CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME FOR the November 2002 question papers

0420 COMPUTER STUDIES

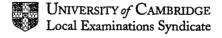0420/01   Paper 1, maximum raw mark 100

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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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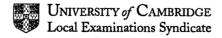
CAMBRIDGE

INTERNATIONAL EXAMINATIONS

November 2002

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK : 100

SYLLABUS/COMPONENT : 0420/01

COMPUTER STUDIES

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

(a) *data logging*
<u>automatic collection</u> 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 <u>correctly input</u>
e. g. account number, barcode., ISBN   [2]

by doing some arithmetic=0
modulo 11 check = 0

(c) *serial access*
accessing data <u>in sequence/one after another</u>
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

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]

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

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:
                      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

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)**   <u>PRICE ($)</u> 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

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

14 **(a)** **One** mark per point
<u>modem</u>
converts digital signal to analogue signal/analogue to digital
so signals/data can be sent down the <u>telephone line/cables</u>   (max: 2)
<u>ISP</u>
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
<u>sabotage by hacker</u>
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

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
traffic lights/robot   [1]

     (c)   Must be description. Any **one** way from e.g.
timing
counting
testing conditions   [1]

18   **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]