

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
GCE Ordinary Level

**MARK SCHEME for the October/November 2009 question paper
for the guidance of teachers**

7010 COMPUTER STUDIES

7010/01

Paper 1, maximum raw mark 100

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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1 Generally, one mark per valid point. Two examples can gain two marks.

(a) interrupt

signal sent from a device....
 temporary break
 in (CPU normal) execution of instructions
 to allow it to handle request from a device/peripheral/program
 caused by external event
 can be hardware or software generated
 e.g. printer out of paper, <BREAK> key pressed, error in program

[2]

(b) icon

picture/small symbol/graphic on the screen
 used as a short cut to click on/launch an application
 window *reduced in size* for later use (toolbar)

[2]

(c) ROM

read only memory
 can be read from/can't write to/can't change
 non-volatile memory/keeps contents on switching off
 used to store systems software
 e.g. bios

[2]

(d) buffer

temporary
 ... memory/storage (area)
 to compensate for speed difference of device and CPU
 used in transfer of data between computer and components
 allows CPU to carry out other functions while printing (etc.)
 e.g. printer buffer, keyboard buffer

[2]

(e) validation

check on data input into the computer
 ... to find out if it is incomplete/unreasonable/sensible
 check carried out by the computer
 e.g. range check, length check, presence check, check digit

[2]

2 Any **two** from:
 nearer to English
 portable
easier to modify/change/understand
easier to debug
 no need to understand how the machine works
 problem oriented

[2]

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3 (a) Any **two** problems and associated protections:

<u>problem</u>	<u>protection</u>
viruses	use anti-virus (software)
undesirable sites	put block on certain sites/keywords
over-use of computer	limit access to computer facilities
hacking	firewall, anti-hacking software, passwords
social networking	use of filters/supervision

[4]

(b) (i) any **one** from:

description of password use
(hierarchy of) user ids / log ins
use of dongle

(ii) any **one** from:

CD or DVD writer/drive
(flash) memory stick
external/portable hard disk drive

[2]

4 Any **two** ways (1st mark for method, 2nd mark for how it is used):

take photo/image with a (traditional) camera
..... scan in the photo/image

take photo/image with a digital camera
.... download/transfer photo/image to file

use an existing photo/image
.... scan/download in the photo/image

[4]

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5 For **each** named method give 1 mark for advantage and 1 mark for disadvantage

- DIRECT**
- adv**
- immediate benefits/less time wasted
 - lower costs (only one salaries bill)
 - less likely to malfunction since fully tested
- disadv**
- disastrous if it breaks down
- PARALLEL**
- adv**
- if new system fails, have the old system to fall back on
 - possible to gradually train the staff
 - can compare both systems when running together
- disadv**
- more expensive system (duplication of effort)
 - more time consuming (2 systems operating)
- PILOT**
- adv**
- if new system fails, have the old system to fall back on
 - possible to gradually train the staff
- disadv**
- more expensive system (duplication of effort)
 - more time consuming (2 systems operating)
- PHASED**
- adv**
- if system fails, only a small part of the business affected
 - no need for 2 sets of wages/salaries
 - can ensure stage adopted works before expanding
- disadv**
- very slow as each stage needs to be proved first

[4]

6 One mark for example and one mark for reason e.g.

VoIP type of telephone/Internet telephone

- uses broadband therefore low cost system (or free if to another computer)

online banking (and other service) facilities

- fewer staff required, therefore savings passed on to customer

- saves money not travelling to the bank

online shopping/buying tickets/travel agents

- no need for staffing (etc.) therefore reduced costs to customers

emails

- save on postage costs (etc.)

teleworking

- saves money on transport (not having to go to the office)

[4]

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7 (a) Any **three** reasons from:

travel disruption due to terrorism/increased airport security
 improved work – life balance for staff using video conferencing
 large cost savings in travelling (e.g. some companies have reported savings of up to £30 million per year)
 time savings because no travel required
 broadband networks now replacing much slower dial up networks
 no longer large time delays in transmission – so more realistic
 increasing number of multi-national companies
 urgent meetings can be held at short notice

[3]

(b) Any **one** software item and any **two** hardware items from:

codec (engine that compresses video and audio signals)
 communications software
 synchronisation software

speakers
 microphones
 telecommunication network/broadband connections
 webcams/video cameras/digital cameras (NOT just camera)
 display screens

[3]

(c) Any **two** from:

emails (+ attachments)
 chat lines/instant messaging/online forums
 VoIP telephones and video systems
 social networking

[2]

8 (a) Any **two** from:

count people at the check-outs
 allows optimum number of check-outs to be open
 run computer model with differing scenarios

[2]

(b) (i) infra-red sensor

[1]

(ii) any **two** from:

safety reasons (in case of fire, for example)
 how many check-outs to open
 check on how many customers use s/market at different times
 feed information into simulation/model

[2]

(c) (i) any **one** from:

touch screen/pad
 trackerball

[1]

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(ii) any **one** from:

special offers/goods on sale
map of supermarket/where things are
prices of goods
services available (e.g. insurance)

[1]

(iii) any **one** from:

quick to update
more information can be made available
could allow interaction with customers

[1]

9 2
4
1

[3]

10 (a) Any **two** from:

can view at any time
can view as often as you like
can print out layouts of rooms
interactive system
no need to visit house / view more houses in less time

[2]

(b) Any **two** from:

take photos with a digital camera
photos taken from a single point
camera rotated around the room
images are "stitched" together using software
movies re-sized and configured for Internet use

[2]

(c) Any **two** from:

broadband Internet connections
large memories in modern computers
compression software
digital cameras
faster processors

[2]

(d) Any **one** from:

hot spots/navigational tool – user clicks and walks through a door into another room
integration – integrates plans or maps

[1]

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(e) Any **one** from: e.g.

inside chemical plants
inside nuclear plants/reactors
hotels
games
training
interactive mapping
museums

[1]

11 (a) (E4) (=) $B4 * 3 + C4$
($B4*3 + C4*1 + D4*0$ also correct)

[1]

(b) (H4) (=) $F4 - G4$

[1]

(c) Any **two** from:

validation checks - no negative numbers
 - whole numbers only
 - no letters/type check
 - range check

check if sum of numbers in column G = sum of numbers in column F
check if the sum of the numbers in column H = 0

[2]

(d) E8, H8, E10, H10
 ← 1 mark → ← 1 mark →
 columns E and H (1 mark only)

[2]

12 (a) Any **one** from:

infra-red sensors (to detect movement)
ADC (in case sensors are analogue)

[1]

(b) Any **one** from:

need analogue signal to operate camera motors to move lens/camera
computer output is digital

[1]

(c) Any **one** from:

movement detected
computer compares new image with last image
images are stored and played back later

[1]

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(d) Any **two** from:

no film processing to be done/doesn't run out of film/cost of buying film
instantaneous checks
camera won't need manual emptying

[2]

(e) (i) $400/0.4 = 1000$ images
alternative answer $400/0.0004 = 1\,000\,000$ images approx
(1 048 576 exactly)

[1]

(ii) store images on another hard drive or on DVD/CDs
archive old images

[1]

13 (a) 8

[1]

(b) 1112, 1115

[1]

(c) (special edition = "Y") OR (number of tracks > 10)

< --- 1 mark --- >

< --- 1 mark --- >

(number of tracks > 10) OR (special edition = "Y")

< --- 1 mark --- >

< --- 1 mark --- >

[2]

(d) 1114, 1118, 1116, 1117, 1111, 1112, 1115, 1113

[1]

(e) (i) Any **one** from:

(auto capture) on the database itself
transaction file
spreadsheet

[1]

(ii) link through the reference number/CD title/primary key

[1]

14 Any **four** points from:

get information from experts
input data into knowledge base
create rules base
create inference engine
create human-machine interface/question and answer sessions
firstly test system with "known" problems and solutions
create output system screen/format
create/design validation routines

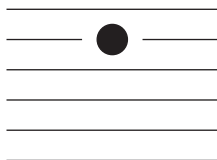
[4]

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15 (a) TAB: 0 1 1 1 0 1

FRET: 0 1 0 0 1 0

(b) (i)



[1]

(ii) 19

[1]

(c) Any **two** from:

can store music directly onto digital, optical media/mp3 players
 easy to modify music by simply changing binary values
 easy to teach somebody how to play an instrument
 easy to convert music for other instruments
 allows auto play back through interfaces
 uses less memory

[2]

16 (a) Any **two** from:

eliminates ticket fraud
 can't get lost (in the post)/sent to wrong address
 easier to amend flight details (no tickets to re-print)
 reduces booking expenses
 faster processing
 can check-in from anywhere (therefore saving queuing time at airport)

[2]

(b) Any **two** from:

computer crashes (therefore "disappearing reservation" – in such cases, paper tickets are better)
 e-tickets not "portable" between airlines whereas paper tickets are
 human confidence – prefer to have "proof" of booking with paper ticket

[2]

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(c) Any **two** from e.g.

destination airport
 starting airport
 name(s) of passenger(s)
 passport number/nationality
 special requirements
 number of passengers
 dates/times of flights
 cost of tickets
 full flight itinerary
 special offers
 information about the airlines
 information about flight facilities
 sort on cheapest/fastest routes/flights
 ability to check availability of flights/search for flights
 terms and conditions

[2]

17 (a) 100 (km/hr)

[1]

(b) **Marking points**

Initialisation (slowest = 1000 or an equivalent high value)
 Correct loops structure and control
 Input (in correct place)
 Calculation of final speed using given formula in part (a) inside the loop
 Output the final speed for ALL cars inside the loop
 Calculation highest speed input
 Calculation slowest speed input
 Calculate the average (two parts to this calculation)
 Final outputs (correct place + some form of processing done)

[6]

Sample program:

```

total = 0                                }
highest = 0                              } 1 mark
slowest = 1000                            }
for n = 1 to 500                          } 1 mark
    input time                              } 1 mark
    finalspped = 200/time                   } 1 mark
    print finalspped                         } 1 mark
    total = total + finalspped
    if finalspped > highest                    }
        then highest = finalspped             } 1 mark
    if finalspped < slowest                    }
        then slowest = finalspped             } 1 mark
next n
average = total/500                       } 1 mark
print average, highest, slowest             } 1 mark

```