

# UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Diploma Advanced Level

## MARK SCHEME for the June 2005 question paper

### 5216 DIPLOMA IN COMPUTING

5216 Computing, maximum raw mark 90

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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.

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**JUNE 2005**

CAMBRIDGE INTERNATIONAL DIPLOMA

Advanced Level

MARK SCHEME

MAXIMUM MARK: 90

SYLLABUS/COMPONENT: 5216

COMPUTING

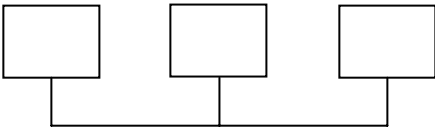
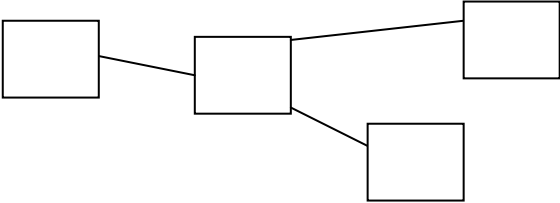
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- 1 (a)(i) Program that can be:
- used in many different situations/to do something useful/task which would need to be done if no computer available/accept a generic example. **Max [1]**
- (ii) • Program which runs/controls the computer/hardware/Provides 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]**

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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
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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) Advantages:  
-Files can be accessed from any machine  
-Data can be shared  
-Software can be shared  
-Peripherals can be shared  
-Communication across network  
Disadvantages:  
-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 advantages, max 1 disadvantage, max 4) [4]

Page 4	Mark Scheme	Syllabus
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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) Advantages:
- 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)
- Disadvantages:
- 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]

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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]**