Q1/ Defined all the following:- (10 M)

1) Axiom 2) Coaxial circles 3) Finite geometry 4) Multilateral figure 5) Model

Q2/A/ Find left and right parallel lines of **Hyperbolic** line

$g: x^2 + y^2 - 5x = -6$ and point $p(-1,4)$. (5M)

B/ Find **Elliptic** line equation passing through two points $A(7,4,\frac{1}{4})$

and $B(3,1,\frac{1}{6})$. (5M)

Q3/ Find the inverse of the circle $x^2 + y^2 = 10$ by the inversion circle

$W: x^2 + y^2 - 2x + 6y = 8.$ (8M)

Q4/ A/ State properties of Axiomatic system. (6M)

B/ prove that in **Fano's** geometry, two distinct lines have exactly one

point in common. (6M)

Q5/A/ Show that in the **Euclidean** system, how to cut a given finite straight line? (6M)

B/ Show that the radical axis of two intersecting circles is an extension

of the joint chord of two circles. (6M)

Q6/ How **Abhary** tried to prove **E5A** in the case the internal angles are

obtuse and **acute** angles? Explain your answer. (8M)

Q1/ A/ state all **Axioms** of **Euclidean System.** (5M)

B/ prove that in **Euclidian** system if two straight lines cut one another, then they make the vertically opposite angles equal to one another. (5M)

Q2/ A/ prove that in **four point** geometry, have exactly six lines. (6M)

B/ find the inverse of line $y - x = -3$ by the inversion circle

$W: x^2 + y^2 - 6x = 1$ (6M)

Q3/ A/ find **Hyperbolic** line equation between two points A(2,5) and B(2,8), after that find **Hyperbolic** distance AB. (8M)

B/ Find **Elliptic** distance between points (6,-1) and (3,5) on xy-plane. (7M)

Q4/ Use axioms of **connection** for the **Hilbert** system to prove that every two different lines on the plane are associates with a just point or not. (6M)

Q5/ State **Playfiar's** Axiom, and use it to prove **E5A**. (7M)

Q6/ prove that in a **quadrilateral** if three angles are right angle therefore, the fourth angle is also right angle. (10M)

Q1/ A/ choose a correct answer. (4 M)

1) Figure which all sides equal and opposite sides parallel is called ---------.
   {**parallelogram, rhombus, trapezium, rectangle}**
2) **Sector** is a fraction of a circle between ------------------.
   { **chord and arc, chord and 2 radii, arc and 2 radii, chord and diameter}**
3) The sum if interior angles of **Decagon** figure is -----------.
   {1440, 1620, 1800, 1260}
4) An Axiomatic system is ---------- if it is impossible to add any axioms or undefined terms.
   { Consistency, Independence, Completeness, Model}

B/ defined the following (2 M)

1) **Axiomatic system**

2) Intersecting lines.

Q2/ How Euclid proved this proposition **(to cut a given rectilinear angle in half)?** (5M)

Q1/ Prove Euclid's fifth Axiom in this way **the two internal angles are acute**, by **Abhary's** way**?** (5M)

Q2/ Radical axis of two intersection circles is extension the joint chord for two circles. (5M)

Q3/ show that Elliptic circles intersection with each other**.** (4 m)

Q1/ A/ choose a correct answer.

1) --------------- Angles that are between parallel lines, but on opposite sides of a transversal.

{ **vertical angles, angle bisector, alternative angles, acute angle**}

2) --------------- is a line segment with both endpoints on the circle.

{ **chord, diameter , radius, circumference** }

3) ---------------- is a figure with 7 sides, 7 vertices, and 14 diagonals.

{ **hexagon, octagon, heptagon, pentagon**}

4) ------------ is the area enclosed by a chord and arc for a circle.

{ **sector , tangent, arc, segment**}

B/ show that how **to cut a given rectilinear angle in half**. (6 m)

Q3/ find the inverse of line L: $3x - y = 5$ by the inversion circle W: $x^2 + y^2 + 12x - 8y = 1$. (5M)

Q1/A/ Show that $\boldsymbol{x(y-x) = xy - x^2}$ by Babylonian's geometry. **(**4 Marks)

B/ Define each of the following:- (12 Marks)

1) Axiomatic system, 2) Semi-circle, 3) Coaxial circle,
4) Hyperbolic axiom, 5) Dedekind's axiom, 6) Finite geometry.

Q2/A/ Show that the cross ratio $\{\boldsymbol{AB.DC}\} = \frac{\mathbf{1}}{\{\boldsymbol{AB.CD}\}}$. (4 Marks)

B/ Show that Hyperbolic circles does not intersects with each other. (6 Marks)

Q3/ A/ Find the inverse of the line $\boldsymbol{x - 2y = 1}$ by the inversion circle $\boldsymbol{W}: \boldsymbol{x^2 + y^2 + 6x + 4y = 3}$. (6 Marks)

B/ Find all parallel line equations of two Hyperbolic lines $\boldsymbol{g_1}: \boldsymbol{2x^2 + 2y^2 - 12x - 14 = 0}$ *and* $\boldsymbol{g_2}: \boldsymbol{x^2 + y^2 + 2x = 0}$. (6 Marks)

Q4/ A/ How Euclid proved this proposition (To describe an equilateral triangle on a given finite straight line). (5 Marks)

B/ Let $\boldsymbol{ABCD}$ be a Khayyam quadrilateral, such that AB forms the base, $\boldsymbol{AD}$ and $\boldsymbol{BC}$ are sides and $\boldsymbol{AD = BC}$, $\boldsymbol{\measuredangle A = \measuredangle B = 90}$, and the Summit angles are $\boldsymbol{\measuredangle C}$ *and* $\boldsymbol{\measuredangle D}$, prove that $\boldsymbol{\measuredangle C = \measuredangle D}$. (6 Marks)

Q5/A/ Let $\boldsymbol{W}$ be a circle with center $\boldsymbol{O}$ and radius $\boldsymbol{K}$ and a point $\boldsymbol{P}$ different from $\boldsymbol{O}$, and the point $\boldsymbol{P}$ is the inverse of point $\boldsymbol{Q}$ on the ray $\boldsymbol{OP}$, prove that $\boldsymbol{OP.OQ = K^2}$. (6 Marks)

B/ Prove that in Four Point Geometry has exactly six lines. (5 Marks)