Subject : Mathematics

Teacher name: Archana Semester 4th

Name of the Paper : Paper 1

Class: MSc (Mathematics)

April 2021

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| Measures, some properties of measures, outer measures, extension of measures, uniqueness of extension, completion of a measure, the LUB of an increasingly directed family of measures.(Scope as in the Sections 3-6, 9-10 of Chapter 1 of the book ‘Measure and Integration’ by S.K.Berberian). Measurable functions, combinations of measurable functions, limits of measurable functions, localization of measurability, simple functions |

May 2021

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| Measure spaces, almost everywhere convergence, fundamental almost everywhere, convergence in measure, fundamental in measure, almost uniform convergence, Egoroff’s theorem, Riesz-Weyl theorem (Scope as in Chapter 3 of the book ‘Measure and Integration’ by S.K.Berberian). Integration with respect to a measure: Integrable simple functions, non-negative integrable functions, integrable functions, indefinite integrals, the monotone convergence theorem, mean convergence |

June 2021

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| Product Measures: Rectangles, Cartesian product of two measurable spaces, measurable rectangle, sections, the product of two finite measure spaces, the product of any two measure spaces, product of two σ - finite measure spaces; iterated integrals, Fubini’s theorem, a partial converse to the Fubini’s theorem (Scope as in Chapter 6 (except section 42) of the book ‘Measure and Integration’ by S.K.Berberian) Signed Measures: Absolute continuity, finite singed measure, contractions of a finite signed measure, purely positive and purely negative sets, comparison of finite measures, Lebesgue decomposition theorem, a preliminary Radon-Nikodym theorem, Hahn decomposition, Jordan decomposition, upper variation, lower variation, total variation, domination of finite signed measures, the Radyon-Nikodym theorem for a finite measure space, the Radon-Nikodym theorem for a σ - finite measure space |

July 2021

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| Integration over locally compact spaces: continuous functions with compact support, Gδ ‘s and Fσ’s, Baire sets, Baire function, Baire-sandwich theorem, Baire measure, Borel sets, Regularity of Baire measures, Regular Borel measures, Integration of continuous functions with compact support, Riesz-Markoff’s theorem |