CAREERS360

ICSE 10th

Mathematics

Specimen Question Paper 2023

ICSE 2023 EXAMINATION

SPECIMEN QUESTION PAPER

MATHEMATICS

Maximum Marks: 80

Time allowed: Two and half hours

Answers to this Paper must be written on the paper provided separately.

You will not be allowed to write during first 15 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allowed for writing the answers.

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

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

Omission of essential working will result in loss of marks.

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

Mathematical tables are provided.

SECTION A

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

Question 1

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

(i) The SGST paid by a customer to the shopkeeper for an article which is priced at ₹500 is ₹15. The rate of GST charged is:

(a) 1.5%

(b) 3%

(c) 5%

(d) 6%

(ii) When the roots of a quadratic equation are real and equal then the discriminant of the quadratic equation is:

(a) Infinite

(b) Positive

(c) Zero

(d) Negative

(iii) If $(x-1)$ *is* a factor of $2x^2 - ax - 1$, then the value of 'a' is :

(a) -1

(b) 1

(c) 3

(d) -3

(iv) Given $\begin{bmatrix} a & b \\ c & d \end{bmatrix} \times X = \begin{bmatrix} p \\ q \end{bmatrix}$. The order of matrix X is :

(a) 2×2

(b) 1×2

(c) 2×1

(d) 1×1

(v) 57, 54, 51, 48, ...are in Arithmetic Progression. The value of the 8^{th} term is:

(a) 36

(b) 78

(c) –36

(d) –78

(vi) *The point* $A\,(p,q)$ *is invariant about* $x = p$ *under reflection.*

The coordinates of it's image A' *is*:

(a) $A'\,(p,-q)$

(b) $A'\,(-p,\ q)$

(c) $A'(p,\ q)$

(d) $A'\,(-p,-q)$

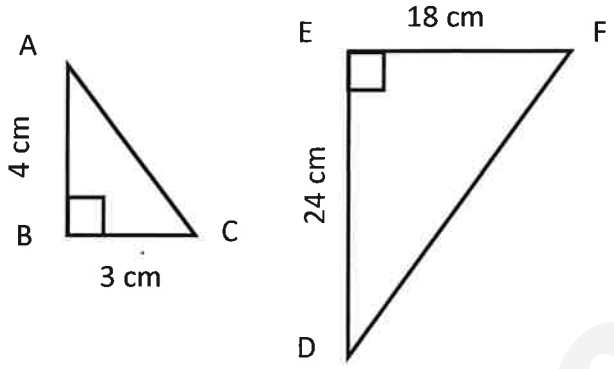
(vii) *In the given diagram the ΔABC is similar to ΔDEF by the axiom:*

(a) SSS

(b) SAS

(c) AAA

(d) RHS



(viii) The volume of a right circular cone with same base radius and height as that of a right circular cylinder, is 120 cm^3. The volume of the cylinder is:

(a) 240 cm^3

(b) 60 cm^3

(c) 360 cm^3

(d) 480 cm^3

(ix) The solution set for the given inequation is:

$-8 \leq 2x < 8, x \in W$

(a) {-4, -3, -2, -1, 0, 1,2, 3, 4}

(b) {-4, -3, -2, -1}

(c) {0, 1, 2, 3}

(d) {-8, -7, -6, -5, -4, -3, -2, -1, 0, 1,2, 3, 4, 5,6 7, 8}

(x) The probability of the Sun rising from the east is P(S). The value of P(S) *is*:

(a) $P(S) = 0$

(b) $P(S) < 0$

(c) $P(S) = 1$

(d) $P(S) > 1$

(xi) $If \begin{bmatrix} 2 & x \\ 0 & 1 \end{bmatrix} + 3\begin{bmatrix} 2 & 1 \\ 4 & 0 \end{bmatrix} = \begin{bmatrix} 8 & 8 \\ 12 & 1 \end{bmatrix}$

The value of x is:

(a) 2

(b) 3

(c) 4

(d) 5

(xii) The centroid of a ΔABC is G (6, 7). If the coordinates of the vertices A, B and C are (a, 5), (7, 9) and (5, 7) respectively.

The value of a is:

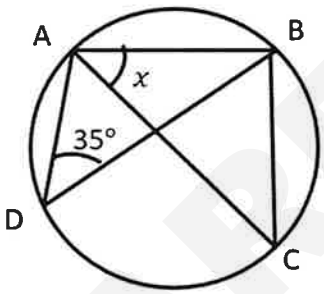
(a) 9

(b) 6

(c) 3

(d) 7

(xiii) In the given diagram AC is a diameter of the circle and ∠ADB=35°



The degree measure of x is:

(a) 55°

(b) 35°

(c) 45°

(d) 70°

(xiv) If the nth term of an Arithmetic Progression (A.P.) is (n + 3), then the first three terms of the A.P. are:

(a) 1,2,3

(b) 2,4,6

(c) 4,5,6

(d) 7,8,9

(xv) The median of a grouped frequency distribution is found graphically by drawing:

(a) a linear graph

(b) a histogram

(c) a frequency polygon

(d) a cumulative frequency curve

Question: 2

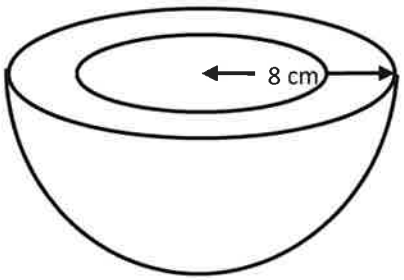
(i) Salman deposits ₹1200 every month in a recurring deposit account for 2 ½ years. If the rate of interest is 6% per annum, find the amount he will receive on maturity. [4]

(ii) 3, 9, m, 81 and n are in continued proportion. Find the values of m and n. [4]

(iii) $Prove\ that: \frac{\cos A}{1+\sin A} + \frac{1+\sin A}{\cos A} = 2\ secA$ [4]

Question 3

(i) The inner circumference of the rim of a circular metal tub is 44 cm. [4]



Find:

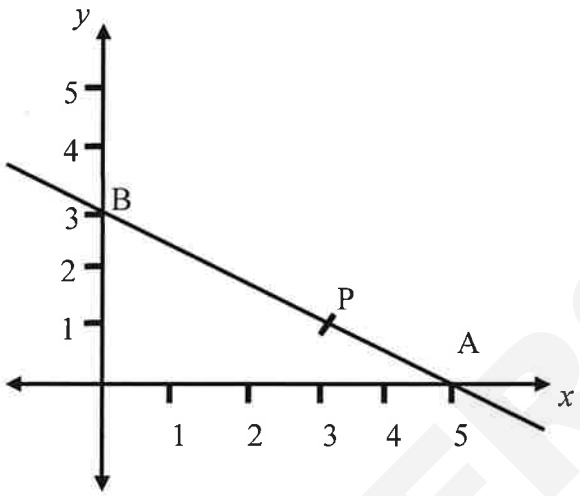
(a) The inner radius of the tub

(b) The volume of the material of the tub if it's outer radius is 8 cm.

Use $\pi = \frac{22}{7}$

Give your answer correct to three significant figures.

(ii) From the given figure: [4]



(a) Write down the coordinates of A and B.

(b) If P divides AB in the ratio 2:3, find the coordinates of point P

(c) Find the equation of a line parallel to line AB and passing through origin.

(iii) Use graph sheet for this question. Take 2 cm = 1 unit along the axes. [5]

Plot the $\Delta OAB, where\ O\ (0\ ,0), A\ (3,-2), B\ (2,-3)$.

(a) Reflect the ΔOAB through the origin and name it as $\Delta OA'B'$.

(b) Reflect the $\Delta OA'B'$ on the $y - axis$ and name it as $\Delta OA''B''$.

(c) Reflect the $\Delta OA'B'$ on the $x - axis$ and name it as $\Delta OA'''B'''$.

(d) Join the points $AA''B''B'A'A'''B'''B$ and give the geometrical name of the closed figure so formed.

SECTION B

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

Question 4

(i) The following bill shows the GST rates and the marked price of articles: [3]

BILL: COMPUTERS		
Articles	**Marked price**	**Rate of GST**
Graphic Card	Rs 15500.00	18%
Laptop adapter	Rs 1900.00	28%

Find the total amount to be paid for the above bill.

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

$$7x^2 + 2x - 2 = 0$$

Give your answer correct to two places of decimal

(iii) Use graph sheet for this question. Draw a histogram for the daily earnings of 54 medical stores in the following table and hence estimate the mode for the following distribution. Take 2 cm = ₹500 units along the x–axis and 2 cm = 5 stores along the y–axis. [4]

Daily earnings (₹)	4500 – 5000	5000 – 5500	5500 – 6000	6000 – 6500	6500 – 7000
No. of medical stores	20	14	12	5	3

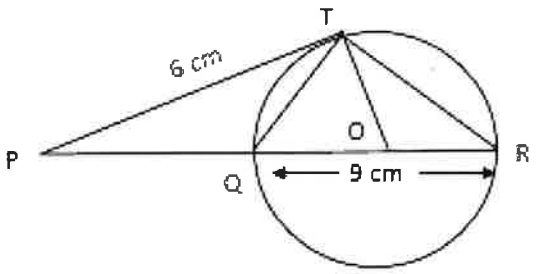
Question 5

(i) $A = \begin{bmatrix} 3 & -2 \\ -1 & 4 \end{bmatrix}, B = \begin{bmatrix} 6 \\ 1 \end{bmatrix}$ *and* $C = \begin{bmatrix} -4 \\ 5 \end{bmatrix}$, Evaluate AB – 5C [3]

(ii) In the given figure, O is the centre of circle. The tangent PT meets the diameter RQ produced at P. [3]

(a) $Prove\ \Delta PQT \sim \Delta PTR$

(b) $If\ PT = 6\ cm, QR = 9\ cm. Find\ the\ length\ of\ PQ$



(iii) Factorise the given polynomial completely, using Remainder Theorem: [4]

$6x^3 + 25x^2 + 31x + 10$

Question 6

(i) ABCD is a square where B (1, 3), D (3, 2) are the end points of the diagonal BD. Find: [3]

(a) the coordinates of point of intersection of the diagonals AC and BD

(b) the equation of the diagonal AC

(ii) $Prove\ that: \sqrt{sec^2\theta + cosec^2\theta} = sec\theta . cosec\theta$ [3]

(iii) The first, the last term and the common difference of an Arithmetic Progression are 98, 1001 and 7 respectively. Find the following for the given Arithmetic Progression: [4]

(a) number of terms *'n'*.

(b) Sum of the *'n'* terms.

Question 7

(i) A box contains some green, yellow and white tennis balls. The probability of selecting a green ball is $\frac{1}{4}$ and yellow ball is $\frac{1}{3}$. If the box contains 10 white balls, then find: [3]

(a) total number of balls in the box.

(b) probability of selecting a white ball.

(ii) A cone and a sphere having the same radius are melted and recast into a cylinder. The radius and height of the cone are 3 cm and 12 cm respectively. If the radius of the cylinder so formed is 2 cm, find the height of the cylinder. [3]

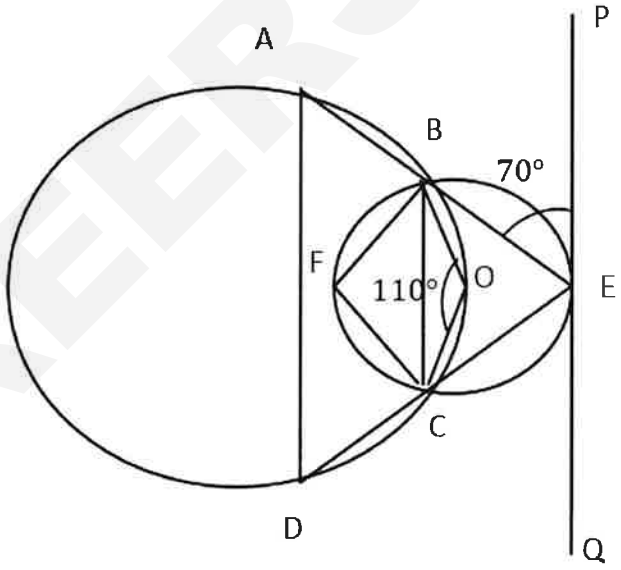
(iii) In the given diagram, ABCD is a cyclic quadrilateral and PQ is a tangent to the smaller circle at E. $Given \angle AEP = 70°, \angle BOC = 110°. Find$: [4]

(a) $\angle ECB,$

(b) $\angle BEC,$

(c) $\angle BFC,$

(d) $\angle DAB,$



Question 8

(i) Solve the following inequation: [3]

$$-\frac{x}{3} - 4 \leq \frac{x}{2} - \frac{7}{3} < -\frac{7}{6}, x \in R$$

Represent the solution set on a number line.

(ii) The following table gives the petrol prices per litre for a period of 50 days. [3]

Price (₹)	85 – 90	90 – 95	95 – 100	100 - 105	105 - 110
No. of days	12	10	8	15	5

Find the mean price of petrol per litre to the nearest rupee using step – deviation method.

(iii) In the given diagram, ABC is a triangle and BCFD is a parallelogram. [4]

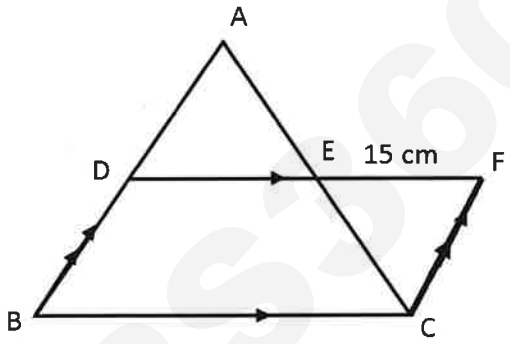
AD: DB = 4: 5 and EF = 15 cm.

Find:

(a) $AE : EC$

(b) DE

(c) BC



Question 9

(i) Amit takes 12 days less than the days taken by Bijoy to complete a certain work. If both, working together, takes 8 days to complete the work, find the number of days taken by Bijoy to complete the work, working alone. [4]

(ii) Use a graph sheet for this question. The daily wages of 120 workers working at a site are given below: [6]

Wages (₹)	250 – 300	300 – 350	350 – 400	400 - 450	450 – 500	500 – 550	550 - 600
No. of workers	8	15	20	30	25	15	7

Use 2cm = ₹ 50 and 2 cm = 20 workers along x – axis and y – axis respectively to draw an ogive and hence estimate:

(a) the median wages

(b) the inter – quartile range of wages

(c) percentage of workers whose daily wage is above ₹ 475.

Question 10

(i) Solve for x, using the properties of proportion. [3]

$$\frac{\sqrt{2+x}+\sqrt{3-x}}{\sqrt{2+x}-\sqrt{3-x}}=3$$

(ii) Using ruler and compasses, construct a regular hexagon of side 4.5 cm. Hence construct a circle circumscribing the hexagon. Measure and write down the length of the circum-radius. [3]

(iii) An observer standing on the top of a lighthouse 150 m above the sea level watches a ship sailing away. As he observes, the angle of depression of the ship changes from 50° to 30°. Determine the distance travelled by the ship during the period of observation. Give your answer correct to the nearest meter. (Use Mathematical Table for this question.) [4]