	Assessment statement	Obj	Teacher's notes
5.1.13	Sketch linked lists (single, double and circular).	3	Students should be able to sketch diagrams illustrating: adding a data item to linked list, deleting specified data item, modifying the data held in the linked list, searching for a given data item.
Trees Binary trees will be examined at the level of diagrams and descriptions. Students are not expected to construct tree algorithms using pseudocode. Tracing and constructing algorithms are not expected.			
5.1.14	Describe how trees operate logically (both binary and non-binary).	2	**LINK** Recursive thinking.
5.1.15	Define the terms: parent, left-child, right-child, subtree, root and leaf.	1	These definitions only apply to a binary tree.
5.1.16	State the result of inorder, postorder and preorder tree traversal.	1	
5.1.17	Sketch binary trees.	3	Students should be able to sketch diagrams showing the resulting binary tree after adding a new data item, adding one or more new nodes, and/or removing one or more nodes.
Applications			
5.1.18	Define the term dynamic data structure.	1	
5.1.19	Compare the use of static and dynamic data structures.	3	**LINK** One-dimensional arrays.
5.1.20	Suggest a suitable structure for a given situation.	3	

Topic 6—Resource management (8 hours)

6.1 Resource management (8 hours)

	Assessment statement	Obj	Teacher's notes
System resources			
6.1.1	Identify the resources that need to be managed within a computer system.	2	Resources include: primary memory, secondary storage, processor speed, bandwidth, screen resolution, disk storage, sound processor, graphics processor, cache, network connectivity.

	Assessment statement	Obj	Teacher's notes
6.1.2	Evaluate the resources available in a variety of computer systems.	3	These should include: mainframes, servers, PCs, sub-laptops, as well as personal digital devices such as cell phones, PDAs and digital cameras. **AIM 9** Develop an appreciation of the issues linked to resource availability with continued developments in computer systems.
6.1.3	Identify the limitations of a range of resources in a specified computer system.	2	For example, single processor computers may not be able to render 3D graphics effectively.
6.1.4	Describe the possible problems resulting from the limitations in the resources in a computer system.	2	For example, user time wasted if the primary memory is too small or processor speed inadequate. Multi-access and multi-programming environments should be considered as well as single-user systems.
Role of the operating system			
6.1.5	Explain the role of the operating system in terms of managing memory, peripherals and hardware interfaces.	3	For example, allocating storage and keeping track of programs in memory, swapping between programs on time-slicing, priority or when one is waiting for input.
6.1.7	Outline OS resource management techniques: scheduling, policies, multitasking, virtual memory, paging, interrupt, polling.	2	Technical details as to how these are carried out will not be required, but it is expected that students will be familiar with these techniques and understand when and why they are used.
6.1.8	Discuss the advantages of producing a dedicated operating system for a device.	3	Advantages related to size, speed and customization should be considered. For example, using a dedicated operating system for a cell phone rather than using a pre-existing operating system. **S/E** Issue of proprietary software.

	Assessment statement	Obj	Teacher's notes
6.1.9	Outline how an operating system hides the complexity of the hardware from users and applications.	2	Students should be aware of a range of examples where operating systems virtualize real devices, such as drive letters, virtual memory, input devices, the Java virtual machine. **INT** Issue of localization causing compatibility problems between systems in different countries.

Topic 7—Control (14 hours)

7.1 Control (14 hours)

	Assessment statement	Obj	Teacher's notes
Centralized control systems			
7.1.1	Discuss a range of control systems.	3	A variety of control systems should be examined such as automatic doors, heating systems, taxi meters, elevators, washing machines, process control, device drivers, domestic robots, GPS systems, traffic lights and other common devices. Technical knowledge of specific systems is not expected but students should be able to analyse a specified system. **AIM 9** Develop an appreciation of the possibilities for control systems with developments in computer systems.
7.1.2	Outline the uses of microprocessors and sensor input in control systems.	2	These should be related to the examples suggested above.
7.1.3	Evaluate different input devices for the collection of data in specified situations.	3	Scenarios will be based on familiar situations to students.
7.1.4	Explain the relationship between a sensor, the processor and an output transducer.	3	Technical hardware details are not expected.
7.1.5	Describe the role of feedback in a control system.	2	**LINK** Connecting computational thinking and program design.