

COURSE CODE - 6030502

M.PHIL DEGREE EXAMINATION - JAN 2009

M.PHIL (MATHS)

REAL AND COMPLEX ANALYSIS

(For Candidate Admitted from Calendar 2007 Onwards)

Time: 3 Hours

Max.Marks:100

Section – A

Answer ALL the Questions:

10 X 3 =30

1. Define Hausdorff space
2. Define lower semi continuous function
3. Define conjugate exponents
4. Define Cauchy sequence in $L^p(\mu)$
5. State the triangle inequality
6. State Jensen's inequality
7. Define convex set
8. State uniqueness theorem
9. Define normal linear space
10. State Cauchy's theorem in convex set

Section - B

Answer any FIVE Questions:

5 X 6 = 30

11. State and prove that Hahn Decomposition theorem
12. Explain the Jensen's inequality by an illustration
13. If ϕ is convex on (a, b) , then prove ϕ is continuous on (a, b) .
14. State and prove Inversion theorem
15. State and prove Fubini's theorem
16. State and prove Schynar's inequality
17. State and prove Holder's inequality
18. Prove that the total variation $|\mu|$ of a complex measure μ on m is a positive measure on m .

Section –C

Answer any TWO Questions:

2 X 20 = 40

19. State and prove Hahn Banach theorem
20. State and prove Plancherel theorem
21. State and prove the Cauchy theorem for a triangle.