

**MARK SCHEME for the October/November 2006 question paper**

**7010 COMPUTER STUDIES**

**7010/01** Paper 1, maximum raw mark 100

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 instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began.

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.

The grade thresholds for various grades are published in the report on the examination for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses.

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- 1 (a) **Verification**  
any **two** points from:  
check on input for errors  
on screen checking/checked by human  
comparing input/use of second operator/by double entry  
**examples:** password entry, email entry [2]
- (b) **Video conferencing**  
any **two** from:  
meeting between two or more participants (at different sites)  
using computer network/WAN/Internet  
to transmit/receive audio and video data  
each participant has a video camera/webcam/microphone/speaker  
images appear in real time (on a window on the participant's monitor) [2]
- (c) **Handshaking**  
any **two** from:  
exchange of signals/protocols  
to establish communication/readiness (to send and receive)  
between two devices/computers  
**examples:** printer and computer, modem and computer [2]
- (d) **Simulation**  
any **two** from:  
studying the behaviour of a system  
by using a model/represents real life/mathematical representation  
results can be predicted  
**examples:** flight simulator, hazardous applications, training [2]
- (e) **Batch processing**  
any **two** points from:  
processing does not start until all data collected  
reference to JCL  
no need for user interaction  
output is not time sensitive  
**examples:** payroll system, electricity/gas/water (etc.) billing, cheque processing [2]

2 (1 mark per device and 1 mark per application)  
e.g.

<u>device</u>	<u>application</u>
use of bar code readers	stock control, libraries
use of mark sense readers/ OMR	marking multiple-choice papers, reading questionnaires
use of touch screens	choosing goods online
use of sensors	control applications (e.g. power stations, traffic lights, chemical reactions, counting people)
cameras	traffic control/speeding, security
MICR	cheques
microphones	games, telephone system, security
magnetic strip reader	reading credit/debit cards etc.

(need two different devices and applications)  
(accept keyboards if application is appropriate)

[4]

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

Illegal/unauthorised copying of software/data / software piracy  
sending viruses  
hacking into systems/access illegally  
fraud/improper transfer of funds  
(industrial) sabotage/malicious damage  
altering information illegally

[2]

(b) Any **two** from:

data encryption  
use of passwords/ids/PIN/biometric software  
physical locks  
use of anti-virus software  
log users/computer use/timed access  
anti-hacking software  
use call back facility for in-coming information  
take/check references of potential staff  
firewall

[2]

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4 Any **three** effects from:

loss of jobs  
 traditional shops/banks close  
 city/town centres become deserted as shops/banks close  
 gap between rich and poor grows (rich get access to savings by shopping online)  
 less interaction between people  
 increase in small businesses  
 less pollution/less need to travel  
 security fears  
 people will need credit cards/bank accounts/computer systems

[3]

5 Any **two** from:

animation  
 editing e.g. changing colours on film  
 tweening  
 synchronising voice output with “cartoon” characters  
 addition of text e.g. subtitles  
 special effects e.g. morphing

[2]

6 Any **four** from:

design data collection forms  
 design input forms  
 design system flowcharts/pseudocode  
 design output forms/reports  
 design/select validation rules  
 design/select verification methods  
 design testing strategy/plan  
 specify/select hardware  
 specify/select software  
 design the algorithms/program flowcharts  
 specify the data structure  
 design files (structure)/tables

[4]

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

answers questions asked by the system  
 possible answers supplied as.....  
 .....rule base is looked up  
 .....knowledge base is searched  
 .....by inference engine  
 e.g. minerals/map of mineral deposits/% probability of finding mineral

[3]

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

chess  
 medical diagnosis  
 car/fault diagnostics  
 criminology/forensic science  
 careers  
 tax/financial calculations  
 weather forecasting

[1]

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

work can be done anywhere (at offices in different countries)  
 quicker transfer of files to other offices  
 employ fewer staff (\*\*)  
 less chance of paper/file loss  
 less paperwork (therefore less storage requirement)  
 can open up files from any computer terminal linked to system  
 easier/quicker to search for/sort a given file  
 easier/quicker to cross reference files  
 easier/quicker to insert/reference sections of files into reports

[2]

(b) Any **two** from:

training/need for new skills  
 possible unemployment(\*\*)  
 possible working from home  
 deskilling  
 health effects

[2]

(\*\*) only allow this answer in (a) OR (b) not both

(c) (i) Always have a fall-back system in case of failure/problems  
 results from new system can be checked against known results  
 errors corrected before final implementation

[1]

(ii) Control systems  
 e.g. control of power station  
 control of chemical plant  
 traffic lights

[1]

- 9 (a) error 1: product = 0 on line 2  
should use product = 1
- error 2: loop control, count <= 10 on line 3  
should use count < 10 or alternatively alter count value on line 1 to count = 1
- error 3: print value of product inside loop on line 7  
output should come after the endwhile statement
- [3]

- (b) Accept either of the following loop controls:

repeat		for count = 1 to 10
	OR	
until count = 10		next count
(accept repeat		
until count ≥ 11		

if line 1 changed to count = 1)

[1]

- 10 LEFT 6                    }  
DOWN 5                    } 1 mark  
CLOSE                     }
- UP 5                        }  
RIGHT 4                    }
- DOWN 4                    }  
OPEN                       }

[3]

- 11 (a) (column) A  
or Name

[1]

- (b) e.g. = AVERAGE(C2:F2) or =(C2+D2+E2+F2)/4 or =SUM(C2:F2)/4
- [1]

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(c) Highlight all data (1) Choose column E to sort (1)

OR

Click on any cell in column E(1)  
select sort descending/Z to A button(1)

[2]

(d) PASS

[1]

(e) Range check OR description

[1]

(f) Any **one** from:

graphs/charts

[1]

12 (a) Any **two** input devices from:

touch screens/light pens  
roller/tracker ball/mouse/joystick  
microphone  
touch pads (containing options shown on keys)

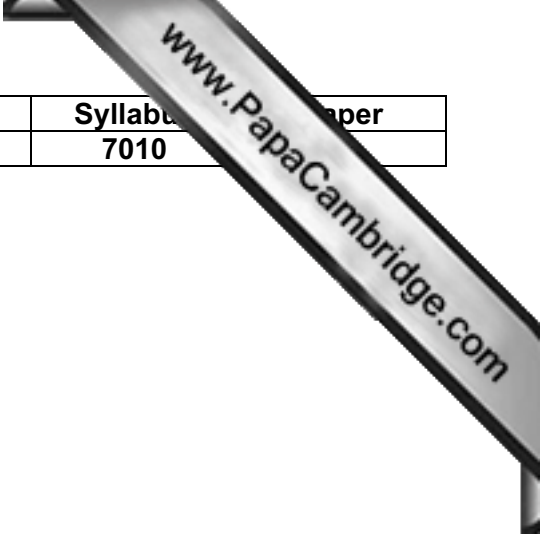
[2]

(b) Any **two** examples from:

maps/directions  
prices of goods/shop products  
flight details  
bank statements/bills  
travel offers  
news updates  
emails/messages

[2]

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(c) Any **one** advantage from:

- airport can advertise services/products
- 24/7 service
- airport can get revenue from other advertisers
- airport can give security information/warnings
- less staff needed for information desks
- quicker response to customer enquiries

Any **one** disadvantage from:

- (cost of) maintenance
- central computer might crash/over-reliance
- hacking
- viruses

[2]

13 (a) Any **two** points from:

- 3D visual world
- created by a computer
- computer simulation
- uses special input/output devices to interact

[2]

(b) Any **two** examples from:

- (data) gloves
- (data) goggles/headsets
- special suits fitted with sensor
- hardware/motors to provide physical movement

[2]

(c) Any **two** advantages from:

- safer (e.g. view inside a nuclear reactor)
- can try out a dangerous task beforehand
- feeling of "being there"
- can perform "actual" tasks without any risk
- ability to store a whole plant on computer disks
- cheaper (if qualified)

[2]



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(d) Any **one** example from:

medical field  
training/teaching  
investigating problems in nuclear/chemical plants  
3D/arcade games  
simulators e.g. flight  
walk throughs e.g. virtual tour of house

[1]

14 Any **three** benefits from:

split into small, more manageable tasks/modules  
easier to debug/test  
easier to modify/update  
leads to a structured approach  
many programmers can be used/different programmers per module

[3]

15 (a) Any **two** advantages from:

portable  
can be used anywhere in school to link to wireless network  
can be used as a standalone computer away from school

[2]

(b) Any **two** disadvantages from e.g.

usually more expensive to purchase/repair  
difficult to use laptop keyboard/in-built mouse  
laptops need re-charging from time to time  
laptops more likely to be stolen/damaged

[2]

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16 (a) (i) Any **one** use from:

recording sales  
keeping accounts  
keeping registers  
use as a mark book

(ii) Any **one** use from:

keeping client details  
storing course details  
keeping book lists

(iii) Any **one** use from:

designing/producing flyers  
designing/producing leaflets  
designing/producing presentations  
designing/producing materials for websites  
application forms

(iv) Any **one** use from:

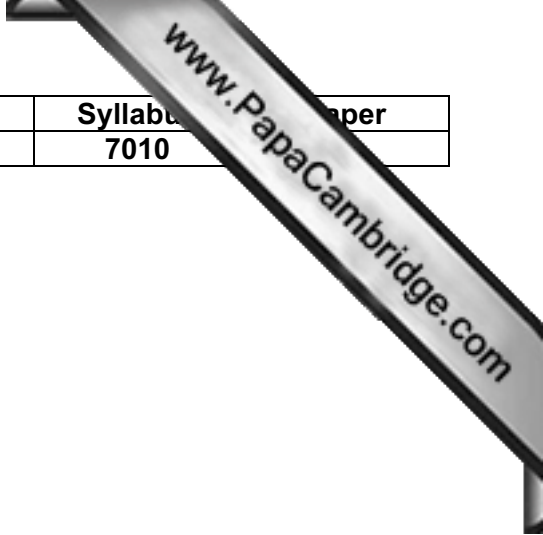
website design  
multimedia material  
training material  
remedial lessons  
interactive material  
(creates hypertext/hypermedia documentation)

[4]

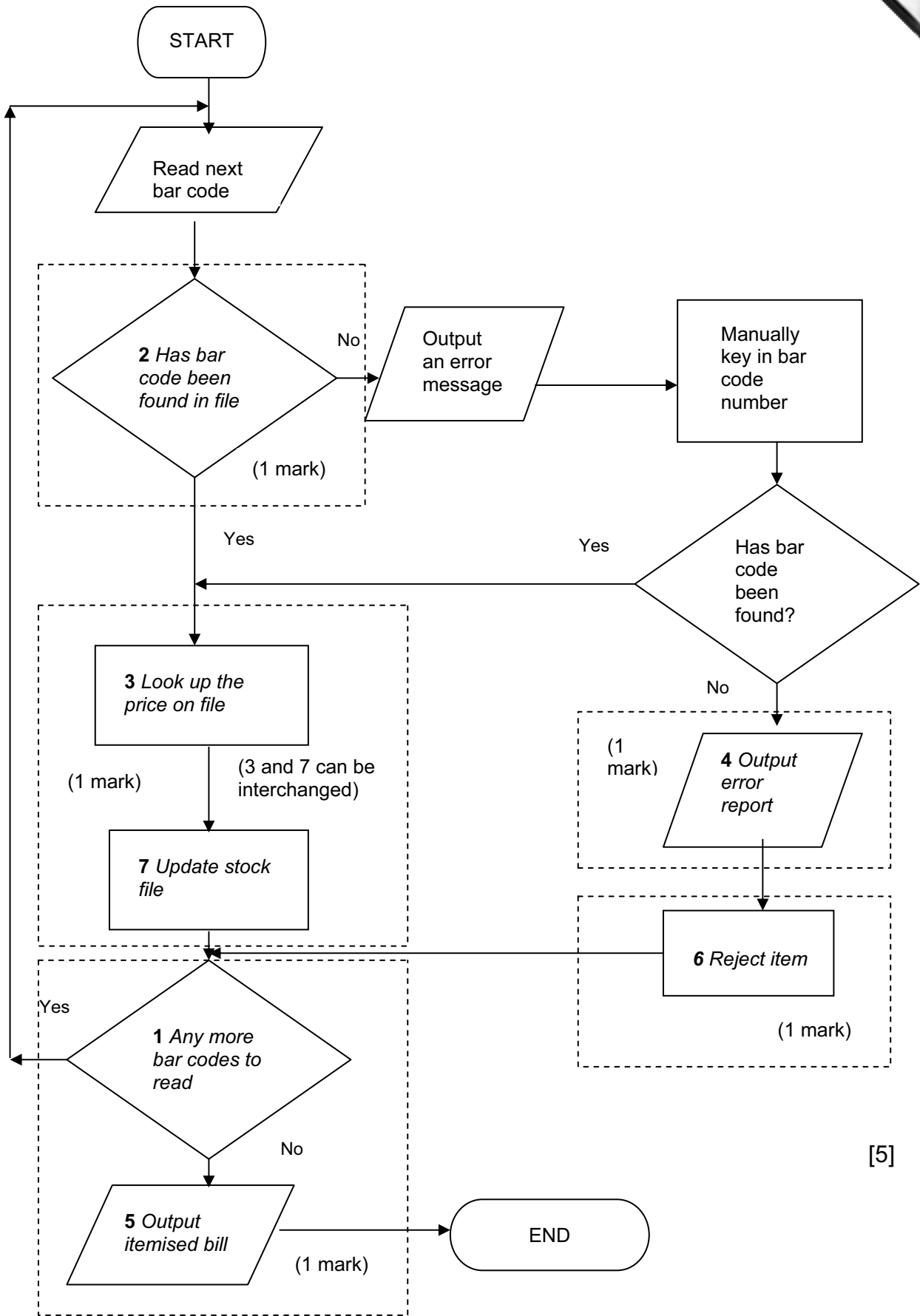
(b) Any **two** features from:

reduce font size  
reduce side margins/top-bottom margins  
use smaller font size/remove any bold text  
reduce size of any pictures/graphs  
reduce line spacing  
use a larger page size / fit/scale to paper size  
edit text

[2]



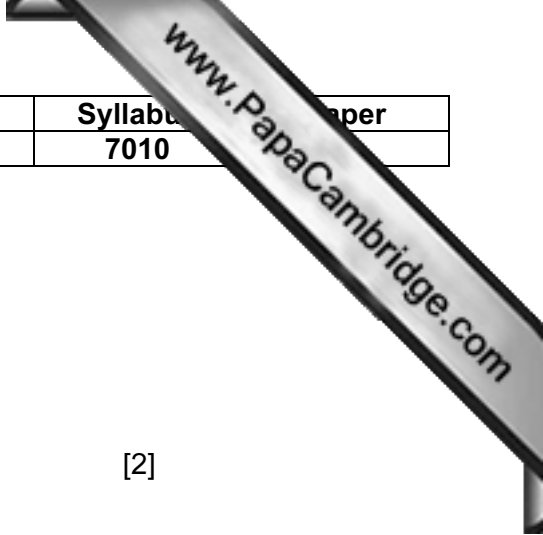
17 Award marks as shown



[5]

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- 18 (a) (i) Reg No
- (ii) unique identifier  
used to search the database  
used to link to other tables of data (foreign data) [2]
- (b) WS 46 ART  
NK 55 ARM [2]
- (c) Either (Engine (cc) > 1400) OR (Doors < 5)  
Or (Doors < 5) OR (Engine (cc) > 1400)  
<---- 1 mark ----><----- 1 mark -----> [2]
- (d) Any **one** from:  
customer code  
customer ref no  
(NOT customer name) [1]
- 19 (a) Any **one** from:  
pressure  
infrared [1]
- (b) Any **one** from:  
sensor signal is analogue  
computers can only understand digital [1]



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(c) Any **three** points from:

number of cars in both directions are totalled  
 computer compares this total .....  
 ..... with values stored in memory/simulation results  
 changes lights/takes action if necessary  
 if no data received, default timing is used

[3]

(d) Any **one** point from:

all lights change to red/amber  
 lights flash  
 automatic timing sequence

[1]

**20 Sample program:**

```

count = 0
total1 = 0
total2 = 0
lowest = 1000
while count < 200 do
  input temp
  if temp < 10 then total1 = total1+1
  if temp > 20 then total2 = total2+1
  if temp < lowest then lowest = temp
count = count + 1
endwhile
output total1, total2, lowest

```

1 mark  
 1 mark  
 1 mark  
 1 mark  
 1 mark  
 1 mark  
 1 mark

(max of 5 marks)

**Marking points:**

Initialisation (but lowest must be set to a suitable value)  
 Correct loop to read in 200 temperatures  
 Correct input for temperatures  
 Check if temperature is less than 10 and increment total1  
 Check if temperature greater than 20 and increment total2  
 Identifying the lowest temperature  
 Output results (only give output mark if some data processing has been done, and outside loop)

[5]

