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

UNIVERSITY *of* CAMBRIDGE
International Examinations

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:**
       <u>Company</u>:
       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

       <u>Customer</u>:
       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]