UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

MARK SCHEME for the October/November 2009 question paper

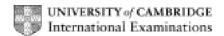# for the guidance of teachers

9713 APPLIED ICT

9713/03   Paper 3 (Written B), maximum raw mark 80

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, which would have considered the acceptability of alternative answers.

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1   (a)   **Any** *three* **points from:**
          files are compressed MP3 file is 1/10th the size of a normal "song" file
          developments in CODECs
          removes high frequency information
          however: higher the bit rate, larger the file, less can be stored but music quality is better
          more compression results in lower quality sound   [3]

    (b)   **Any** *four* **from:**
          possible to download files from **the Internet**
          much **more** material on the Internet
          torrent type of usage more prevalent
          MP3/4 players/flash memory cards are more available/have larger capacities/cheaper hard
          disk storage
          video on demand being promoted by service providers
          Blue ray technology with more information/higher quality
          MP3/I-Pod docking stations have replaced CD players
          combined mobile phone/MP3/movie players   [4]

    (c)   (i)   **Any** *four* **points from (max 3 advantages and 3 disadvantages):**
                <u>advantages</u>
                more programmes available
                not as affected by atmospheric conditions
                high definition sound/picture
                better format for compression
                better quality recordings possible
                more sophisticated programme guide

                <u>disadvantages</u>
                can break up (pixelate) if signal is interrupted
                time lag
                requires special electronic decoders
                hardware can be more expensive   [4]

          (ii) **Any** *two* **points from:**
                use of satellite dishes rather than an aerial
                high speed cable to UBR/service
                LNB to reduce received frequencies
                need for digital receiver/decoders connected to TV   [2]

2 (a) **One mark for each problem (max of 3) and one mark for each solution (max of 3):**
<u>problems</u>
computer fraud
    money taken from **Daniel's** accounts
    stolen **customer** ids
    fraudulent orders placed by hackers
viruses/trojan inserted into web site
hacking into systems
    deleting/amending and distributing personal data
"spyware" on computer system
tracking sites logging customer interests

<u>solution</u>
locked rooms/physical security
firewalls configured to prevent unauthorised access
digital certification for transactions
encryption of customer data transferred
anti-virus software kept up to date
user ids and passwords
anti-pop up software
anti-spyware software
monitoring web traffic
authentication techniques   [6]

  (b) **Any *three* points from:**
use of emails and attachments
use of web forms on his website to answer queries
on line chatting/instant messaging/webcams for a webcast/forum
use of VoIP technology
mail merge email newsletter
Daniel maintains a blog/twitter site   [3]

  (c) **Use of any *four* of the following:**
use of scanners to import images of his products
use of digital cameras to take photographs of his products
web authoring packages to create his web site
DTP/word processors to create text
photo image editing of images for the web site
use thumbnails to link to full sized image/fit a number of images on one page
use of library of designs
use of clip art to save time
photo galleries to save time   [4]

  (d) **One mark for device and one mark for reason:**
dot matrix printer
this uses physical pressure/impact
impact printer goes through several pages   [2]

3 (a) Any *two* points from:
    can work anywhere in the building
    more convenient mode of working
    safer – no trailing wires
    can use away from home – e.g. airports
    less expensive way to set up a LAN [2]

(b) Any *four* points from:
    an increase in RSI risk due to long hours on computer
    vision and posture problems/back ache due to incorrect use of system
    electrocution risk with mains leads
    concerns with long term exposure to wifi
    fire risks due to laptop overheating
    trip hazards due to any cables/bag [4]

4 (a) Any *four (3 maximum for each)* points from:
    Company:
    reduces (booking) expenses:
        no need to print out tickets
        no need for postage
        do not so many offices/staff to issue tickets
    eliminates loss of important documents
    can't be lost, stolen or mislaid

    Customer:
    simplifies and speeds up check-in at airports
    easier to buy tickets and arrange seat
    simpler for passengers – all that is required is a form of id [4]

(b) Any *two* points from:
    security features when ticket issued e.g. customer must provide passport number
    need proof of ID (e.g. passport)
    need to provide customer details when using e-ticket e.g. customer last name [2]

(c) Any *four* points from:
    unemployment for clerical workers
    new employment in technical work
    shorter working times/more flexible working for staff
    less time spent queuing at check-in/buying tickets
    no need to wait for tickets to arrive
    less time spent in the process of checking in
    e-tickets have encouraged more travellers benefiting certain societies/countries
    increases digital divide as customers need Internet access [4]

5 (a) **Any *three* points from:**
    safer than flying the real thing
    can try out manoeuvres without risk
    can try out various scenarios to see how the pilot reacts
    pilot can be automatically assessed
    less expensive to run once set up
    a scenario can be repeated as often as required   [3]

  (b) **Any *six* points from:**
    pilot makes changes to controls
    sensors give feedback to system
    information from sensors is compared to stored data
    computer sends signals to motors to change position etc.
    use of ADC **and** DAC interfaces
    system sounds warning sounds/buzzers
    system updates displays for pilot
    automatically records data during training   [6]

6 **Any *five* points from:**
  system asks questions
  user responds with answers
  future questions are dependent on answers received
  searches the knowledge base to find a match with input
  using the inference engine to match…
  according to rules base
  most likely outcome is given …
  … with % accuracy/probability   [5]

7 **Any *seven* points from (each point needs expansion and reference to scenario, rather than generic responses, to gain the mark)**
  analysis
    research similar systems, establish I/O, look at existing system, observation/questionnaires/ interviews of users/managers
  design
    hardware and software specification for this situation, I/O layouts, establish suitable validation rules, create suitable file structures
  developing
    create data structures, amend structures and program modules in light of testing
  testing
    test each module with normal/live data, test each module with abnormal and extreme data, test system with all modules connected
  implementation
    parallel runs, direct changeover, phased implementation, pilot run
  documentation
    technical documentation (test plans and runs, purpose, listings, flowcharts, etc.) and user documentation (guide to software and hardware that makes up the system)
  evaluation
    evaluate system with regards to efficiency, evaluate system with regards to ease of use, compare to user requirements etc.   [7]

8 (a) **Any** *four* **points from:**
   send out questionnaires/surveys to target groups
   carry out personal interviewing
   carry out telephone surveys
   web sites – ask views and collect information on line
   store all the information on a database …
   … and later analyse the information
   produce a report showing results of surveys [4]

   (b) **Any** *four* **from:**
   previous results of research stored …
   … can cross match results and save time and money
   results from tests on certain drugs stored
   avoids need to repeat expensive tests
   can predict likely outcome of doing certain tests on drugs
   computer can automatically control and monitor mixing of ingredients
   computer model can be used to predict effects of new drug
   storage of analytical results/can check analysis against criteria
   do statistical analysis of results [4]

9 **Any** *seven* **points** *described* **from:**
   webcams to **capture** images
   microphones and loudspeakers to hear others
   large computer screens to **see** captured images
   high speed internet connections/routers for data transmission
   high speed processor to produce good quality images/smoother motion
   compression software to reduce data transmitted
   communications software to establish link between sites/protocol
   sometimes sound/picture quality not good due to delay in signals
   requirement for high bandwidth to avoid video breakup
   time difference can be a problem
   link to server using password and ID
   software to cover security issues (hacking, etc.) [7]