

DATE: 12-04-2017

Reg. number

**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE-27**

**M.Sc. MATHEMATICS – II SEMESTER**

**SEMESTER EXAMINATION: APRIL 2017**

MT 8214: Complex Analysis

Time- 2 ½ hrs Max Marks-70

**This paper contains TWO printed pages**

**Answer any SEVEN questions from the following**

1. a) If  be analytic in a simple connected domain,  be a fixed in  andbe an
 path with initial point and terminal point in , then prove that the 
 is analytic in  and .

b) State and prove Cauchy’s theorem for a circular disk. (4+6)

1. a) Evaluate  where

b) State and prove Cauchy’s theorem for a triangle. (2+8)

1. State and prove Laurent’s theorem. (10)
2. a) Find the Laurent’s expansion of 

b) If be a radius of convergence of a power series then prove that the power
 series  has also the same radius of convergence, further if
 and  in  then also prove that  (3+7)

1. a) State and prove Cauchy’s Residue theorem.

b) State and prove Rouche’s theorem. (5+5)

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1. Evaluate :

i) 

ii) 

 (5+5)

1. a) Define Meromorphic function and give an example.

b) State and prove Hadmard’s three circles theorem. (2+8)

1. a) State and prove Schwartz Lemma.

b) State and prove Jensen’s formula. (5+5)

1. a) Determine the number of roots that lies in 

b) State and prove Maximum modulus theorem. (3+7)

1. a) State Poisson’s integral formula.

b) State and prove Poisson’s Jensen’s formula. (2+8)