

# UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

## MARK SCHEME for the June 2005 question paper

### 9691 COMPUTING

9691/01

Paper 1 (Written Paper 1), maximum raw mark 90

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

- CIE will not enter into discussion or correspondence in connection with these mark schemes.

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**Grade thresholds** for Syllabus 9691/01 (Computing) in the June 2005 examination.

	maximum mark available	minimum mark required for grade:		
		A	B	E
Component 1	90	65	62	35

The thresholds (minimum marks) for Grades C and D are normally set by dividing the mark range between the B and the E thresholds into three. For example, if the difference between the B and the E threshold is 24 marks, the C threshold is set 8 marks below the B threshold and the D threshold is set another 8 marks down. If dividing the interval by three results in a fraction of a mark, then the threshold is normally rounded down.

**JUNE 2005**

A AND AS LEVEL

**MARK SCHEME**

**MAXIMUM MARK: 90**

**SYLLABUS/COMPONENT: 9691/01**

**COMPUTING**  
**Written Paper 1**



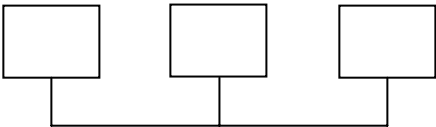
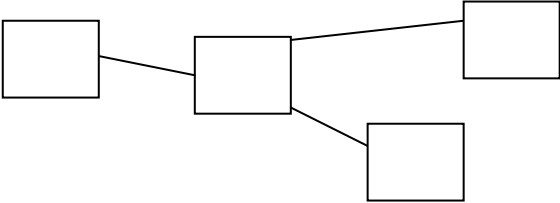
Page 1	Mark Scheme	Syllabus	Paper
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- 1 (a)(i)** Program that can be:
- used in many different situations/to do something useful/task which would need to be done if no computer available/accept a generic example. **Max [1]**
- (ii)** • Program which runs/controls the computer/hardware/Provides interface between user and hardware. **Max [1]**
- (b)**
- User interface, -to allow communication/type of interface
  - File handling, -to allow use of secondary storage
  - Disk management, -defragmenting/formatting/storage/...
  - Virus protection, -to protect files on secondary storage
  - Security, -backup procedures
  - Privacy, -logons/passwords/...
  - Access to peripheral devices, -via drivers/allowing hard copy/...
  - Memory management/to control the way that primary memory is used
  - Manages application software/installation to system/access to memory/...
  - Resource allocation/processor/printer time/...
- Not: Hides the complexity, this is too general and not a feature.  
(2 per pair, max 6) **[6]**
- 2 (a)**
- ROM cannot be altered, RAM can.
  - ROM is not volatile, RAM is.
  - ROM is normally smaller capacity than RAM
- (1 per -, max 2) **[2]**
- (b) (i)**
- Data in use/software in use/ part of operating system
  - Processor can only use what is stored in RAM/not needed for long **[2]**
- (ii)**
- Bootstrap/boot loader/loader/startup program
  - It must be available when the computer is switched on/must not be altered **[2]**
- 3 (a)** Mark points:
- Start point/head of list table
  - Data in alphabetic order
  - Pointers used properly
  - Null pointer to terminate
  - Evidence of free space
- (1 per -, max 4) **[4]**
- (b)**
- Find correct list in head of lists table
  - follow pointer to data
  - If data = THEO then report found, End
  - If data > THEO then report error, THEO not present, End
  - If pointer = null then report error, THEO not present, End
- Repeat from line 2.  
Give 1 mark for the correct use of 'End' twice.  
(1 per -, max 4) **[4]**

Page 2	Mark Scheme	Syllabus	Paper
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- 4 (a) -Hardware attached to processor/computer  
 (i) -to supply data to processor/computer  
 (ii) -to relay information from the processor/computer  
 (1 per -, max 2) [2]
- (b) Note: All these mark points are from the point of view of the ATM. Equivalent points acceptable from the point of view of a Qwerty keyboard.  
 ATM:  
 -Only runs one software  
 -Restricted characters  
 -Fewer keys...  
 -simplifies input required...  
 -fewer mistakes on input  
 -Meaning of key alters according to place in sequence  
 -Use of output device to explain meaning of keys  
 -Braille characters on keys  
 -to allow blind people to use ATM  
 -Keys are touch sensitive  
 -Protected from elements/vandalism  
 -Made of more resilient material because of position/volume of use/users.  
 (1 per -, max 6) [6]
- (c) Batch:  
 -Collect together records of transactions for later processing/requests for statements  
 -when computer use not so heavy...  
 -otherwise would be continually interrupted.  
 Real time:  
 -Checking of PIN/identification  
 -Checking of funds available  
 -to ensure person has the right to extract cash, or long wait is possible.  
 (1 per -, max 2 per type, max 4) [4]

Page 3	Mark Scheme	Syllabus	Paper
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- 5 (a)(i) -The machine readable version of the code or intermediate code/machine code version for the machine on which it is to be run
- (ii) -The original code as programmed in HLL / assembly language [2]
- (b) -Translator program turns source into object  
-spots some of the errors in the source code  
-reports errors to user  
(1 per -, max 2) [2]
- (c)(i) -A small program/subprogram  
-to do a defined task  
-Is called by a name/identifier  
(1 per -, max 2) [2]
- (ii) -User selection from menu is compared with possibilities  
-each possibility gives the name of a procedure  
-which is run if possibility chosen  
-procedure is code which carries out user desires.  
(1 per -, max 3) [3]
- 6 (a)(i)  [1]
- (ii)  [1]
- (b) Advs:  
-Files can be accessed from any machine  
-Data can be shared  
-Software can be shared  
-Peripherals can be shared  
-Communication across network  
Dis:  
-Security of data files less certain  
-Failure of part of network may affect the rest.  
Not: Installing software is easier/quicker.  
(1 per-, max 3 advs, max 1 disadv, max 4) [4]

Page 4	Mark Scheme	Syllabus	Paper
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- 7
- Processor fills buffer with data
  - Processor continues with other job
  - Buffer is emptied to storage device
  - When buffer empty
  - signal sent to processor (interrupt)...
  - requesting further data to be sent to buffer
  - dependent on priority
  - Processor interrupts present job to refill buffer
  - Mention of double buffering
- (1 per -, max 6) [6]
- 8 (a)(i) Software that has been specially written to solve a specific problem
- (ii) Software that is immediately available/used by many in similar circumstances. [2]
- (b)(i) Advs:
- Transferable skills
  - Immediately available
  - Shared development costs
  - Fully tested/bugs have been ironed out
  - Compatible with other software
  - Training courses/well trained staff/help groups available
- (1 per -, max 3)
- Dis:
- May not contain all the routines wanted/may contain too many routines [4]
- (ii) -A one off problem...
- means that off the shelf software does not exist
  - Will require specific routines
  - Can be tailored to existing hardware
- (1 per -, max 2) [2]
- 9 (a) -OMR reader
- Disk drive for storage
  - (e.g. Screen, keyboard...) to provide user interface
  - Data read off OMR sheets by light reflection
  - Position of marks corresponds to replies
  - Data stored on hard drive until...
  - batch of data ready for input
- (1 per -, max 2 for hardware, max 4) [4]
- (b) -No prose answers
- Answers in form of tick boxes/underlining/...
  - with limited choice of responses to each question
  - Probably restricted to one sheet
  - Need to keep sheet unfolded/clean
  - Text on form is invisible to the reader
- (1 per -, max 3) [3]

<b>Page 5</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
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- 10 (a)** -Data may be untrue  
 -Some information is confidential in nature  
 -Data may be misused if not protected  
 -Customers may lose financially  
 -Customers may not be willing to supply data  
 -Business may lose potential customers  
 (1 per -, max 2) **[2]**
- (b)** -The right to see data held/to ensure that it is correct  
 -Relevance of information/so that it is not possible to store just anything  
 -Timeliness of information/to ensure that out of date information is destroyed  
 -Limit to personnel able to view/to ensure audience is limited/password protection (only once)  
 -Can not be passed on to others/to maintain confidentiality/secure the system (passwords, only once)  
 -Collected legally/should only be collected and processed for stated reasons  
 (Any three lines, 2 per line, max 6) **[6]**
- 11** -Parallel running  
 -old system is available if new fails to function properly/staff training can be carried out  
 -Phased introduction  
 -Only one file is affected at a time  
 -Big bang  
 -only one system is running / no confusion for staff  
 (1 per -, max 3 pairs, max 6) **[6]**
- 12 (a)(i)** One bit at a time  
**(ii)** More than one bit at a time  
**(iii)** In only one direction  
**(iv)** In both directions, but only one at a time **[4]**
- (b)** -Computer must be able to send data to printer  
 -Printer must be able to send interrupt to processor requesting more data  
 -This happens when there is no data in the buffer/data is not being sent.  
 (1 per -, max 2) **[2]**

**TOTAL [90]**