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/ Test Paper: [/mathematics_1998.html](https://www.sylvum.com/cgi/online/serve.cgi/exam/icse/mathematics_1998.html)

MATHEMATICS - 1998

(Two hours and a half)

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SECTION - A (52 Marks)

Answer **all** questions from this Section.

Question 1

A man invests Rs. 46,875 at 4% per annum compound interest for 3 years, Calculate: [2]

(i) The interest for the 1st year.

(ii) The amount standing to his credit at the end of the second year. [2]

(iii) The interest for the 3rd year. [2]

Question 2

A shopkeeper allowed a discount of 20% on the marked price of an article, and sold it for Rs. 896. Calculate: [2]

(i) His marked price;

(ii) By selling the article at the discounted price, if he still gains 12% on his cost price, what was the cost price? [2]

(iii) What would have been his profit %, if he had sold the article at the marked price? [2]

Question 3

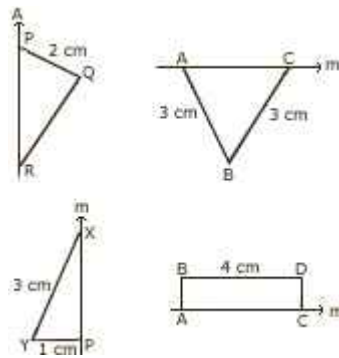
On a map drawn to a scale of 1 : 25000, a rectangular plot of land, ABCD, has the following measurements, AB = 12 cm and BC = 16 cm. Angles A, B, C and D are all 90° each. Calculate: [3]

(i) The diagonal distance of the plot in km,

(ii) The area of the plot in sq. km. [3]

Question 4

Part of a Geometrical figure is given in each of the diagrams below. [8]
Complete the figures so that the line 'm', in each case, is the line of symmetry of the completed figure. Recognizable free hand sketches will be awarded full marks.



Question 5

The wheel of a cart is making 5 revolutions per second. If the diameter of the wheel is 84 cm, find its speed in km/hr, Give your answer correct to the nearest km. [6]

Question 6

[6]

Ruler and compass only may be used in this question. All construction lines and arc must be clearly shown, and be of sufficient length and clarity to permit assessment.

◀ Construct a triangle ABC, in which $BC = 6$ cm, $AB = 9$ cm and angle ABC 60° ▶

(ii) Construct the locus of all points inside triangle ABC, which are equidistant from B and C.

(iii) Construct the locus of the vertices of the triangles with BC as base, which are equal in area to triangle ABC.

(iv) Mark the point Q in your construction, which would make ΔQBC equal in area to ΔABC , and isosceles.

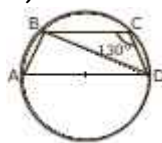
(v) Measure and record the length of CQ.

Question 7

A point P (a, b) is reflected in the X - axis to P' (2, -3). Write down the values of a and b. P'' is the image of P, when reflected in the Y- axis. Write down the co-ordinates of P''. Find the co-ordinates of P''', when P is reflected in the line, parallel to the Y- axis, such that $X = 4$. [7]

Question 8

- (a) In the figure given alongside, AD is the diameter of the circle. If $\angle BCD = 130^\circ$, calculate: (i) $\angle DAB$, [2]



- (ii) $\angle ADB$ [2]
 (b) State the locus of a point in a rhombus ABCD, which is equidistant [2]
 (i) From AB and AD
 (ii) From the vertices A and C. [2]

SECTION - B (48 Marks)

Answer any **four** questions from this Section.

Question 9

- (a) Evaluate the following using tables: [4]

$$\frac{0.284 \times \sqrt{136.78}}{(4.2)^2}$$

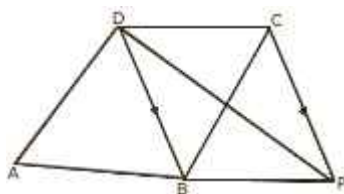
- (b) Find the value of x and y , if [4]

$$\begin{bmatrix} 1 & 2 \\ 3 & 3 \end{bmatrix} \begin{bmatrix} x & 0 \\ 0 & y \end{bmatrix} = \begin{bmatrix} x & 0 \\ 9 & 0 \end{bmatrix}$$

- (c) Solve the following inequation, and graph the solution set on the [4]
 number line:
 $2x - 3 < x + 2 \leq 3x + 5, x \in \mathbb{R}$

Question 10

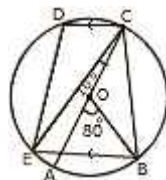
- (a) If a function in x is defined by $f(x) = x/x^2 + 1$ and $x \in \mathbb{R}$ find: [2]
 (i) $f(1/x)$, $x \neq 0$;
 (ii) $f(x - 1)$ [2]
 (b) The centre O, of a circle has the co-ordinates (4, 5) and one point on the circumference is (8, 10), Find the co-ordinates of the other end of the diameter of the circle through this point. [4]
 (c) In the figure given alongside APB is a straight line. BD is parallel to PC. Prove that the quadrilateral ABCD is equal in area to triangle APD. [4]



Question 11

(a) Use a graph paper for the question. Draw the graph of $2x - y - 1 = 0$, and $2x + y = 9$, on the same axes. Use 2 cm = 1 unit on both axes and plot only 3 points per line. Write down the co-ordinates of the point of intersection of the two lines. [6]

(b) In the diagram given alongside, AC is the diameter of the circle, with centre O. CD and BE are parallel. Angle AOB = 80° and angle ACE = 10° . Calculate: [2]



(i) Angle BEC

(ii) Angle BCD,

(iii) Angle CED.



[2]

Question 12

[12]

(a) A company with 10,000 shares of Rs. 100/- each declares an annual dividend of 5 %.

(i) What is the total amount of dividend paid by the company?

(ii) What would be the annual income of a man, who has 72 shares. In the company.

(iii) If he receives only 4% on his investment, find the price he paid for each share.

(b) (i) Find the equation of a line, which has y intercept. 4, and is parallel to the line $2x - 3y = 7$.

(ii) Find the co-ordinates of the point, where it cuts the x - axis.

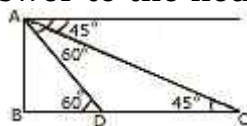
(c) Given below are the weekly wages of 200 workers in a small factory.

| | |
|-----------|----|
| 80 - 100 | 20 |
| 100 - 120 | 30 |
| 120 - 140 | 20 |
| 140 - 160 | 40 |
| 160 - 180 | 90 |

Question 13

(a) The figure drawn alongside is not to the scale. AB is a tower, and two [6]

objects C and D are located on the ground, on the same side of AB. When observed from the top A of the tower, their angles of depression are 45° and 60° . Find the distance between the two objects, if the height of the tower is 300 m, Give your answer to the nearest metre.



(b) The daily profits in Rupees of 100 shops in a department store are distributed as follows: [6]

| Profit per shop(in Rs.) | No. of shops |
|-------------------------|--------------|
| 0 - 100 | 12 |
| 100 - 200 | 18 |
| 200 - 300 | 27 |
| 300 - 400 | 20 |
| 400 - 500 | 17 |
| 500 - 600 | 6 |

Draw a histogram of the data given above, on graph paper, and estimate the mode.

Question 14

[1]

(a) Only ruler and compass may be used in this question. All construction lines and arcs must be clearly shown and be of sufficient length and clarity to permit assessment.

- Construct a ΔABC , such that $AB = AC = 7$ cm and $BC = 5$ cm.
- Construct AD , the perpendicular bisector of BC .
- Draw a circle with centre A and radius 3 cm. Let this circle cut AD at P .
- Construct another circle, to touch the circle with centre A , externally at P , and pass through B and C .

(b) The distance travel by car between two towns, A and B , is 216 km, and by rail it is 208 km. A car travels at a speed of x km/hr, and the train travels at a speed which is 16 km/hr faster than the car. Calculate:

- The time taken by the car to reach town B from A , in terms of x ;
- The time taken by the train to reach town B from A , in terms of x ;
- If the train takes 2 hours less than the car to reach town B , obtain the equation in x and solve it.
- Hence find the speed of the train.

Question 15

(a) A solid consisting of a right circular, standing on a hemisphere is placed upright in a right circular cylinder, full of water, and touches the bottom. Find the volume of water left in the cylinder, given that the radius is 3 cm and its height is 6 cm; the radius of the hemisphere is 2 cm and height of the cone is 4 cm. Give your answer to the nearest cubic centimeter. [6]

(Take $\pi = 22/7$)

(b) Attempt this question on a graph paper. The table shows the distribution of the daily wages, earned by 160 workers in a building site.

[3]

| Wages in Rs. per day | No. of Workers |
|----------------------|----------------|
| 0 - 10 | 12 |
| 10 - 20 | 20 |
| 20 - 30 | 30 |
| 30 - 40 | 38 |
| 40 - 50 | 24 |
| 50 - 60 | 16 |
| 60 - 70 | 12 |
| 70 - 80 | 8 |

Using a scale of 2 cm to represent Rs. 10 and 2 cm to represent 20 workers, plot these values, and draw a smooth ogive, through the points. Estimate from the graph.

(i) The Median wage;

(ii) The upper and lower quartile wage earned by the workers.

[3]