Estd. 1861

BOYS' HIGH SCHOOL AND COLLEGE
SECOND TERM EXAMINATION (2024-25)
CLASS – IX
MATHEMATICS

Time: 3hours **M.M: 80**

SECTION – A
(Attempt all questions from this section)

Q1. Choose the correct answers to the questions from the given options: **[15]**

(i) Which of the following is not true for a parallelogram?
(a) Opposite sides are equal
(b) Opposite angles are equal.
(c) Opposite angles are bisected by diagonals
(d) Diagonals bisect each other

(ii) If a triangle and a parallelogram are on the same base and between the same parallels, the ratio of the areas of the triangle and parallelogram is:
(a) 1:1
(b) 2:1
(c) 1:2
(d) 1:3

(iii) A frequency polygon is constructed by plotting, frequency of the class interval and the:
(a) upper limit of the class
(b) lower limit of the class
(c) any value of the class
(d) mid value of the class

(iv) A square and a rectangle have equal areas. If one side of the rectangle is of length numerically equal to the square of the length of the side of the square, then the other side of the rectangle is
(a) square root of the side of the square
(b) half the side of the square
(c) of unit length
(d) double the side of the square

(v)The length of the longest rod that can be fitted in a cubical vessel of edge 10cm long, is
(a) 10 cm
(b) $10\sqrt{2}$ cm
(c) $10\sqrt{3}$ cm
(d) 20cm

(vi) If the arcs AXB and CYD of a circle are congruent, then find the ratio AB: CD
(a) 1:2
(b) 2:1
(c) 1:1
(d) none of these

(vii)The range of 10 observations is 15 and the highest score is 28, then the least score of the data is
(a) 3
(b)13
(c) 14
(d) 5

(viii) Which of the following is an irrational number?
(a) $\sqrt{9}$
(b) $\sqrt[3]{13}$
(c) $\sqrt[4]{256}$
(d) $\sqrt[3]{8}$

(ix) If P is ₹1,000, R is 10% p.a. and the interest is being compounded annually then what is the principal for the second year?
(a) ₹1,100
(b) ₹1,000
(c) ₹1,010
(d) ₹1,100

(x) Two triangles are congruent if
(a) two angles of one are equal to two angles of the other.
(b) both are right-angled
(c) three angles of one are equal to three angles of the other
(d) three sides of one are equal to three sides of the other

(xi) Assertion (A): Mean and median of data 10,11,12,15,16 is same.
Reason (R): Mean and median of a given set of data may or may not be the same
(a) A is true, R is false
(b) A is false, R is true
(c) Both A and R are true, and R is the correct reason for A
(d) Both A and R are true, and R is the incorrect reason for A

(xii) One of the factors of $(x-1) - (x^2 - 1)$ is
(a) $x^2 - 1$
(b) x+1
(c) x-1
(d) x+4

(xiii) Which of the following is undefined?

(a) $-16^{\frac{1}{4}}$

(b) $16^{\frac{1}{4}}$

(c) $(-16)^{\frac{1}{4}}$

(d) $-16^{-\frac{1}{4}}$

(xiv) The number of circles that can be drawn through three non collinear points is

(a) 1

(b) 3

(c) 0

(d) 2

(xv) Which of the following quadrilateral is not a rhombus ?

(a) all four sides are equal

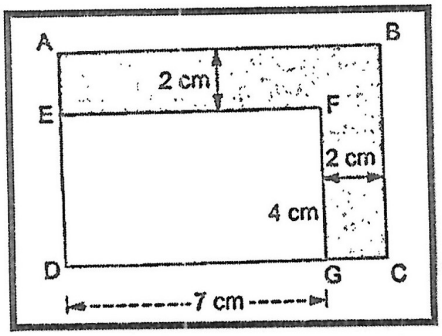
(b) diagonals bisect each other

(c) diagonals bisect opposite angles

(d) one angle between the diagonals is 60°.

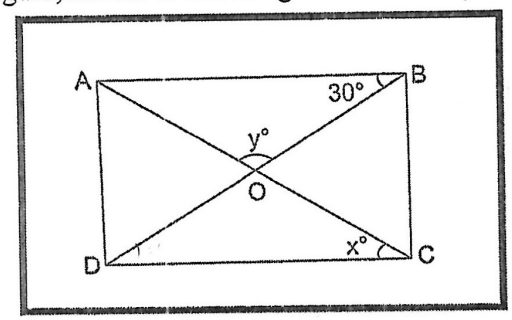
Question 2:

(i) Find the area of the shaded region. In the figure, ABCD is a ~~square.~~ rectangle [4]



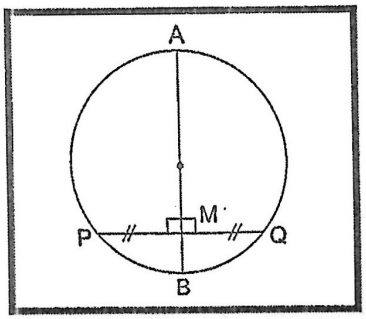
(ii) Two cubes are joined end to end to form a cuboid. Find the volume and the total surface area of the cuboid. [4]

(iii) In the adjoining figure, ABCD is a rectangle. Find x and y. [4]



Question 3:

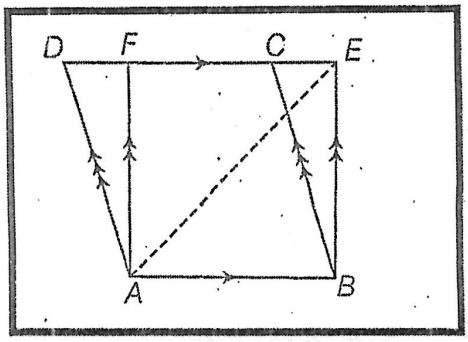
(i) In the given circle, the chord PQ is 18cm in length. AB, the perpendicular bisector of PQ, intersects at M. If MB = 3cm, find AB. [4]



(ii) In the given figure the area of parallelogram ABCD is 140cm². Find [4]

(a) ar(parallelogram ABEF)

(b) ar (ΔAEF)



(iii) The ages of 300 students of a school are collected and tabulated as below

Ages in years	below 10	below 12	below 14	below 16	below 18
Number of students	45	116	210	275	300

Construct a frequency table of the data. [5]

SECTION-B

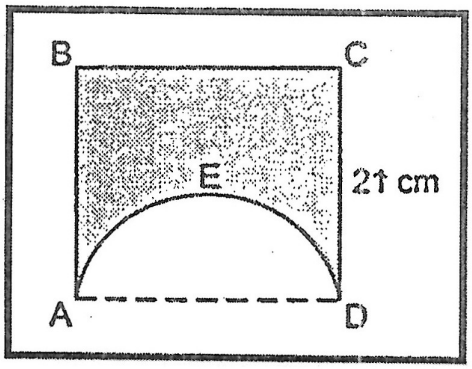
(Attempt any four questions from this section)

Question 4

(i) How many bricks, each 25 cm by 15 cm by 8 cm are required for a wall 32 m long, 3 m high,40 cm thick? [3]

(ii) Factorise: $6y^2-17y+12$ [3]

(iii) Find the area and perimeter of the shaded region. Here, ABCD is a square of side 21 cm and AED is a semicircle. [4]



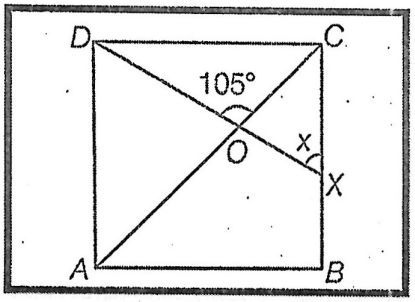
Question 5:

(i) Find the value of k in the following:

$$(\sqrt{9})^{-7} \times (\sqrt{3})^{-5} = 3^k$$ [3]

(ii) The mean daily wage earned by four labourers is ₹180. If another labourer Hari is included in the group, the mean daily wage goes up to ₹185. Find the daily wage of Hari. [3]

(iii) In the following figure, ABCD is a square. A line segment DX cuts the side BC at X and the diagonal AC at O, such that $\angle COD = 105°$. Find the value of x. [4]



Question 6:

(i)Find x if 4,5, 7, x+6, 11, 12, 15 are in order and their median is 10. [3]

(ii) The radius of a circle is 10cm. Find the length of the chord which is at a distance of 6cm from the centre of the circle. [3]

(iii) The external dimensions of a closed wooden box are 25cm, 23cm and 18cm. If the thickness of the wood is 2 cm, find

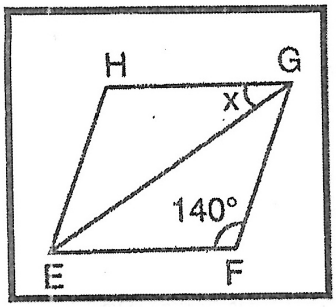
(i) the total inner surface area of the box;

(ii) the total cost of the wood required to make the box if the wood costs ₹ 1 per cm^3. [4]

Question 7:

(i) The area of a trapezium is $240cm^2$ and its parallel sides are in the ratio is 2:1. If the distance between the parallel sides is 10cm, then find the longer of the parallel sides. [3]

(ii) In the rhombus EFGH, find the angle marked with letter x. [3]

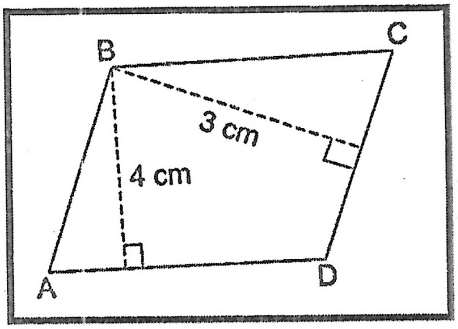


(iii) If the class intervals of the frequency distribution be 16-25, 26-35, 36-45, 46-55 then determine [4]

(a) the class limits and the class boundaries of the class 36-45
(b) the class size and the class mark of the class interval 46-55

Question 8:

(i) In the figure, ABCD is a parallelogram whose perimeter is 21cm. Find the area of the parallelogram. [3]



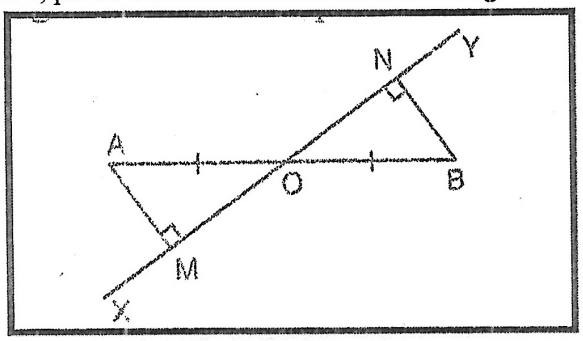
(ii) The base of an empty tank is a square of side 5m. Another tank whose dimensions are 2.5m × 4m × 2.5m is filled with water. The water of the second tank is transferred to the first tank. Find the height of the water level in the first tank. [3]

(iii) Find the mean of the given data: [4]

Weight (kg)	30	31	32	33	34
Number of students	8	10	15	18	9

Question 9:

(i) In the figure given below, prove that Δs OAM and OBN are congruent and hence prove that AM = BN [5]



(ii) Solve the following equations simultaneously:

$$\frac{7}{x}+\frac{8}{y}=2$$
$$\frac{2}{x}+\frac{12}{y}=20$$

[5]

Question 10:

(i)Draw a histogram and a frequency polygon in the same figure for the following distribution

Class Interval	0-30	30-60	60-90	90-120	120-150
Frequency	7	4	5	10	6

[5]

(ii) Construct a square ABCD whose diagonal AC = 5cm. [5]

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