

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

0420 COMPUTER STUDIES

0420/01

Paper 1, maximum raw mark 100

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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 got 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]

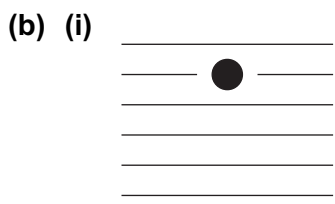
(ii) link through the reference number/CD title/primary key [1]

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



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

```

} 1 mark
}
}
} 1 mark
} 1 mark
} 1 mark
} 1 mark
}
} 1 mark
}
} 1 mark
} 1 mark
} 1 mark
} 1 mark