**B.Sc. DEGREE EXAMINATION, APRIL 2016.**

**I YEAR — I SEMESTER**

**Major Paper I — TRIGONOMETRY AND ANALYTICAL GEOMETRY OF TWO DIMENSIONS**

**Time : 3 hours Max. Marks : 75**

**SECTION A — (10 × 2 = 20 marks)**

**Answer any *TEN* questions.**

1. Give the expansions for *cosnθ* and *sinnθ* in terms of multiple angles of θ.
2. Give an expression for *sinθ* in terms *θ*.
3. Give the relations between circular and hyperbolic functions?
4. What is the period of hyperbolic tangent function?
5. Define logarithm of a complex number.
6. Find the value of Log(5 + 3i).
7. Give the Euler’s series.
8. Give the general form of Gregory’s series.
9. What is polar of a point with respect to a parabola?
10. Define conormal points of an ellipse.
11. What are concyclic points in an ellipse?
12. Give the equation of the locus of poles of chords of the parabola which subtend a right angle at the vertex.

**SECTION B — (5 × 5 = 25 marks)**

**Answer any *FIVE* questions.**

1. Prove that 
2. Express *sinh-1x* as a logarithmic function.
3. Separate into real and imaginary parts *tan-1(x + iy).*
4. Sum to n terms the series 
5. Derive the equation of the polar of the point *(x1, y1)* with respect to the ellipse .
6. If find an approximate value of *x.*
7. If prove that 

[P.T.O.]

**SECTION C — (3 × 10 = 30 marks)**

**Answer any *THREE* questions.**

1. Expand *sin3θ cos4θ* in terms of sines of multiples of *θ*.
2. Expand *cosh8θ* in terms of hyperbolic cosines of θ .
3. Show that .
4. Sum to n terms the series: 
5. Prove that a chord of an ellipse is divided harmonically by any point on it and its polar with respect to the ellipse.

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