Roll : Time : 20 minutes

1. Express the total number of levels of an LSM tree in terms of total entries (N), size of an entry (E), buffer memory (M_{buffer}) and size ratio (T) with necessary proof. From this, explain the significance of the limiting value of T. **(8 Marks)**

2. Explain the mechanism of lookup and probing a run in an LSM tree (with bloom filter) in short. **(4 Marks)**

3. Discuss the cost model of two types of *LSM tree* **in short** and fill up the following table. You must express the cost orders in terms of the *size ratio* T and total number of entries (N). Consider both fence pointers and bloom filters are present. **(5 Marks)**

	Lookup Cost	**Update Cost**
Levelled LSM Tree		
Tiered LSM Tree		

4. List the key features of **Monkey** with very short details. **(4 Marks)**