**CBCS/ SEMESTER SYSTEM**

**(w.e.f. 2020-21 Admitted Batch)**

**B.A./B.Sc. MATHEMATICS COURSE-IV, REAL ANALYSIS**

**Time: 3Hrs Max.Marks:75M**

**SECTION - A**

**Answer any FIVE questions. Each question carries FIVE marks 5 X 5 M=25 M**

1.Prove that every convergent sequence is bounded.

2. Show that+------------------+ )=0.

3. Test the convergenceof the series.

4. Examine for continuity of the function *f* defined by at x=0 and 1.

5. Show that is continuous but not derivable at

x=0.

6.Verify Rolle’s theorem for the function f(x) = x3- 6x2+11x-6 on .

7. If then find L(p, f) and U(p, f).

8.prove that if is continuous on [a, b] then f is R- integrable on [a, b].

**SECTION –B**

**Answer ALL the questions. Each question carries TEN marks. 5 X 10 M = 50 M**

9.(a)If then show that { } converges.

(OR)

(b) State and prove Cauchy’s general principle of convergence.

10**.**(a) State and Prove Cauchy’s nth root test.

(OR)

(b) Test the convergence of ( .

11.(a) Let f: R be such that

f (x) =

= c for x= 0

=

Determine the values of a, b, c for which the function f is continuous at x=0.

(OR)

(b) Define uniform continuity, If a function f is continuous on [a b] then f is uniformly continuous on [ a b]

12**.**(a) Using Lagrange’s theorem, show that . (OR)

(b) State and prove Cauchy’s mean value theorem.

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13**.**(a) State and prove Riemman’s necessary and sufficient condition for R- integrability.

(OR)

(b) Prove that .