

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

These mark schemes are published as an aid to teachers and students, to indicate the requirements of the examination. They show the basis on which Examiners were initially instructed to award marks. They do not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

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*.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the October/November 2002 question papers for most IGCSE, GCE Advanced Subsidiary (AS) and GCE Advanced (A) Level syllabuses.



UNIVERSITY of CAMBRIDGE
Local Examinations Syndicate

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

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

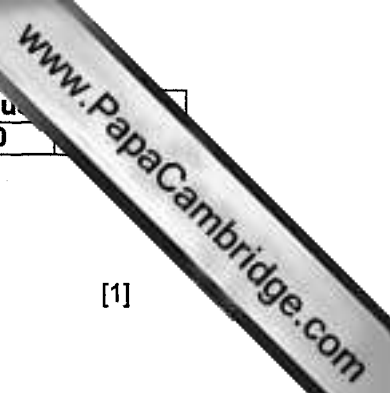
- 7 Any **three** ways from e.g.
 crop
 scale/resize
 flip
 change colours
 stretch
 shear
 colours/pattern
 layering/ordering
 rotate
 add text
 multiple copies
 3-D
 merging images
 changing resolution
 animation [3]
- imported into WP, DTP, screen saver = 0
- 8 (a) (i) 3½ Floppy A: (or any part thereof)
 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

Page 6 of 8	Mark Scheme	Syllabus
	IGCSE Examinations - November 2002	0420

- 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 [1]
 testing conditions

18 (a) **customer orders** (order entry) [4]
validation process **invalid orders**
update process **stock/order file**
invoices **order/stock file**
 1 mark per correct line in flow chart

19 Award **one** mark for each correct step in the algorithm [4]
 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