AQA Computer Science A-Level

4.2.5 Trees

Past Paper Mark Scheme

June 2012 Comp 3 Mark Scheme

10	(a)		*Connected* // There is a path between each pair of vertices; *Undirected* // No direction is associated with each edge; *Has no cycles* // No (simple) circuits // No closed chains // No closed paths in which all the edges are different and all the intermediate vertices are different // No route from a vertex back to itself that doesn't use an edge more than once or visit an intermediate vertex more than once; **A** no loops **MAX 1** **Alternative definitions:** A simple cycle is formed if any edge is added to graph; Any two vertices can be connected by a unique simple path;	1

10	(b)		No route from entrance to exit / through maze; Maze contains a loop/circuit ; **A** more than one route through maze; Part of the maze is inaccessible / enclosed; **R** Responses that clearly relate to a graph rather than the maze **MAX 1**	1

June 2013 Comp 3 Mark Scheme

4	**(a)**		+; 4, 9, 6; (in any order)	**2**

4	**(b)**		A: Store the data/value (in the vertices/nodes); **A.** holds the expression B: Left pointer // points to the left child / left sub tree; C: Right pointer // points to the right child / right sub tree; **A** "indicates", "index" or other synonym for "points" / "pointer" **R.** Stores left/right subtree	**3**

4	**(c)**		The node has no left child / sub tree; **A** there is nothing to the left **A** this is a null pointer	**1**

4	(d)		One mark for each area outlined with a dark rectangle. Lines that are not outlined can be missed out. Alternative 1 Pos / Output 1 / 2 / 4 1 / 3 / 4 / 9 3 / 5 / 6 3 / * 1 / + Alternative 2 Pos / Output 1 / 4 2 / 9 1 / 6 3 / * 4 / + 3 / 5 / 3 / 1 / Mark against whichever alternative gives the highest mark. **Stop marking as soon as incorrect output is given.**	4

4	(e)		Post-order; **A.** Depth-first **A.** Depth-first search as BOD **TO.** Depth-first pre/in-order	1

4	(f)		(4 + 9 * 6 in) Reverse Polish (Notation) // Postfix (Notation) // RPN;	1

Specimen Paper 1 Mark Scheme

03	1	**Mark is for AO1 (understanding)** It contains a cycle / cycles;	1