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

Total No. of Questions : 07

M.Sc.(Mathematics) (2017 Batch) (Sem.–2)

REAL ANALYSIS-II

Subject Code : MSM-202

Paper ID : [75009]

Time : 3 Hrs. Max. Marks : 80

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of EIGHT questions carrying TWO marks each.
2. SECTION - B & C. have THREE questions in each section carrying SIXTEEN marks each.
3. Select atleast TWO questions from SECTION - B & C EACH.

SECTION-A

1. Answer briefly :

a) State the inverse function theorem.

b) Define Convex Functions.

c) When a function is said to be Borel measurable?

d) Show that a set consisting of one point is measurable and its measure is zero.

e) Prove that every continuous function is measurable.

f) State the monotone convergence theorem.

g) State littlewood's three principles

h) State Egoroff's theorem.

SECTION-B

2. State and prove the implicit function theorem.

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

   b) State and prove Lusin'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) Show that the monotone convergence theorem need not hold for decreasing sequences of functions.

   b) State and prove bounded convergence theorem.

6. a) State and prove Fatou's lemma.

   b) Prove that a function F is an indefinite integral iff it is absolutely continuous.

7. State and prove Lebesgue differentiation theorem.