

FMT-07
MSc (SECOND SEMESTER) EXAMINATION, 2021
MATHEMATICS
PAPER: VII
LEBESGUE MEASURE AND INTEGRATION-II

MAX MARKS: 35

Note: Attempt all the questions.

- Q 1. Prove that the following statements are equivalent:
- i. f is measurable function.
 - ii. $\forall \alpha, [x : f(x) \geq \alpha]$ is measurable
 - iii. $\forall \alpha, [x : f(x) < \alpha]$ is measurable function
 - iv. $\forall \alpha, [x : f(x) \leq \alpha]$ is measurable function
- Q 2. State and prove Lebesgue's dominated convergence theorem.
- Q 3. State and prove Lebesgue's differential theorem.
- Q 4. State and prove Minkowwsk's inequality.