the same sheet as the rest of the answer.

(vi) Omission of essential working will result in loss of marks.

(vii) The intended marks for questions or parts of questions are given in brackets [ ]

(viii) Mathematical tables are provided.

SECTION - A

*(Attempt **all** questions from this Section.)*

1. Choose the correct answers to the questions from the given options: [15]

(i) Sale price of a chair is ₹ 4,000. G.S.T incharged at the rate of 18%. The price paid by customer is:

(a) 4.018 (b) 4,500

(c) 4,000 (d) 4,720

(ii) The value of k for the quadratic equation $x^2 - kx + 4 = 0$, to have real and equal roots.

(a) –4 (b) +-4

(c) 2 (d) –2

(iii) If $2x - 1$ is a factor of $4x^2 + 8x + k$, the value of k is:

(a) –5 (b) 4

(c) 2 (d) 3

(iv) $\begin{bmatrix}1 & 2\end{bmatrix} \times \begin{bmatrix}3\\4\end{bmatrix} = P$

The order of matrix P is

(a) 1 × 1 (b) 2 × 1

(c) 2 × 2 (d) 1 × 2

(v) 15, 13, 11, ... are in Arithmetic progression which term is the first negative term

(a) 7^{th} (b) 8^{th}

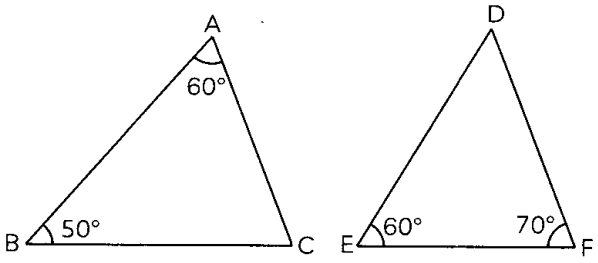
(c) 9^{th} (d) 10^{th}

(vi) The point $P(7, -6)$ is first reflected in x-axis to point Q and then Q is reflected in y-axis to point R. The coordinates of point R are:

(a) (7, 6) (b) (–7, 6)

(c) (–7, –6) (d) None of these

(vii) In $\triangle ABC$ is similar to $\triangle EDF$ by the axiom:



(a) SSS (b) SAS

(c) AAA (d) RHS

(viii) The volume and surface area of a sphere are numerically equal, the radius of sphere is:

(a) 3 units (b) 4 units

(c) 5 units (d) 1 unit

(ix) The solution for the given inequation is:

$4 \leq 2x - 2 < 10, x \in W$

(a) {3, 4} (b) {3, 4, 5}

(c) {2, 3, 4, 5} (d) None of these

(x) The probability of getting a prime number from a single throw of a die is:

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$

(c) $\frac{1}{4}$ (d) $\frac{1}{6}$

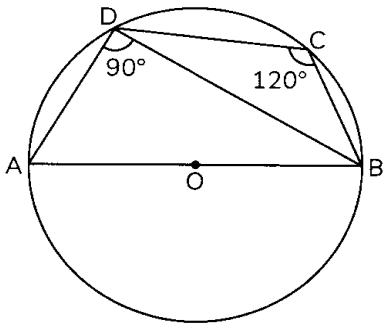
(xi) If $\begin{bmatrix} 3 & x \\ 4 & 1 \end{bmatrix} + 2\begin{bmatrix} 4 & 1 \\ 2 & -1 \end{bmatrix} = \begin{bmatrix} 11 & 7 \\ 8 & -1 \end{bmatrix}$

The value of x is :

(a) 5 (b) 4

(c) 3 (d) 2

(xii) In the given figure, O is the centre of circle. $\angle ABD$ is equal to:



(a) 60° (b) 30°

(c) 45° (d) 90°

(xiii) The equation of a line passing through (3, 4) and parallel to x-axis is:

(a) $x = 3$ (b) $y = 4$

(c) $3x + 4y = 0$ (d) None of these

(xiv) If the n^{th} term of an A.P is $3x - 2$. The common difference of the A.P is:

(a) 1 (b) 2

(c) 4 (d) 3

(xv) If the ratio of mode and median of a certain data is 6 : 5, then the ratio of its mean and median is:

(a) 10 : 9 (b) 9 : 10

(c) 10 : 7 (d) 7 : 10

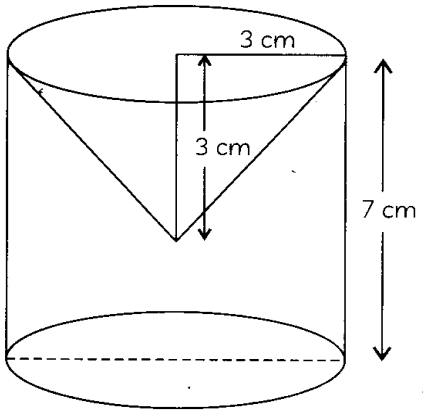
2. (i) Saanvi has a recurring deposit account and deposits ₹ 750 per month for two years. If she gets ₹ 19,125 at the time of maturity, find the rate of interest. [4]

(ii) If $\frac{7m+2n}{7m-2n} = \frac{5}{3}$, use properties of proportion to find $m : n$. [4]

(iii) Prove that: [4]

$(\text{cosec}\,\theta - \sin\theta)(\sec\theta - \cos\theta)(\tan\theta + \cot\theta) = 1$

3. (i) A hemispherical and a conical hole is scooped out of a solid wooden cylinder. Find the volume of the remaining solid. [4]



(ii) Find the equation of a line from a point where $3x + 4y = 12$ cuts x-axis and perpendicular to it. [4]

(iii) Use graph paper for this qusetion. Take 1 cm = 1 unit on both x and y-axis. [5]

(a) Plot the following points on your graph selects $A(-4, 0)$, $B(-3, 2)$, $C(0, 4)$, $D(4, 1)$ and $E(7, 3)$.

(b) Reflect the points B, C, D and E on the x-axis and name them B', C', D' and E' respectively.

(c) Join the points A, B, C, D, E, E', D', C' and A in order.

(d) Name the closed figure formed.

SECTION - B

*(Attempt **any four** questions from this Section.)*

4. (i) Find the total bill including GST of the following item: [3]

Article	Marked Price	Rate of GST
Chair	1,800	18%
Vineer	4,000	28%

(ii) Solve the following quadratic equation:[3]

$x^2 + 3x - 4 = 0$

Give your answer correct to two places of decimal.

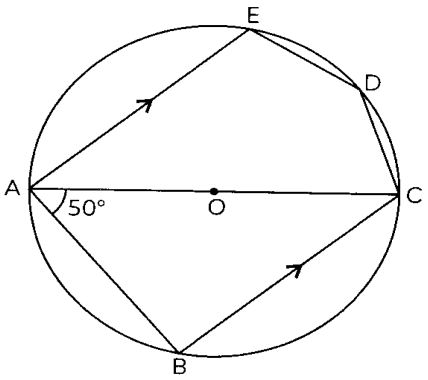
(iii) Draw a Histogram for the given data, using a graph paper. [4]

Weekly Wages (in ₹)	No. of People
3000-4000	4
4000-5000	9
5000-6000	18
6000-7000	6
7000-8000	7
8000-9000	2
9000-10000	4

Estimate the mode from the graph.

5. (i) Given $A = \begin{bmatrix} x & 3 \\ y & 3 \end{bmatrix}$, if $A^2 = 3I$, where I is the identity matrix of order 2, find x and y. [3]

(ii) In the given figure, $ABCDE$ is a pentagon inscribed in a circle such that AC is a diameter and side $BC \parallel AE$. If $\angle BAC = 50°$, find giving reasons. [3]



(a) $\angle ACB$

(b) $\angle EDC$

(c) $\angle BEC$

(iii) Factorise the given polynomial completely, using remainder theorem: [4]

$6x^3 + 17x^2 + 4x - 12$

6. (i) $A(-1, 3)$, $B(4, 2)$ and $C(3, -2)$ are the vertices of a triangle. [3]

(a) Find the coordinates of the centroid of the triangle.

(b) Find the equation of the line through G and parallel to BC.

(ii) Prove that: [3]

$\sqrt{\sec^2\theta + \text{cosec}^2\theta} = \tan\theta + \cot\theta$

(iii) If the 6^{th} term of an A.P is equal to four times its first term and the sum of first six terms is 75, find the first term and common difference. [4]

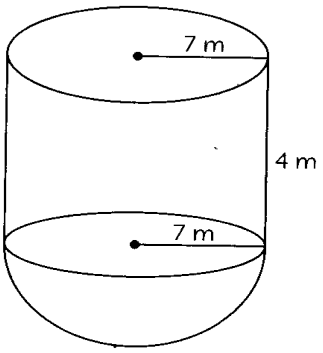
7. (i) There are 25 dises numbered 1 to 25. They are put in a closed box and shaken thoroughly. A disc is drawn at random from the box. Find the probability that the number on the disc is [3]

(a) an odd number

(b) divisible by 2 and 3 both

(c) a number less than 16.

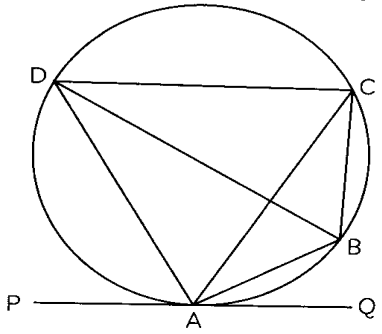
(ii) A container is in the shape of cylinder with radius 7m and hight 4 m with one hemispherical end as shown in the figure. Find the volume of the container. [3]



(iii) In the given figure, PQ is a tangent to the circle at A. AB and AD are bisectors of $\angle CAQ$ and $\angle PAC$. If $\angle BAQ = 30°$, prove that [4]

(a) BD is a diameter of the circle

(b) ABC is an isosceles triangle.

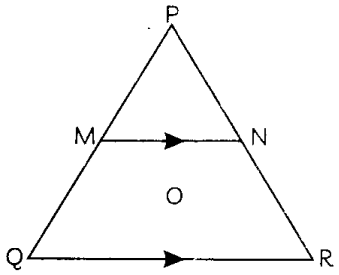


8. (i) Solve the following inequation, write down the solution set and represent on the real number line: [3]

$-2 + 10x \leq 13x + 10 < 24 + 10x, x \in Z$

(ii) In ΔPQR, MN is parallel to QR and [3]

$$\frac{PM}{MQ} = \frac{3}{5}$$



(a) Find $\frac{MN}{QR}$

(b) Prove that ΔPMN is similar to ΔPQR.

(iii) The mean of the following data is 16. Calculate the value of f. [4]

Marks	No. of students
5	3
10	7
15	f
20	9
25	6

9. (i) The difference of two natural numbers is 7 and their product is 450. Find the numbers. [4]

(ii) Use graph paper for this question.

The marks obtained by 120 students in an English test are given below: [6]

Marks	No. of students
0 - 10	5
10 - 20	9
20 - 30	16
30 - 40	22
40 - 50	26
50 - 60	18
60 - 70	11
70 - 80	6
80 - 90	4
90 - 10	3

Draw the ogive and hence, estimate

(a) the median marks

(b) the number of students who did not pass the test if the pass percentage was 50.

(c) the upper quartile marks.

10. (i) Using properties of proportion, solve for x, given

$$\frac{\sqrt{5x} + \sqrt{2x-6}}{\sqrt{5x} - \sqrt{2x-6}} = 4$$ [3]

(ii) Using ruler and compasses, construct a regular hexagon of side 3 cm. [3]

(iii) The angle of elevation from a point P of the top of a tower QR, 50 m high is 60° and that of the tower PT from a point Q is 30°. Find the height of the lower PT, correct to the nearest metre. [4]