ATUL CLASSES

S.C.O.3 SOHI COMPLEX BALTANA(ZIRAKPUR), 8968103999

Test / Exam Name: Atul Classes **Standard: 9th** **Subject: Mathematics**

Student Name: ..... **Section:** ..... **Roll No.:** .....

Questions: 40 **Time: 01:00 hh:mm** **Marks: 228**

Q1. In the adjoining figure, ABCD is a parallelogram in which $\angle A = 60^\circ$. If the bisectors of $\angle A$ and $\angle B$ meet DC at P, prove that **8 Marks**

1. $\angle APB = 90^\circ$,
2. AD = DP and PB = PC = BC,
3. DC = 2AD.

Q2. In the adjoining figure, ABCD is a || gm in which E and F are the midpoints of AB and CDrespectively. If GH is a line segment that cuts AD, EF and BC at G, P and H respectively, prove that GP = PH. **7 Marks**

Q3. Show that the quadrilateral formed by joining the midpoints of the pairs of adjacent sides of a square is a square. **7 Marks**

Q4. The diagonals of a quadrilateral ABCD are perpendicular to each other. Prove that the quadrilateral formed by joining the midpoints of its sides is a rectangle. **7 Marks**

Q5. In the adjoining figure, ABCD is a trapezium in which AB || DC and P, Q are the midpoints of AD and BC respectively. DQ and AB when produced meet at E. Also, AC and PQintersect at R. Prove that: **7 Marks**

1. DQ = QE,
2. PR || AB,
3. AR = RC.

Q6. The diagonals of a quadrilateral ABCD are equal. Prove that the quadrilateral formed by joining the midpoints of its sides is a rhombus. **7 Marks**

Q7. The midpoints of the sides AB, BC, CD and DA of a quadrilateral ABCD are joined to form a quadrilateral. If AC = BD and $AC \perp BD$ then prove that the quadrilateral formed is a square. **7 Marks**

Q8. In the adjoining figure, ABCD is a parallelogram in which $\angle BAO = 35^\circ$, $\angle DAO = 40^\circ$ and $\angle COD = 150^\circ$. Calculate **6 Marks**

1. $\angle ABO$,
2. $\angle ODC$,
3. $\angle ACB$,
4. $\angle CBD$.

Q9. Show that the quadrilateral formed by joining the midpoints of the pairs of adjacent sides of a rhombus is a rectangle. **6 Marks**

Q10. In a || gm ABCD, if $\angle A = (2x + 25)^\circ$ and $\angle B = (3x - 5)^\circ$, find the value of x and the measure of each angle of the parallelogram. **6 Marks**

Q11. In a parallelogram ABCD, E and F are the mid-points of sides AB and CD respectively. Show that the line segments AF and EC trisect the diagonal BD. **6 Marks**

Q12. In the adjoining figure, ABCD is a quadrilateral and AC is one of its diagonals. Prove that: **6 Marks**
(i) AB + BC + CD + DA > 2AC

(ii) AB + BC + CD > DA

(iii) AB + BC + CD + DA > AC + BD

Q13. A $\triangle ABC$ is given. If lines are drawn through A, B, C, parallel respectively to the sides BC, CA and AB, forming $\triangle PQR$, as shown in the adjoining figure, show that $BC = \frac{1}{2}QR$. **6 Marks**

Q14. Each side of a rhombus is 10cm long and one of its diagonals measures 16cm. Find the length of the other diagonal and hence find the area of the rhombus. **6 Marks**

Q15. In the adjoining figure, $\triangle ABC$ is a triangle and through A, B, C, lines are drawn, parallel respectively to BC, CA and AB, intersecting at P, Q and R. Prove that the perimeter of $\triangle PQR$ is double the perimeter of $\triangle ABC$. **6 Marks**

Q16. K, L, M and N are points on the sides AB, BC, CD and DA respectively of a square ABCD such that AK = BL = CM = DN. Prove that KLMN is a square. **6 Marks**

Q17. In the adjoining figure, ABCD is a parallelogram. If P and Q are points on AD and BCrespectively such that $AP = \frac{1}{2}AD$ and $CQ = \frac{1}{2}BC$, prove that AQCP is a parallelogram. **6 Marks**

Q18. Show that the quadrilateral formed by joining the midpoints of the pairs of adjacent sides of a rectangle is a rhombus. **6 Marks**

Q19. ABCD is a rectangle in which diagonal AC bisects $\angle A$ as well as $\angle C$. Show that: **6 Marks**

1. ABCD is a square
2. diagonal BD bisects $\angle B$ as well as $\angle D$.

Q20. In each of the figures given below, ABD is a rectangle. Find the values of x and y in each case. **6 Marks**

Q21. In each of the figures given below, ABCD is a rhombus. Find the value of x and y in each case. **6 Marks**

Q22. Two parallel lines l and m are intersected by a transversal t. Show that the quadrilateral formed by the bisectors of interior angles is a rectangle. **6 Marks**

Q23. If an angle of a parallelogram is four-fifths of its adjacent angle, find the angles of the parallelogram. **5 Marks**

Q24. If ABCD is a rectangle with $\angle BAC = 32^\circ$, find the measure of $\angle DBC$. **5 Marks**

Q25. In a parallelogram PQRS, PQ = 12cm and PS = 9cm. The bisector of $\angle P$ meets SR in M. PM and QR both when produced meet at T. Find the length of RT. **5 Marks**

Q26. Read the Source/ Text given below and answer these questions: **5 Marks**

A class teacher gave students coloured paper in the shape of a quadrilateral. She asks him to make a parallelogram from it using paper folding.

1. One angle of a quadrilateral is 108° and the remaining three angles are equal, then each of the three equal angles:
1. 90°
2. 74°
3. 84°
4. 72°
2. How can a parallelogram be formed by using paper folding?
1. By finding diagonals of the quadrilateral.
2. By joining mid pts. of sides of a quadrilateral.
3. By finding angle bisectors.
4. None of these.

The quadrilateral formed by joining the mid-points of the sides of a quadrilateral PQRS, taken in order, is a rectangle, if:

1. PQRS is a rectangle.

2. PQRS is a parallelogram.
3. diagonals of PQRS are perpendicular.
4. diagonals of PQRS are equal.

3. In the figure, ABCD and AEFG are two parallelograms. If $\angle \mathrm{C} = 60^{\circ}$, then $\angle \mathrm{F}$ is:
1. 30°
2. 60°
3. 90°
4. 120°
4. Which of the following is not true for a parallelogram?
1. Opposite sides are equal.
2. Opposite angles are equal.
3. Opposite angles are bisected by the diagonals.
4. Diagonals bisect each other.
5. The angles of the quadrilateral are in the ratio 2 : 5 : 4 : 1? Which of the following is true?
1. The largest angle in the quadrilateral is 150°.
2. The smallest angle is 30°.
3. The second-largest angle in the quadrilateral is 80°.
4. Both the largest angle in the quadrilateral is 150° and The smallest angle is 30°.

Q27. If PQRS is a square, then write the measure of $\angle \mathrm{SRP}$. **5 Marks**

Q28. In the given figure, ABCD is a square and $\angle \mathrm{PQR} = 90^{\circ}$. If PB = QC = DR, prove that: **5 Marks**
1. QB = RC,
2. PQ = QR,
3. $\angle \mathrm{QPR} = 45^{\circ}$

Q29. Prove that the line segments joining the midpoints of opposite sides of a quadrilateral bisect each other. **5 Marks**

Q30. Read the Source/ Text given below and answer these questions: **5 Marks**

Sohan wants to show gratitude towards his teacher by giving her a card made by him. He has three pieces of trapezium pasted one above the other as shown in fig. These pieces are arranged in a way that AB || HC || GD || FE. Also BC = CD = DE and AH = HG = GF = 6cm. He wants to decorate the card by putting up a colored tape on the nonparallel sides of the trapezium.

1. Find the total length of colored tape required if DE = 4cm.
1. 20cm
2. 30cm
3. 40cm
4. 50cm
2. ABHC is a trapezium in which AB || HC and $\angle \mathrm{A} = \angle \mathrm{B} = 45^{\circ}$. Find angles C and H of the trapezium.
1. 135, 130
2. 130, 135
3. 135, 135
4. 130, 130
3. What is the difference between trapezium and parallelogram?
1. Trapezium has 2 sides, and parallelogram has 4 sides.
2. Trapezium has 4 sides, and parallelogram has 2 sides.
3. Trapezium has 1 pair of parallel sides, and parallelogram has 2 pairs of parallel sides.
4. Trapezium has 2 pairs of parallel sides, and parallelogram has 1 pair of parallel sides.
4. Diagonals in isosceles trapezoid are _____.
1. parallel.
2. opposite.
3. vertical.
4. equal.
5. ABCD is a trapezium where AB || DC, BD is the diagonal and E is the midpoint of AD. A line is drawn through E parallel to AB intersecting BC at F. Which of these is true?
1. BF = FC

2. EA = FB
3. CF = DE
4. None of these

Q31. Read the Source/ Text given below and answer these questions: **5 Marks**

There is a Diwali celebration in the DPS school Janakpuri New Delhi. Girls are asked to prepare Rangoli in a triangular shape. They made a rangoli in the shape of triangle ABC. Dimensions of $\triangle \mathrm{ABC}$ are 26cm, 28cm, 25cm.

1. In fig, R is mid-point of AB and RQ || BC then AQ is equal to:

1. BC
2. RB
3. QC
4. AD

2. In fig R and Q are mid-points of AB and AC respectively. The length of RQ is:

1. 14
2. 13
3. 12.5
4. 13.5

3. If Garland is to be placed along the side of $\triangle \mathrm{QPR}$ which is formed by joining midpoint, what is the length of garland:

1. 79cm
2. 39.5cm
3. 35cm
4. 79.5cm

4. In the following figure R, P and Q are the mid-points of AB, BC, and AC respectively. Which of the following is the area of $\triangle \mathrm{PQR}$?

1. $\frac{1}{2}\mathrm{ar}\ (\mathrm{ABC})$
2. $\frac{1}{3}\mathrm{ar}\ (\mathrm{ABC})$
3. $\frac{1}{4}\mathrm{ar}\ (\mathrm{ABC})$
4. $\frac{1}{6}\mathrm{ar}\ (\mathrm{ABC})$

5. R, P, Q are the mid-points of corresponding sides AB, BC, CA in $\triangle \mathrm{ABC}$ the figure so obtained BPQR will be:

1. Parallelogram.
2. Trapezium.
3. Quadrilateral.
4. None of these.

Q32. Read the Source/ Text given below and answer any four questions: **5 Marks**

During Maths Lab Activity each student was given four broomsticks of lengths 8cm, 8cm, 5cm, 5cm to make different types of quadrilaterals.

Using the above information answer the following questions:

1. How many quadrilaterals can be formed using these sticks?

1. Only One type of quadrilaterals can be formed.
2. Two types of quadrilaterals can be formed.
3. Three types of quadrilaterals can be formed.
4. Four types of quadrilaterals can be formed.

2. Name the types of quadrilaterals formed:

1. Rectangle, parallelogram, kite.
2. Rectangle, parallelogram, Trapizum.
3. Rectangle, parallelogram, Square.
4. Rectangle, Square, kite.

3. In a trapezium ABCD, DC || AB and $\angle \mathrm{A} = \angle \mathrm{B} = 45^{\circ}$, the teacher asked the student to find $\angle \mathrm{D}$. Naresh answered it is _____.

1. 105°
2. 108°
3. 135°
4. 125°

4. While discussing the properties of a parallelogram teacher asked about the relation between two angles x and y of a parallelogram as shown in fig. The teacher gave them 4 options as (if BC < CD):

1. x > y
2. x < y
3. x = y
4. None of these.

5. P, Q, R, and S are respectively the mid-points of sides AB, BC, CD, and DA of quadrilateral ABCD in which AC = BD and $\mathrm{AC} \perp \mathrm{BD}, \mathrm{PQRS}$, is a:

1. Square.
2. Rhombus.
3. Kite.
4. Parallelogram.

Q33. Find the measure of each angle of a parallelogram, if one of its angles is 30° less than twice the smallest angle. **5 Marks**

Q34. In the adjoining figure, ABCD is a square. A line segment CX cuts AB at X and the diagonal BD at O such that $\angle \mathrm{COD} = 80^{\circ}$ and $\angle \mathrm{OXA} = \mathrm{x}^{\circ}$. Find the value of x. **5 Marks**

Q35. Prove that the line segments joining the middle points of the sides of a triangle divide it into four congruent triangles. **5 Marks**

Q36. Show that if the diagonals of a quadrilateral bisect each other at right angles, then it is a rhaombus. **5 Marks**

Q37. In the adjoining figure, ABCD is a parallelogram in which $\angle \mathrm{DAB} = 80^{\circ}$ and $\angle \mathrm{DBC} = 60^{\circ}$. Calculate $\angle \mathrm{CDB}$ and $\angle \mathrm{ADB}$. **5 Marks**

Q38. Read the Source/ Text given below and answer any four questions: **5 Marks**

Chocolate is in the form of a quadrilateral with sides 6cm and 10cm, 5cm and 5cm(as shown in the figure) is cut into two parts on one of its diagonal by a lady. Part-I is given to her maid and part II is equally divided among a driver and gardener.

1. Length of BD:
1. 9cm
2. 8cm
3. 7cm
4. 6cm

2. Area of $\triangle \mathrm{ABC}$:
1. 24cm^2
2. 12cm^2
3. 42cm^2
4. 21cm^2

3. The sum of all the angles of a quadrilateral is equal to:
1. 180°
2. 270°
3. 360°
4. 90°

4. A diagonal of a parallelogram divides it into two congruent:
1. Square.
2. Parallelogram.
3. Triangles.
4. Rectangle.

5. Each angle of the rectangle is:
1. More than 90°
2. Less than 90°
3. Equal to 90°
4. Equal to 45°

Q39. The lengths of the diagonals of a rhombus are 24cm and 18cm respectively. Find the length of each side of the rhombus. **4 Marks**

Q40. ABCD is a rhombus. Show that diagonal AC bisects $\angle \mathrm{A}$ as well as $\angle \mathrm{C}$ and diagonal BD bisects $\angle \mathrm{B}$ as well as $\angle \mathrm{D}$. **4 Marks**