

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

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

- 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: [1]
 D: [1]
 (ii) project/classwork/games/homework
- (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) 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

- 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 [3]
 provides security/filtering (max: 1)
- (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

- 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
 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]