TEZPUR UNIVERSITY
Assignment Spring 2020
MMS304: Advanced Analysis

Total Marks: 30

Each question carries 6 marks.
All questions are compulsory.
Answers should be concise and entire answer to a question should be together. State assumptions wherever made.

1. Prove that the Cantor set $\mathcal{C}$ has no interior points.
2. If E is a measurable set then prove that $E + x$ is also measurable for each real number x.
3. If f is a measurable function then prove that $|f|$ is also measurable. Is the converse true?
4. If f is a bounded measurable function defined on a set E of finite measure and $A \leq f(x) \leq B$, then prove that

$$A \cdot m(E) \leq \int_E f \leq B \cdot m(E)$$

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5. Prove that a measurable set A is positive with respect to a signed measure ν if $\nu(A \cap E) \geq 0$, for any measurable set E.

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