AQA Computer Science AS-Level

3.2.1 Data Structures and Abstract Data Types

Past Paper Mark Scheme

June 2017 Paper 1 Mark Scheme

05	5	**Marks are for AO1 (understanding)** static data structures have storage size determined at compile-time / before program is run / when program code is translated; dynamic data structures can grow/shrink during execution / at run-time; // Static data structures can waste storage space/memory if the number of data items stored is small relative to the size of the structure; whereas dynamic data structures only take up the amount of storage space required for the actual data; // Static data structures have fixed (maximum) size; whereas size of dynamic data structures can change; // Dynamic data structures (typically) require memory to store pointer(s) to the next item(s); which static data structures (typically) do not need; **NE.** Dynamic data structures use pointers // Static data structures (typically) store data in consecutive memory locations; which dynamic data structures (typically) do not;	2

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8	(a)		Static structures have fixed (maximum) size whereas size of dynamic structures can change // Size of static structure fixed at compile-time whereas size of dynamic structure can change at run-time; Static structures can waste storage space/memory if the number of data items stored is small relative to the size of the structure whereas dynamic structures only take up the amount of storage space required for the actual data; Dynamic data structures (typically) require memory to store pointer(s) to the next item(s) which static structures (typically) do not need // Static structures (typically) store data in consecutive memory locations, which dynamic data structures (typically) do not; **MAX 2** **A** just one side of points, other side is by implication **NE.** Dynamic data structures use pointers	2

8	**(b)**		Not possible to simply insert item into middle of list; Must move all items that should come after the new process down in the array; **NE** move all data Moving items is time consuming; In a dynamic implementation, insertion achieved by adjusting pointers; **MAX 2**	**2**	