

**MARK SCHEME for the October/November 2011 question paper  
for the guidance of teachers**

**9713 APPLIED ICT**

**9713/32**

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.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

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- 1 (a) Any **three** points from:
- Fewer complaints from customers about queuing times
  - More customers due to faster system
  - Fewer staff required at turnstiles (to admit visitors)
  - Advanced planning possible from trend in purchasing
  - Reduced printing costs as zoo will be printing fewer tickets themselves
  - Zoo will have some advance notice of prospective visitor numbers
  - Customers buying tickets in advance would have to use the website and therefore see any advertising which generates revenue for the zoo
  - Customers buying tickets in advance would have to use the website and will be able to leave feedback for the zoo
  - The zoo can attract more customers by using a website [3]
- (b) Any **three** from:
- (i) Easy to read screen such as suitable font, suitable font size, appropriate background colour, appropriate spacing (at least **two** features)
- Use of multi-choice questions
  - Drop down list with alternative animal features
  - Radio buttons with two possibilities/ or yes no questions
  - Example of question such as 'does the animal have 4 legs'
  - Buttons to either quit or start again [3]
- (ii) The probability of the animal being certain species
- Suggested possible animals species
  - Pictures of possible animals (so user can select correct animal)
  - Sounds of the possible animals (so user can select correct animal)
  - Location on map of animals in zoo
  - Buttons to either quit or start again [2]
- (c) Any **six** points from (max 4 problems or 4 solutions):
- Any 4 problems from:
- Hackers attempting to access files and copy visitor credit card /personal details
  - Unauthorised alterations to web site/customer details
  - Security of data when customer details transferred/stored
  - Uploading of virus to site
  - Uploading of spyware
  - Spammer obtaining zoo's email addresses and sending spam
  - Denial of Service attack
- Any 4 appropriate solutions from:
- Firewall to control access by computers
  - Description of appropriate authentication technique
  - Use of encryption of data when being transferred or stored/use of secure website/https/SSL
  - Use of digital certification to verify website
  - Use of up to date anti-virus application
  - Use of anti-spyware software
  - use of spam filtering software
  - Install a firewall, and configure it to restrict traffic coming into and leaving your computer [6]

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- 2 (a) Any **five** points from:
- Rendering can be altered to view object by polygon rendering, scan line, wire frame, ray tracing/shading effects
  - Zoom used for detail/over view
  - Can view from different angles
  - 3D representation generated from 2D drawings/to view representation of final product
  - Materials required can be stored for use by CAM
  - Costs calculated/stored for analysis
  - Walk through/virtual prototype to show product/product interiors/alternative views
  - Use of library of elements to choose from plus example of elements e.g. windows
  - Accurate dimensions (enabling glass to be ordered before frames built)
  - Designs can be worked on by several designers simultaneously
  - Can be used to create (virtual) prototype to allow changes to dimensions/shape to see effect on e.g. performance
- [5]
- (b) Any **four** of the following:
- Uses critical path method/Gantt/PERT charts finding optimum time to be spent on individual stages/find end date
  - Critical path specifies the order in which tasks must be completed
  - PERT charts specifies the order in which tasks are completed
  - Gantt charts help to show progress of individual tasks
  - Event chain diagrams for visualising multiple events
  - Software helps identify progress made in each task
  - Software helps with daily and weekly planning
  - Identifying progress/lack of progress helps with planning future tasks/Milestones identified such as building walls
  - Some tasks can be done in parallel such as developing software and installing hardware, installing network cabling
  - Other tasks must be done in sequence such as installing hardware, installing software, testing network
  - Number of workers/cost of each stage identified- to monitor cost/organise work force
  - Use of alarms if stage is late and warning zoo director/ project manager
- [4]
- (c) One mark for up to **four** sensor descriptions including use:
- Light sensor to measure lighting level
  - Sound sensor to detect animal in distress/noisy
  - Movement sensor to detect animal awake/ visitor
  - Temperature sensor to ensure animal kept in correct temperature range/ fire detector
  - Humidity sensor (to measure moisture/humidity) to ensure correct moisture levels for animals
  - pH sensor to monitor the water acidity for animals
  - Gas sensor such as CO<sub>2</sub> sensor to ensure (safe) air supply
- [4]

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- 3 (a)** Any **two** points from:  
 Use of multi-choice questions  
 Answered on OMR sheet/ on screen /shade in lozenges/boxes on sheet  
 Candidate types in single word/short phrases  
 Use of barcodes to identify candidates answer paper [2]
- (b)** Any **seven** points from:  
 No fees for examiners/ fewer staff required lowering costs  
 Reduced costs of administration  
 Fewer examiner meetings required therefore cheaper  
 Less likelihood of scripts going missing in transit  
 (Better customer relations due to) faster results service for candidates  
 Increased detailed statistics available  
 Initial hardware setup costs  
 Initial cost of software  
 Errors due to faulty mark readers  
 Errors due to inaccurate completion of OMR sheets  
 Answers not strictly worded as per mark scheme may not be given credit  
 Possible software errors  
 Loss of power can lead to no marking
- Max 5 for all advantages or all disadvantages. [7]
- 4 (a)** Any **four** points from:  
 PC used for office/home tasks v. supercomputer for complex number-crunching/calculations  
 Supercomputer typically used for (large scale) scientific or engineering work/ PC used for office processing  
 PC physically smaller than supercomputer  
 PC less expensive than a supercomputer  
 PCs are suited to generalised computing tasks v. supercomputers often customised  
 PCs usually constructed from cheaper components than a supercomputer  
 A supercomputer can do billions of calculations v. a PC does not  
 Supercomputer carries out more processes per second/ FLOPS  
 A supercomputer is permanently on v. a PC is usually not always on  
 Supercomputer has many more processors than a PC  
 Supercomputer has more RAM/memory compared to a PC  
 Supercomputer uses tailor made/customised operating system  
 Supercomputer can support more users at same time than a PC  
 Security monitoring requires processing power of supercomputer to handle volume of traffic-  
 PC could not cope in the time frame [4]

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- (b) Any **five** points from:
- Complex models created
  - Data provided by sensors such as air pressure, humidity, temperature, rainfall, wind speed
  - Data input into model
  - Calculations carried out/performed
  - Enormous number of calculations carried out
  - Weather reports input
  - Collected around the globe
  - Searches for a match in past conditions
  - Software makes prediction based on past data
  - Software observes patterns in current conditions and makes predictions
  - Selects most likely forecast
  - Creates output charts to screens
  - Uses plotters to print out charts/maps of pressures/wind speeds
  - Human forecaster confirms forecast
- [5]

- 5 (a) Any **four** points from:
- Loudspeakers to generate sound of engines
  - Headphones for communications/hear instructions
  - Motors/hydraulic rams to generate movement/vibrations
  - Screens to project panoramic view
  - LEDs for information on buttons/switches to show status/warnings
  - TFT displays for aircraft status readout/in instrument panels
  - Alarm buzzers when state is dangerous
- [4]

- (b) Any **four** points from:
- Safer method of learning to fly
  - Scenarios can be repeated many times
  - Rare scenarios can be used in training
  - Dangerous scenarios can be simulated with no risk to the pilot
  - Reduces risk of accident causing costs for airline
  - Training costs to the airline can be lower
  - Airline can get printouts or pilot performance
  - Passenger reassurance of quality
  - May be a requirement of Aviation Authority
  - Can be scheduled more flexibly than aircraft
  - Passengers would not like to see a plane with engine failure/ out of public view
- [4]

- (c) Any **four** from
- Supervisor/pilot selects event
  - Software creates the required outputs using DAC
  - outputs to simulate e.g. sharp descent
    - e.g. change in engine note
  - alarm signal/ change in status display
  - Pilots reactions are recorded by system on hard disk for review
  - Pilot inputs data by e.g.
    - pushing on joystick/pedals/pressing control
- [4]

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- 6 (a)** Any **three** points from:  
Wider customer base  
Tickets can be booked at any time/from anywhere - better customer satisfaction  
Reduced number of staff/reduced number of offices/no commission to agents for selling tickets so reduced costs  
Faster processing of bookings/faster check in - better customer satisfaction  
No double booking so better customer satisfaction  
Advanced notice of customer requirements e.g. meals/seat allocations  
Can operate outside normal business hours  
Less risk of losing ticket  
Faster check-in process [3]
- (b)** Any **two** points from:
- (i)** Inspects packets going in and out of system  
Can be hardware or software  
Restricts packets using IP addresses  
Restricts packets using key word list [2]
- (ii)** Issued by a trusted organisation  
allows server and client PC to trust each other/are who they say they are/allows secure transactions  
Used in secure servers/use of https  
Uses public key [2]
- (iii)** Changing confidential data such as customer credit card numbers into meaningless data  
An encryption key is used to encode data  
Key is used to decode data stream  
The longer the key the more secure is the encoding [2]
- (c)** Any **five** from:  
PCs carry out home/office task such as e.g. internet access, office tasks  
PCs usually have smaller backing storage size e.g. smaller hard disks  
PCs usually have slower/fewer processors than file servers  
Fileservers store larger files e.g. databases than PCs  
File servers store user data for access over a network  
File servers reduce the need for users to have local backing storage in their own computer  
File servers control network access rights  
File servers allow access by multiple users/PCs at same time [5]

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- 7 (a) Any **four** points from:
- POS terminal scans item barcode as item sold
  - Barcode checked against field in database
  - Used to lookup stock level
  - Stock levels automatically reduced by number sold in software/database field
  - Stock level compared with re-order level
  - If stock level is equal to or less than reorder level
  - Automatic reorder sent to supplier to request sending of new stock
  - To arrive at a time/date when required for sale/no need to store large numbers of items
  - Item can be sent directly to customer from supplier
  - Item barcode scanned when stock arrives
  - Stock levels automatically increased by software when new stock arrives
- [4]

- (b) Any **four** from:
- Login/logout feature
  - Menu/list of sections of products sold e.g. TVs
  - Hyperlinks to latest offerings
  - Hyperlinks to product details
  - Hyperlinks to details of damage to items
  - Watch list for items buyer interested in
  - Search facility to find a specific music centre/camera etc
  - Bid lists to show latest bids on items
  - Time remaining for bidding facility
  - Buy now facility to avoid having to bid
  - Highest bid facilities to alert of highest bid/new bid
  - Link to secure payment form
  - Currency conversion facilities/show in different currencies
  - Shopping basket with products chosen/checkout facilities
  - Secure payment facilities/storage of credit card or payment details
  - Delivery/order/purchase/order history tracking facilities
  - Contact details for BAC/feedback options
  - FAQs/Help facilities
  - Site map of website
- [4]