Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 07

B.Sc. (CS) (2013 & Onwards) (Sem.–2)

COORDINATE GEOMETRY

Subject Code : BCS-202

Paper ID : [A2606]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and students has to attempt any FOUR questions.**

SECTION–A

Q1) Answer briefly :

a) Prove that $x^2 + 6xy + 9y^2 + 4x + 12y - 5 = 0$ represents a pair of lines.

b) Find the equation of bisectors of the angles between the lines represented by $6x^2 - 13xy + 5y^2 = 3$.

c) Find the equation of the tangent to a $x^2 + y^2 = a^2$ at a point on it.

d) Define Pole and Polar of a circle.

e) Find the equation of radical axis of two circles.

f) Find vertex, focus and directrix of the parabola $5x^2 + 24y = 0$.

g) Prove that tangent and the normal at any point of an ellipse bisect the angle between the focal radii to that point.

h) Define Conjugate Hyperbola with example.

i) Find the equation of a directrix to the conic $\frac{l}{r} = 1 + e\cos\theta$.

j) Prove that the tangents at the ends of any chord meet on the diameter which bisects the chord.

SECTION-B

Q2) a) Find the angle through which axes be rotated so that the expression $ax^2 + 2hxy + by^2$ may become of the form $a'x^2 + b'y^2$.

b) Find the value of λ for which the two lines $3x^2 - 8xy + \lambda y^2 = 0$ are perpendicular to one another.

Q3) Explain Co-axial family of circles .Find the limiting points of the coaxial system of circles determined by $x^2 + y^2 - 6x - 4y + 3 = 0$ and $x^2 + y^2 + 10x + 4y - 1 = 0$.

Q4) a) If the Polars of any two points P and Q meet in R. Prove that the polar of R is the line PQ.

b) Find the equation of circle which passes through the points (-1, 1), (–2, 1) and (4, 3).

Q5) Trace the conic $9x^2 + 16y^2 + 24xy - 2x + 14y + 1 = 0$.

Q6) a) Prove that the locus of poles of normal chords of the parabola $y^2 = 4ax$ is $(x+2a)y^2 + 4a^3 = 0$.

b) Find the equation of the tangent to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ which makes an angle $60°$ with x -axis

Q7) a) Find the polar equation of a circle.

b) Prove that the tangent to a hyperbola makes with the asymptotes a triangle of constant area.