

TABLE OF CONTENTS

<u>CHAPTER I: L-CLASSES OF RATIONAL HOMOLOGY MANIFOLDS</u>	1
§1. Summary of results.....	3
§2. Preparatory material.....	6
(I) Homological properties of manifolds.....	6
(II) Milnor's definition of the L-class of a rational homology manifold.....	8
(III) The G-signature theorem.....	10
§3. Proof of the formula for $L(X/G)$	14
§4. A definition of $L(g, X)$ for rational homology manifolds.....	20
§5. The formula for $L(h', X/G)$	23
§6. Application to a formula of Bott and some remarks on $L(g, X)$...	25
 <u>CHAPTER II: L-CLASSES OF SYMMETRIC PRODUCTS</u>	32
§7. The rational cohomology of $X(n)$	34
§8. Statement and discussion of the formula for $L(X(n))$	40
TABLE: THE FUNCTION $Q_n(t)$ AND RELATED POWER SERIES.....	51
§9. The action of S_n on X^n	52
§10. The Gysin homomorphism of the diagonal map.....	59
§11. Preliminary formula for $L(X(n))$	63
§12. The dependence of $L(X(n))$ on n	67
§13. Symmetric products of spheres and of Riemann surfaces.....	71
§14. The equivariant case.....	77
§15. Equivariant L-classes for symmetric products of spheres.....	91
 <u>CHAPTER III: THE G-SIGNATURE THEOREM AND SOME ELEMENTARY NUMBER THEORY</u>	96
§16. Elementary properties of cotangent sums.....	100
§17. Group actions and Rademacher reciprocity.....	110
(I) A group action on projective space.....	110
(II) A group action on a hypersurface.....	113
§18. Equivariant signature of Brieskorn varieties.....	118
 REFERENCES.....	128