National University of Computer and Emerging Sciences, Lahore Campus

Course:	**Design and Analysis of Algorithms**	**Course Code:**	**CS302**
Program:	**BS(Computer Science)**	**Semester:**	**Spring 2018**
Duration:	**10 Minutes**	**Total Marks:**	**10**
Paper Date:	**15-March-18**	**Weight**	**3**
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Exam:	**Quiz 3**	**Section:**	

Suppose you want to implement B-trees for indexing in a database. The block size of the disk is 1024 bytes, each data value and pointer pair is of 16 bytes, child pointer is of 4 bytes. Each node in the B-tree has a 4 byte integer to store the number of data items in the node and a 1 byte Boolean variable for isLeaf attribute. Given this information what should be the best suitable value of t? Show complete working for your answer.

As node size of B-tree must not exceed the block size, following relation must hold

$16(2t-1)+4(2t)+4+1<=1024$

$32t-16+8t+4+1<=1024$

$40t<=1035$

So $t = 25$