Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 07

M.Sc. Mathematics (2018 Batch) (Sem.-2)

REAL ANALYSIS-II

Subject Code : MSM-202-18

M.Code : 75963

Time : 3 Hrs. Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of FIVE questions carrying TWO marks each.**
2. **SECTION - B & C. have THREE questions each.**
3. **Attempt any FOUR questions from SECTION B & C carrying FIFTEEN marks each.**
4. **Select atleast TWO questions from SECTION - B & C each.**

SECTION-A

1. Write short notes on :

   a) State Littlewood's three principles.

   b) State implicit function theorem.

   c) Define Convex Functions.

   d) State the monotone convergence theorem.

   e) State Fatou's Lemma.

SECTION-B

2. State and prove the inverse function theorem.

3. a) If f = r almost everywhere, and f is a measurable function, then prove that g is also measurable.

   b) State and prove Egoroff's theorem.

4. a) If E_1 and E_2 are measurable then prove that $E_1 \cup E_2$ is measurable.

   b) Prove that the interval $[a, \infty]$ is measurable.

SECTION-C

5. a) Define Borel set. Give an example of a measurable set which is not a Borel set.

   b) State and prove classical Lebesgue dominated convergence theorem.

6. a) Every bounded Riemann Integrable function over [a,b] is Lebesgue Integrable and the two integrals are equal.

   b) Prove Fatou's lemma.

7. State and prove Lebesgue differentiation theorem.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.