

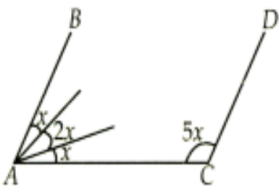
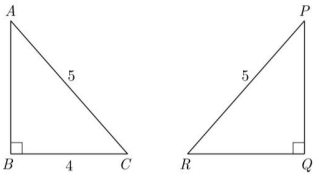
SAMPLE PAPER-2
FINAL EXAMINATION-2024
MATHEMATICS

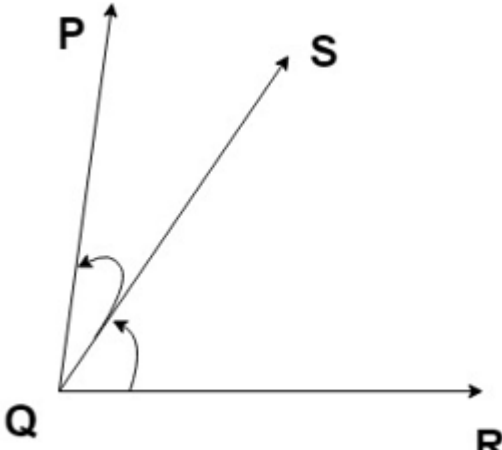
Time Allowed: 3 Hrs.

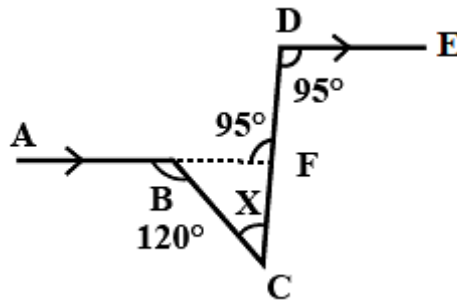
Maximum Marks : 80 General

Instructions:

1. This Question Paper has 5 Sections A-E.
2. Section **A** has 20 MCQs carrying 01 mark each
3. Section **B** has 5 questions carrying 02 marks each.
4. Section **C** has 6 questions carrying 03 marks each.
5. Section **D** has 4 questions carrying 05 marks each.
6. Section **E** has 3 case based integrated units of assessment (04 marks each) with sub parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs 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
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

S.NO	SECTION A Section A consists of 20 questions of 1 mark each.
1	Class mark of class interval 6.5 - 9.5 is a) 8.5 b) 8 c) 7 d) 7.5
2	$\sqrt{2}$ is a polynomial of degree a) 0 b) 1 c) $\frac{1}{2}$ d) 2
3	If $(16)^{2x+3} = (64)^{x+3}$, What is the value of x is a) 1 b) 3 c) 9 d) 27
4	Degree of the zero polynomial is a) 0 b) 1 c) any natural number d) not defined
5	If $AB \parallel CD$, what is the value of x? a) 30° b) 20° c) 40° d) 15°
	
6	If $\triangle ABC$ is congruent to $\triangle PQR$ then what is the length of QR? a) 4cm b) 8cm c) 9cm d) 6cm
	
7	Two adjacent angles of a rhombus are $(3x - 40^\circ)$ and $(2x + 20^\circ)$. The measurement of the smaller angle is a) 160° b) 80° c) 100° d) 120°
8	The quadrilateral formed by joining the mid-points of the sides of a quadrilateral FAST, taken in order, is a rectangle, if a) FAST is a rhombus b) FAST is a parallelogram c) diagonals of FAST are perpendicular d) diagonals of FAST are equal.

9	A chord is at a distance of 8 cm from the center of a circle of radius 17 cm. The length of the chord is a) 25 cm b) 12.5 cm c) 30 cm d) 9 cm
10	Axioms are assumed (a) universal truths in all branches of mathematics (b) universal truths specific to geometry (c) theorems (d) definitions
11	In a frequency distribution, the mid value of a class is 10 and the width of the class is 6. The lower limit of the class is : a) 6 b) 7 c) 8 d) 12
12	The area of an equilateral triangle is $16\sqrt{3} m^2$. Its perimeter is a) 24m b) 12m c) 306m d) 48m
13	Which of the following rational numbers is equivalent to a decimal that terminates? a) $\frac{1}{3}$ b) $\frac{2}{3}$ c) $\frac{3}{8}$ d) $\frac{5}{6}$
14	Find the value of k, if $x = 1, y = 2$ is a solution of the equation $2x + 3y = k$. a) 5 b) 6 c) 7 d) 8
15	The total surface area of a cone whose radius is $r/2$ and slant height $2l$ is (A) $2\pi r(l+r)$ (B) $\pi r(l + \frac{r}{4})$ (C) $\pi r(l+r)$ (D) $2\pi rl$
16	From the given diagram below, which are the pairs of adjacent angles?  a) $\angle PQR$ and $\angle PQS$ b) $\angle PQR$ and $\angle SQR$ c) $\angle PQR$ and $\angle RQP$ d) $\angle PQS$ and $\angle SQR$
17	The base of an isosceles right triangle is 30 cm. Its area is (a) 225 cm^2 (b) $225\sqrt{3} \text{ cm}^2$ (c) $225\sqrt{2} \text{ cm}^2$ (d) 450 cm^2
18	Find the value of x, if AB is parallel to DE in the given figure:



- a. 45° b) 25° c) 55° d) 35°

19 **DIRECTION:** In question number 19 and 20, a statement of **assertion (A)** is followed by a statement of **Reason (R)**.
Choose the correct option

Assertion (A): The point $(-2, 0)$ lies on y-axis and $(0, 4)$ on x -axis.

Reason(R) : Every point on the x -axis has zero distance from x -axis and every point on the y-axis has zero distance from y-axis.

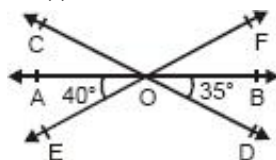
- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)
 (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)
 (c) Assertion (A) is true but reason (R) is false.
 (d) Assertion (A) is false but reason (R) is true.

20 **Assertion(A) :** $y = 3x$ represents a line passing through the origin.
Reason (R): Any line parallel to the x-axis is $y = a$.

- (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 and reason for (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.

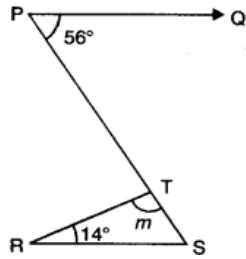
SECTION B
Section B consists of 5 questions of 2 marks each.

21 In the given figure, lines AB, , CD and EF intersect at O. Find the measure of $\angle COF$.



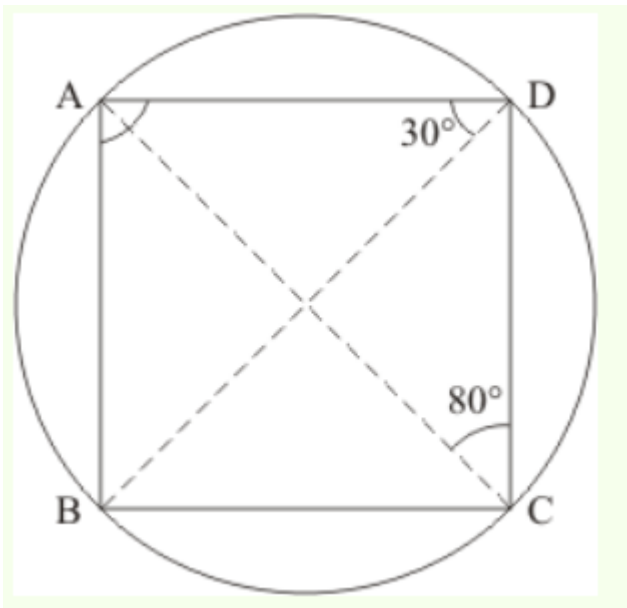
OR

In the given figure, if $PQ \parallel RS$, then find the measure of angle m .

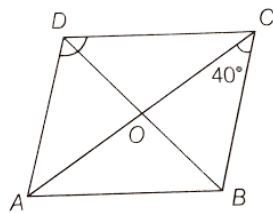


22 The radii of two cones are in the ratio of 2:3 and their heights are in the ratio of 7:3. Find the ratio of their volumes.

23 In the given figure, ABCD is a cyclic quadrilateral such that $\angle ADB = 30^\circ$ and $\angle DCA = 80^\circ$, then find the measure of $\angle DAB$



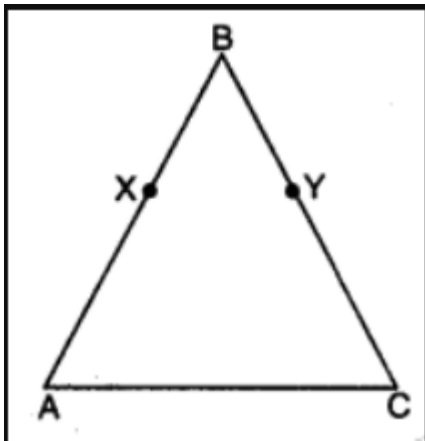
24 ABCD is a rhombus such that $\angle ACB = 40^\circ$ then find the measure of $\angle ADB$.



OR

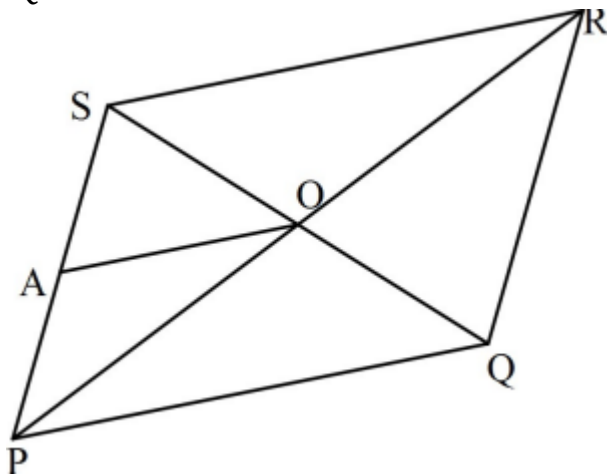
Calculate all the angles of a parallelogram if one of its angles is twice its adjacent angle.

25 In the given figure, $AB = BC$, $BX = BY$, show that
 $AX = CY$.

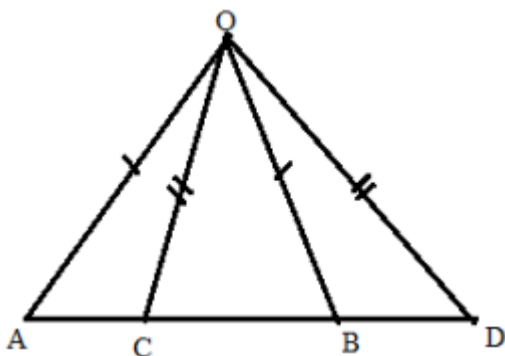


SECTION C
Section C consists of 6 questions of 3 marks each.

- 26 The diagonals PR and QS of a parallelogram PQRS intersect at O. If A is the mid-point of PS, prove that AO is parallel to PQ.

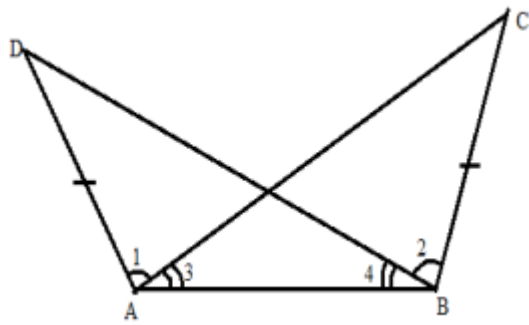


- 27 In the figure, $OA=OB$, $OC=OD$ and $\angle AOB=\angle COD$. Prove that $AC = BD$



OR

In figure, $\triangle ABC \cong \triangle ABD$ are such that $AD=BC$, $\angle 1=\angle 2$ and $\angle 3=\angle 4$. Prove that $BD = AC$.



- 28 Give an example of each, distinct two irrational numbers whose
- 1) Difference is a rational number
 - 2) Sum is a rational number
 - 3) Quotient is a rational number

OR

Express 1) 18.484848.....

2) 3.7999999..... in the form $\frac{p}{q}$

- 29 Write the answer to each of the following questions:

- (i) What is the name of the horizontal and the vertical lines drawn to determine the position of any point in the Cartesian plane?
- (ii) What is the name of each part of the plane formed by these two lines?
- (iii) Write the name of the point where these two lines intersect

- 30 Find the value of k for which the point $(1, -2)$ lies on the graph of the linear equation $x - 2y + k = 0$. Hence, find two more solutions of the equation.

- 31 Simplify
 $(2x - 5y)^3 - (2x + 5y)^3$.

SECTION D

Section D consists of 4 questions of 5 marks each

- 32 Find a and b so that the polynomial $x^3 - 10x^2 + ax + b$ is exactly divisible by the polynomials $(x - 1)$ and $(x - 2)$.

- 33 If $a = \frac{3+\sqrt{5}}{2}$, then find the value of $\left(a^2 + \frac{1}{a^2}\right)$

- 34 If two intersecting chords of a circle make equal angles with the diameter passing through their point of intersection, prove that the chords are equal
- OR**
- Prove that the angle subtended by an arc at the centre is double the angle subtended by

it at any point on the remaining part of the circle.

- 35 Tarini went to a stationary shop and purchased 4 pencils and 8 erasers for ₹ 40. Write a linear equation in two variables to represent this statement and draw its graph.

SECTION E
Case study based questions are compulsory.

- 36 Mathematics teacher of a school took her 9th standard students to show Red fort. It was a part of their Educational trip. The teacher had an interest in history as well. She narrated the facts of Red fort to students. Then the teacher said in this monument one can find a combination of solid figures. There are 2 pillars which are cylindrical in shape. Also 2 domes at the corners which are hemispherical. 7 smaller domes at the centre. Flag hoisting ceremony on Independence Day takes place near these domes.



- i) How much cloth material will be required to cover 2 big domes each of radius 2.5 metres?
ii) How much is the volume of a hemisphere if the radius of the base is 3.5 m?
iii) What is the ratio of sum of volumes of two hemispheres of radius 1 cm each to the volume of a sphere of radius 2 cm?

OR

- iii) Write the formula for surface area and volume of hemisphere .

- 37 A stopwatch was used to find the time that it took a group of jockey to run 1000 m. race.



Time (in seconds)	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Number Of Participants (Jockey)	8	10	13	6	3

- (i) How many participants finished the race within 1 minute? (1 mark)
(ii) The Class mark of the class interval during which least number of participants(jockey) completed the race is _____ (1 mark)
(iii) In which Class Interval 40 (seconds) is included? The upper class limit of the smallest class interval is _____ (2 marks)

OR

- (iii) Formula to calculate adjusted frequency is _____ and formula to calculate class mark is _____.



- a) If front of tent has triangular entrance which is equilateral triangle of side length 4 m. What is the area covered by the entrance? (1 mark)
- b) The side lengths of the triangular back of the tent are 8 m, 8m and 7cm. What is the area of triangular back. (2 marks)
- OR**
- b) Write the herons formula for scalene and equilateral triangle.
- c) Find the area of tent material for 3 sides of the tent having the same measure as the back side of the tent. (1 mark)