

Preface

The work of the thesis was carried out at the University of North Bengal, West Bengal, India. The thesis contains seven chapters. The first chapter is based on the review of the earlier works in inflationary cosmology including the aims and objective of the thesis. Chapter 2 is based on the following two published works:

(i) **Probability for a primordial black hole pair in $1/R$ gravity**- D. Paul and B. C. Paul, *Phys. Rev. D* **72**, 064012 (2005).

(ii) **Probability of primordial black hole pair creation in a modified gravitational theory** - B. C. Paul and D. Paul, *Phys. Rev. D* **74**, 084015 (2006).

Chapter 3 is based on the article entitled: **Inflationary Universe with Tachyon field** - B. C. Paul and D. Paul, *Int. J. Mod. Phys. D* **14**, 1831 (2005).

Chapter 4 is based on the article entitled: **Anisotropic Bianchi-I universe with phantom field and cosmological constant** - B. C. Paul and D. Paul, *PRAMANA - A Journal of Physics* **71**, 1247 (2008).

Chapter 5 is based on the article entitled : **Inflation with hyperbolic Potential in the Brane-world model**

Chapter 6 is based on the article entitled: **Viscosity in Brane-World**