

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
**International General Certificate of Secondary Education**

## **MARK SCHEME FOR the November 2002 question papers**

### **0420 COMPUTER STUDIES**

**0420/01**      Paper 1, maximum raw mark 100

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UNIVERSITY of CAMBRIDGE  
Local Examinations Syndicate

**CAMBRIDGE**  
INTERNATIONAL EXAMINATIONS

**November 2002**

**INTERNATIONAL GCSE**

**MARK SCHEME**

**MAXIMUM MARK : 100**

**SYLLABUS/COMPONENT : 0420/01**

**COMPUTER STUDIES**



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1 Generally, one mark for each valid point. Two examples gain two marks.

**(a) data logging**

automatic collection of data  
no need for someone to be present  
over a period of time  
reference to sensors  
e.g. at remote weather stations

[2]

entering data = 0, storing data = 0

**(b) check digit**

validation check  
number at the end of a string of numbers  
to check the numbers have been correctly input  
e.g. account number, barcode., ISBN

[2]

by doing some arithmetic=0  
modulo 11 check = 0

**(c) serial access**

accessing data in sequence/one after another  
reading previous data/program to get to one required  
e.g. on magnetic tape, bubble memory

[2]

sequential file = 0

**(d) assembler**

program/software  
converts/changes/translates/transforms  
assembly/low level language to machine code

[2]

**(e) handshaking**

exchange of signals/protocols  
between devices  
to establish readiness to receive data

[2]

communication=0

2 Any three from e.g.

processed fairly and lawfully  
data must be relevant  
data must only be used for stated purpose  
kept no longer than needed  
kept secure/use of passwords/use encryption  
not transferred to other countries without permission  
must register  
subject is entitled to see data  
data must be accurate  
data must be up to date

[3]

punishments = 0, hackers =0, backups =0

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- 3 (a) **Two sensors from**  
temperature  
humidity  
weight/pressure  
light  
proximity sensor  
vibration  
water level  
powder level  
speed [2]
- mercury tilt sensor = 0
- (b) **Two points from**  
data from sensors compared  
with stored value/range of values  
if outside range action taken  
if within range no action taken [2]
- A to D converter = 0
- 4 (a) **Any two ways from eg.**  
Password / PIN / security codes  
digital signature/certificate  
retina verification  
firewall  
anti virus software  
encryption  
dial-back modems  
limit number of attempts to logon  
disconnect from network if hacking is suspected [2]
- user id = 0, restricting access = 0, heavy penalties = 0, hacking laws = 0  
use anti-hacking software = 0, use of fingerprints = 0
- (b) **Any two from**  
patterns are used for identification / unique  
prints are input using light sensing method  
computer (system) stores patterns / prints  
computer (system) stores prints from the scene of crime  
suspects prints are matched by computer [2]

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- 5 (a) Any **two** tasks from e.g.  
 spray paint  
 assembling / welding body parts  
 inspecting car bodies  
 fitting windscreens/seats/engine  
 leak testing / sniffing  
 lifting car parts  
 fitting electric loom  
 pick and place [2]
- (b) Any **two** from  
 moves in tracks/along coloured line  
 builds map in memory / pre-programmed  
 records distance travelled and angle turned to enable return journey  
 emits infra red beam / light sensor / proximity sensor  
 example of appropriate reaction [2]
- uses sensor = 0, pressure/sound sensor = 0
- (c) Any **two** from  
 loss of job/retrenchment                      less money due to fewer hours = 0  
 de-skilling/new skills  
 retraining  
 cleaner/safer environment [2]
- 6 (a) Award **one** mark per point  
store data temporarily  
 compensate for difference in speeds  
 allows CPU to get on with other tasks  
 autonomous peripherals [2]
- (b) Any **one** from e.g.  
 reduces the number of data transfers  
 more efficient use of the processor  
 larger files can be transferred/store more data [1]
- (c) Any **two** points from e.g.  
 stop data being transferred  
 when processor discovers errors  
 when printer cannot accept transfer/buffer is full/paper out [2]
- printer sends an interrupt/signal to the processor = 0

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- 7 Any **three** ways from e.g.
- crop
  - scale/resize
  - flip
  - change colours
  - stretch
  - shear
  - colours/pattern
  - layering/ordering
  - rotate
  - add text
  - multiple copies
  - 3-D
  - merging images
  - changing resolution
  - animation [3]
- imported into WP, DTP, screen saver = 0
- 8 (a) (i) 3½ Floppy A: (or any part thereof)
- C: [1]
  - D: [1]
- (ii) project/classwork/games/homework [1]
- (b) Any **two** from e.g.
- writes tracks and sectors
  - sets up root directory
  - put index/title on disk
  - deletes data [2]
- (c) Any **three** from e.g.
- file management/store document
  - load/run programs
  - output control/print document
  - memory management
  - security
  - allows user to interface/handles interrupts
  - error reporting
  - utility tasks e.g, copy/load/save/sort/merge/defragmenting/delete
  - automatic restart/shutdown
  - multi-tasking
  - multi-programming
  - allocates resources
  - accounting
  - plug and play [3]
- scan for viruses = 0
- bootup = 0
- scandisk = 0

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- 9 (a) Any **three** tasks from e.g.  
 Decide on: software  
 hardware  
**Design:** **input formats**  
 output formats  
 file structures/tables  
 test plan  
 flowcharts/algorithms  
 processing [3]  
 feasibility study = 0
- (b) Any **two** stages from e.g.  
 coding/programming  
 setting up the system/files  
 conversion/transfer of data/files to new system  
 testing  
 installing hardware/data  
 producing documentation  
 training  
 handing over/commissioning/putting system into action [2]  
 methods of implementation = 0
- (c) Any **two** items from e.g.  
 description of what the system is designed to do/how system works  
 minimum hardware and software needed  
 how to load and run the system  
 error messages  
 how to operate each part of the system  
 sources of help  
 troubleshooting/FAQs  
 sample runs [2]
- 10 (a) PRICE (\$) or CODE [1]
- (b) **One** mark per named/described check.  
 length check/number of characters  
 range on number of days  
 range on number of months  
 presence  
 format/picture  
 type check [2]
- (c) M018 [1]
- (d) (DELIVERY DATE > 30/09/02 AND DELIVERY DATE < 01/11/02)  
 /  
 (DELIVERY DATE between 30/09/02 AND 01/11/02)  
**AND**  
 (PRICE(\$)>50)  
 [1 mark per line in above statement] [3]  
 use of wildcards not allowed

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- 11 (a) Award **one** per item  
appropriate heading  
all five fields  
clearly not a handwritten form  
sufficient spaces for data  
link to another screen [4]
- (b) Any **two** benefits from e.g.  
learn at own pace  
learn in their own time [2]
- immediate feedback = 0  
saves time = 0  
reduces cost = 0
- (c) Any **two** points from e.g.  
no need to set aside rooms for exams  
fewer teaching staff needed to mark papers/automatic marking/  
staff can do other things/more accurate marking  
fewer office staff for data entry  
fewer errors/more accurate data entry  
less paper work/lower printing costs  
easier to modify questions [2]
- immediate feedback = 0
- 12 (a) A2:A5  
B2:B5 [2]
- (b) (F2 = ) AVG(B2:D2) or AVERAGE(B2:D2) or SUM(B2:D2)/3 or E2/3 or  
(B2+C2+D2)/3 [2]
- =F2 is 0
- (c) E3 and F3  
E6 and C6  
(ignore F6) [2]
- 13 Award one mark for each correct output
- (a) 13, -8 [2]
- (b) Award **one** mark for each modification
- loop which works  
using sensible rogue value  
correct positioning of input  
calculation of the total inside the loop  
correct output max 4 [4]
- exact copy of algorithm in question = 0



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- 14 (a) **One mark per point**  
**modem**  
converts digital signal to analogue signal/analogue to digital  
so signals/data can be sent down the telephone line/cables (max: 2)  
**ISP**  
provides a connection to the Internet/host web pages  
provides security/filtering (max: 1) [3]
- (b) Any **two** ways from e.g.  
registering  
On-screen input form/questionnaire  
e-mail  
counter to count visitors to site  
ASP/Java script [2]
- 15 Any **four** points from e.g.  
computer asks questions  
features/facts/names of plant are input  
knowledge base searched / look for match  
uses rules / inference engine  
computer suggests type of plant  
knowledge base contains knowledge of experts [4]
- 16 (a) Any **two** from e.g.  
virus  
sabotage by hacker  
spamming/too many users logging on to the system  
electricity failure  
hardware fault  
missing system file  
any natural disaster needs to have its effect described [2]
- bugs/errors = 0 computer crash = 0, data corruption = 0
- (b) Any **two ways** from e.g.  
firewall  
**UPS/backup generator**  
mirrored systems/backup computer system  
anti-virus software  
limit the number of connections [2]
- backup = 0  
passwords = 0  
regular saving = 0

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- 17 (a) Any **one** from e.g.  
push button  
induction loop  
pressure pad [1]  
  
camera/motion sensor/light sensor/sound sensor = 0
- (b) Any **one** way from e.g.  
beeping/green man [1]  
traffic lights/robot
- (c) Must be description. Any **one** way from e.g.  
timing  
**counting** [1]  
testing conditions
- 18 (a) **customer orders** (order entry)  
  
**validation process** **invalid orders**  
  
**update process** **stock/order file**  
  
**invoices** **order/stock file**  
  
1 mark per correct line in flow chart [4]
- 19 Award **one** mark for each correct step in the algorithm  
Input 3 numbers  
Compare first and second, swap if needed  
Compare second and third, swap if needed  
Repeat comparisons  
  
**Use of temporary store**  
  
**Output the numbers**  
  
Max 4 [4]