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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.