

INTRODUCTION TO ALGEBRAIC TOPOLOGY (MTH-507)

SURPRISE QUIZ (01/02/2018)

Time: 45 minutes

Maximum Marks: 10

**Attempt all questions. Use separate page for each answer.**

**Problem 1.** Show that  $\mathbb{R}^2$  and  $\mathbb{R}^n$  are not homeomorphic if  $n > 2$ . (4)

**Problem 2.** Let  $h : S^1 \rightarrow S^1$  be continuous and antipode-preserving with  $h(b_0) = b_0$ . Show that  $h_*$  carries a generator of  $\pi_1(S^1, b_0)$  to an odd power of itself. (6)