UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2008 question paper

0420 COMPUTER STUDIES

0420/01   Paper 1, maximum raw mark 100

This mark scheme is published as an aid to teachers and candidates, 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.

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

CIE is publishing the mark schemes for the October/November 2008 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

1   Generally, one mark per valid point. Two examples can gain two marks.

(a) mouse
pointing device/controls cursor
input device
allows user to select options from a menu
used in windows environment
uses buttons/scroll wheels(s)/touch pad   [2]

(b) search engine
used on the Internet
to locate web sites/web pages/other links
based on input of certain key phrases/words   [2]

(c) buffer
temporary memory/storage area
compensates for speed differences of device and CPU
for data being transferred/downloaded between components of a computer system
allows other functions to take place at same time

examples
printer
keyboard   [2]

(d) RAM
random access memory
memory that can be read from and written to
temporary storage/volatile/memory lost on switching off computer
holds user work/programs/data   [2]

(e) download
transfer/copy a file/data/program
from a central computer/host computer/server
to a smaller computer/remote station/user's computer   [2]

2   Any **two** from:
<u>development time is faster</u>
<u>easier to debug</u>
<u>easier to modify/update/understand/edit</u>
leads to a structured approach
can use several programmers to work on individual modules at the same time
complex/large problem/task is broken down into simpler/smaller tasks   [2]

3   marks: 1 mark for correct for/to loop
             1 mark for BOTH input and output in the correct place
             1 mark for finding out how many negative numbers input

    e.g. **for** x = 1 **to** 100

            input n

                    if n < 0 **then** neg = neg + 1

        next x

        print neg   [3]

4   Any **two** from:
    viruses
    hacking then changing/deleting data (NOT just hacking)
    surges in electricity supply
    loss of electricity supply/power
    fault in computer/storage device/storage media
    incorrect shutdown of computer system
    fault occurs during transmission of data

    Any **two matching above named ways:**
    antivirus software
    use of passwords (and ids)/firewall
    anti-surge power supply unit
    UPS
    back up data regularly
    back up data regularly
    retransmission   [4]

5   Any **two** from:
    actual musical notes now generated by software
    digital sampling
    software can autocorrect notes/rhythm
    can play back a section straight after written (notes appear on screen)
    don't need to understand music notation to write a score
    instruments play back through electronic effects machines
    mixers/samplers are computer controlled
    use of electronic/digital synthesisers
    electronic keyboards can now simulate any instrument
    music notes automatically printed out in correct format   [2]

6   **(a)** Any **one** from:
        no need to individually price goods/can change prices easily
        shop assistants at tills don't need to know prices
        less chance of fraud (can't change price by simply altering price tag)
        fewer staff because of unmanned checkouts   [1]

(b) Any **one** from:
produces an itemised bill
permits unmanned checkouts/use of hand held devices whilst shopping (giving a shorter
queuing time)
less chance of errors in final bill   [1]

(c) Any **three** points from:
bar code read/scanned/entered by POS
item code identified
subtracts 1 from number of that item in stock (stock file)
when number in stock < minimum stock level …….
…… system **automatically** re-orders new stock
when new stock arrives, number of item in stock is increased
printouts of stock levels produced for manager   [3]

7 (a) Any **one** from:
fewer cashiers needed/less money on wages
fewer branches needed/less money on rates or rent
less actual cash handling/fewer chances of robbery
can attract more customers (from home and abroad)
can offer full banking facilities (may not be possible at smaller branches)   [1]

(b) Any **one** from:
can lose customers due to lack of personal touch
initial outlay on computers/software can be expensive
greater risk of fraud/hacking and therefore loss of money
need to set up call centres (can be expensive)   [1]

(c) Any **two** from:
no time wasted travelling to the bank
easier/faster to manage accounts
no money spent on travelling expenses going to bank
no embarrassment asking for loans face to face with a manager
possible to still bank even when banks closed/can bank 24/7
don't have to wait for post/immediate payments can be made
disabled people don't have to travel to a bank
less chance of being robbed for cash   [2]

(d) Any **two** from:
hackers can intercept data/risk of fraud
no personal touch
customers can easily mis-manage their accounts
increase in phone bills
without broadband, ties up the phone line
increased risk of losing personal data   [2]

8 **(a)** keyed/typed in twice/compared to stored password

(b) **(i)** encrypt the data

(ii) Any **one** from:
read only access
back up the files regularly
generations of files [1]

(c) Any **two** from:
data must be up to date
data can only be read/used for the purpose for which it was collected
data must be accurate
data must be destroyed/deleted when no longer required/don't keep longer than necessary
data user must register what data is used/stored
data must be used/collected fairly and lawfully
data must be held securely
data must be protected from accidental damage
only authorised people can have access to data
fines imposed for data mis-use
data should not be <u>passed on</u> to a 3rd party without owner's permission
person can view data and have it changes/removed if incorrect
safe harbour [2]

9 <u>**ring network**</u>
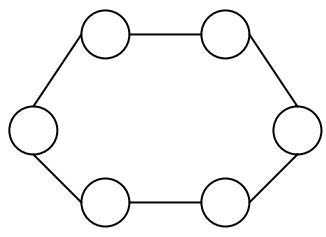
(1 mark)

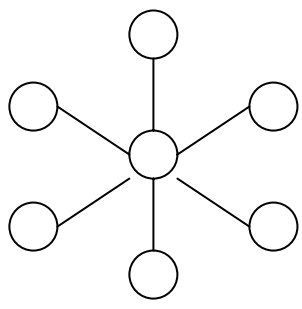<u>**star network**</u>

(1 mark)

Any other **three** points from:
<u>**star:**</u>
shared resources
cable failure isolates/affects only the work station where cable failed
if one station/connection fails the other devices are not affected
if the central hub breaks down, the whole network fails
it is easier to identify faults using this type of topology
it is easy to expand this type of network

ring:
>   shared resources
>   less efficient than star because it needs to travel through all other work stations first to
>   get to destination work station
>   a faulty connection between two stations can cause network failure
>   it is difficult to add a new station/device as it has to come between 2
>   existing stations
>   this type works well during heavy loading
>   it is possible to create large networks using this topology

(NOTE: can get a maximum of 3 marks from advantages/disadvantages if diagrams missing or incorrect) [3]

10 **(a)** Any **two** points from:
>   speed of the traffic
>   information from number plates
>   traffic violation information (e.g. jumped red light)
>   number of vehicles on road/at junctions
>   whether vehicles are stationary/moving/timing of vehicles [2]

(b) Any **two** from:
>   (fibre optic)cables connected to computer
>   radio waves/use of transmitters
>   use of satellite/microwave technology [2]

(c) Any **two** from:
>   can keep traffic moving freely…..
>   ….. since system can control light sequences (i.e. timing) and traffic signs
>   helps to prevent traffic build up/jams
>   can reduce pollution levels (less stationary traffic)
>   can re-route traffic using electronic signs if accident has occurred
>   no need to employ/train human traffic controllers [2]

11 **(a)** Any **two** points from:
>   local service provider receives Mike's outbound message
>   the destination email address is analysed
>   service provider looks (service provider) server that handles inbound messages for
>   destination email address
>   email 'bounced' with error message if not found
>   message is then sent to destination service provider server
>   Asif logs onto his computer
>   message is downloaded when he opens up his in box
>   Asif opens the attached file [2]

(b) Any **two** from:
>   size of file attachment may be too large/take too long to download
>   potential for sending viruses
>   receiver may not have correct software to read attachment
>   ISP could be down [2]

12 (a) (i) 4

(ii) = B3 * C3

(iii) = SUM(D3:D9)   OR

= D3 + D4 + D5 + D6 + D7 + D8 + D9   [1]

(iv) D7, D10   [1]

(b) Any **three** points from:
save the spreadsheets
load images of stock from clipart   } max of
download images of stock from the internet   } 2 marks
scan in images/photographs of the shop/stock   } for input
upload images of shop and stock from a digital camera } of images
load up word processor/DTP software
type in the required text
paste/import/insert picture into document
paste/import/insert spreadsheet (data) into document
insert/paste charts into document
edit the images (e.g. crop, re-size, etc.)
format report (e.g. fonts, layout in columns, etc.)   [3]

13 (a) Any **four** from (order doesn't matter):
definition of the problem
description of existing situation
evaluation of existing solutions
consideration of alternative solutions
feasibility study/report
fact finding/investigation technique….
…..example of technique (questionnaire, interview, document search, observation)
objectives of proposed solution/requirements specification   [4]

(b) Any **two** from:
re-training
loss of jobs/entrenchment
de-skilling
health problems from over-use of computers
becomes easier to search for/organise information rather than doing it manually
no filing to do   [2]

(c) Any **two** from:
wider audience
less expensive than advertising in the press
more information can be made available (e.g. pictures of cars)
can do automatic calculations (e.g. monthly re-payments)
can have a smaller showroom
fewer sales staff needed
can allow on-line test drive booking (etc.)   [2]

14 Any **three** from:
   gather information from experts/carry out questionnaires
   create knowledge base
   put information into the computer
   create knowledge base
   create the rules/rule base
   create/design the inference engine
   create/design the input-output interface
   fully test the system with known diagnostic scenarios   [3]

15 (a) 9   [1]

(b) Earth, Mars, Pluto
   (-1 for each error/addition/omission)   [2]

(c) (**Number of rings** > 0)   OR   (**Diameter (km)** > 50 000)

   < -------- 1 mark -------- >   < ----------- 1 mark ------------- >

                              or

   (**Diameter (km)** > 50 000)   OR   (**Number** of rings > 0)

   < ---------- 1 mark ---------- >   < --------- 1 mark --------- >   [2]

(d) (i) range check
          character/type check

   (ii) character/type check
          length check

   NB check in **(ii)** must be different to check in **(i)**   [2]

(e) Saturn, Jupiter, Uranus, Neptune, Mars, Earth, Pluto, Mercury, Venus

                              (any order)   (any order)

   (1 mark for the correct data – ALL data must be correct for the mark)
   (1 mark for all planets in correct order)   [2]

16 (a) Any **one** point from:
       3D visual world
       created by a computer
       computer simulation

   (b) Any **two** from:
       data gloves
       data goggles/visors
       special suits fitted with sensors   [2]

   (c) Any **two** from:
       3D output of the surroundings
       sound effects
       smells/simulated smells
       movement   [2]

   (d) Any **one** from:
       medical training
       general teaching
       investigating problems in nuclear/chemical plants
       3D games
       design (of chemical plants, nuclear plants, bridges, buildings, etc.)
       virtual tours   [1]

17

[6]
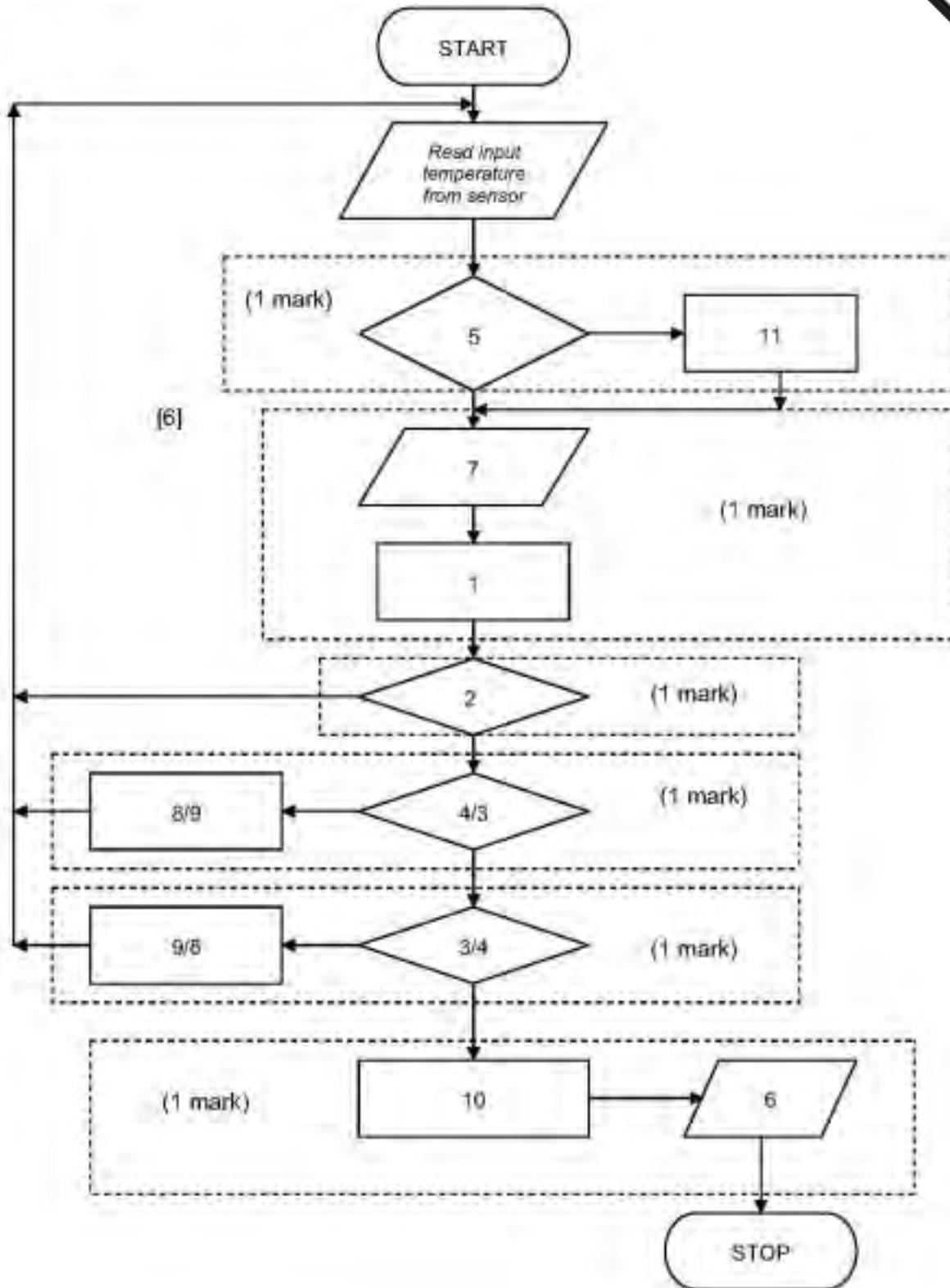
18 **(a)** customer code/borrower number/customer number

(b) Any **three** points from:
computer reads record from book file
compares date due back …….
……. 11th November 2008/this date
if date due back < November 11th ……
……. using borrower number/customer code/customer number
reads corresponding record from borrower/customer file
address is read from the record
mail merge/email automatically sent to customer/borrower
read next file
until end of file [3]

19 <u>Marking points</u>

correct loop
correct inputs
check for type and calculate itemcost
action taken if type NOT 1, 2 or 3
calculate totalcost
calculate the average totalcost
both outputs in the correct place

Sample algorithm:

total cost = 0

for x = 1 **to** 1000   (1 mark)

    input type, partcost   (1 mark)

      if type = 1 **then** itemcost = partcost * 1.5}

      if type = 2 **then** itemcost = partcost * 2.5}   (1 mark)

      if type = 3 **then** itemcost = partcost * 5.0}

      else print error   (1 mark)

    totalcost = totalcost + itemcost   (1 mark)

    print itemcost

next x

average = totalcost/1000   (1 mark)

print average   (1 mark)   [5]