## WRITTEN EXAMINATION

## SECTION A

### Question 1

(a) Advice could include to produce books in house so they have control of the whole process, or to outsource where a company which specialises in each part of the process would have economies of scale, which may produce savings. Other advice would include determining the quality of printing and binding they desire, and being clear as to the price they expect manuscripts to sell for.

(b) Compare factors of cost, reliability of delivery, quality of product for each of the stages. Consider whether to use one company for all of the services, or separate companies for each stage. Consider which aspects have existing companies that do this for other organisations (and therefore have economies of scale savings).

Need a process for comparing different companies, requesting quotes, contacting other customers of the companies.

### Question 2

(a) *Income:* Collect the cost to the purchaser of each book ordered and printed, including a unique identifier for each book and the date purchased, and information which identifies the customer. Depending on payment method, collect information on money received. Income to 'Lulu' is 20% of sale.

*Expenditure:* Collect invoices from the external printing/binding and distribution company and the dates payments are made. Record data for each payment of wages to staff including the amount paid and the date paid.

OR data could be collected on own ICT expenses.

(b) Purchases made online could require payment by an electronic method such as credit card. Data entered in the online form could then be transferred automatically to the accounting system for use in the income/expenditure statement.

Lulu could require businesses it deals with (for example outsourced printing/binding companies) to submit electronic invoices that are entered directly into the accounting system and marked when paid by a member of staff for use in the income/expenditure statement. A staff member could enter costs using a keyboard into the accounting system, e.g. a bill for cleaning the Lulu offices.

Database and spreadsheet solutions are also possible, but relatively general-purpose.

*General Comments - Questions 1 and 2*

Many candidates did not mention aspects like
- the reliability/reputation of possible outsource company
- the possibility of using several specialists, such as book binding being a specialist area separate from printing
- reference to small/large print runs
- the cost of software license and server license fees.

**Question 3**

(a) Capture images - digital camera or scanner or device such as mobile phone.

Input text - keyboard (computer or mobile device) or touch screen on a mobile device, or voice recognition.

Upload images and text - to computer using USB or wireless connection, then to Lulu using client's Internet service provider and a browser, or protocol such as webdav, or possibly directly to a Lulu account if using a device such as a mobile phone via an MMS or wireless internet connection.

Create manuscripts - either a browser-based software tool to layout pages with text and images, or a standalone application to do the same. Either could be accessed on a computer or mobile device depending on the interface necessary, but would be difficult to achieve on a small screen.

(b) Lulu would need a website running on a server with software that allows for a secure connection, forms for collecting the data, transactions processing software, database to store the data collected, automated ordering of the binding, printing and distribution by other companies.

Few candidates discussed
- the use of forms for data entry, even though most mentioned web use and databases
- security aspects
- use of digital camera/scanner
- the issue of uploading files.

Nobody mentioned Web 2, or interactive booklet manufacturer software - this would be set up by Lulu and offered to clients either by 'user pays' or 'print your own'.

## Question 4

Intellectual Property - the key question is who owns the intellectual property of a manuscript created using Lulu. Implications include the need for an agreement with the client on signing up for Lulu's services.

Stakeholders include the client, the management of Lulu and the film company.

Depending on the implications the candidate identifies they would then identify possible alternatives for the system to address the implications, and identify any laws that may apply and/or the points of view of the different stakeholders that justify a particular alternative. It is **not** expected that candidates would justify a recommendation.

*Comments*

- Quite a few mentioned 'owning it' but omitted to mention 'intellectual property'. While some did cover 'creative rights', the reality is that when you sell publishing rights, you sell creative rights to the publisher.
- There was generally no distinction between personal copyright and company copyright

## SECTION B

This section was the second most popular, answered by about 48% of candidates, possibly due to the real life examples of the questions asked.

## Question 5

(a) Candidates should address issues such as:
- backwards compatibility of software versions
- differences of software types (different formats of data)
- different operating systems
- capacity (hardware and software) of devices
- maintaining the latest version of files across devices
- maintaining backups
- security issues across devices
- damage and theft
- sensitivity of data (personal information)

This question reflects many real situations – health care, supermarkets and many business applications.

(b) Solutions to the problems could include:
- date stamping of files
- central location of storage of files

- software converters (turning all documents into common formats)
- purchasing handheld devices that are capable of sharing files (Bluetooth, wireless, storage etc.)
- common protocols (compatible operating systems, etc.)
- feedback systems (user input into uploading)
- compatible storage devices
- security enabled PDA's

Many answers could have been given, however candidates needed to address two problems (as asked) in this question. It was hard for markers to see evidence of this in all papers. Markers were looking for real life scenarios.

**Question 6**

(a) An example table could be:

| *Device* | Ring tone | Movie | Photo | PDF | Music | Diaries |
|---|---|---|---|---|---|---|
| **Laptop** | | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Phone** | ✓ | | | | | ✓ |
| **iPod** | | ✓ | ✓ | | ✓ | |
| **Desktop** | | ✓ | ✓ | ✓ | ✓ | ✓ |

The majority of candidates handled this question well, with tables being done clearly. Markers found this question somewhat ambiguous, where candidates read the question literally and there was little scope for a wide range of awards.

(b) Example solutions could have included:

- users decide on data appropriate to be synchronised between devices
- users mark the appropriate cell in the table for the device/data to be synchronised
- users to test that synchronisation is possible with their choices
- users perform actual synchronisation of device/data
- users verify that data has been synchronised.

This question was designed to elicit the higher order thinking skills of candidates. The majority of candidates handled it at a basic level, and higher order answers were rare. This question was an example of where justification of answers was required.

**Question 7** (a) and (b)

Relevant references to the following aspects:

**Hardware**
- **Desktop** – capable of communications and file sharing via LAN or wireless
- **Laptop** – capable of communications and file sharing via LAN or wireless
- **Storage device** – External device to separate data from computer (e.g. NAS, memory card, USB)

**Software**
- **Synchronization software** – enabling uploading of files
- **Anti virus** – security needed for safe synchronization
- **Firewalls** - security needed for safe synchronization
- **Web browser** – to access LiveNet services
- **Conversion/file compatibility software** – required to make sure data is compatible between devices
- **Encryption software** – ensuring sensitive data is protected

**Communications**
- **Network cards/adaptors** – LAN, wireless, Bluetooth
- **Modem** – appropriate to hardware. This may include ADSL/ADSL2 modems with fast broadband connections. Wireless internet modems (e.g. NextG) would be required for remote synchronization.

In this question there were numerous candidates who solely listed the technology. This was the minimum required to successfully answer this question. Candidates who went into further discussion about the technology and the various types of connectivity obtained higher awards.

Some candidates did not discuss all three areas of technology as listed in the question.

Candidates were not expected to list every single component (e.g. mouse) but rather the essential components relevant to communication, storage and file sharing.

Diagrams may have helped candidates in their explanation.

**Question 8**

Example solutions for this question would include responses such as:

- verifying identity before the devices were connected to LiveNET
- identification of stakeholders and discussion from each of their view points
- legal issues including (examples from legislation could have been included):
- Intellectual Property, especially copyright

- privacy
- identity theft
- Responsibility for stored data – which stakeholder does this fall to?
- User agreements that would define legal obligations
- Access to data/third party involvement
- Globalization issues – transborder legislations
- Appropriate content and censorship of data

This question was open ended and directed specifically at Criterion 3.
Candidates were expected to discuss several of these types of issues – many however only listed one. The implications of the issues needed to be discussed for a higher award.

## SECTION C

Candidates did not recognise that this was a database series of questions and instead focussed too much on the hardware. Candidates need to make more connection between new technologies – for example input devices - and their application to real world problems. This section was answered by about 34% of candidates.

### Question 9

(a) Example Fields - Unique Model ID for each model of car (Alphanumeric, Unique), Maker (Text), Model (Text), Date of Manufacture (Date), Model Variant (Text), 3D Shape (3D Model), Front View (lmage), Side View (Image), Fuel Cap Design (Unique Identifier from a list of Fuel Cap Designs), Fuel Type (Unique ID from a list of Fuel Types).

The majority of candidates failed to answer the question fully, leaving out field types and produced minimalist field lists.

(b) A diagram would be useful here to explain key aspects of the layout of a car. Example fields would include which side of the car the cap was on, the height of the cap from the ground, which direction the cap turns in, the type of grip on the cap, the distance from the back of the car (or other points on the car) to the cap, the shape of the flap on the cap, whether the cap needed a key.

Question (b) was handled well with a number of candidates identifying other entries needed.

## Question 10

(a) The camera could capture data that would allow the height and length of the car, the shape of particular components (e.g. windscreen, grill), characters on the numberplate, any badges/model names on the car.

Other devices - an identifying technology (RFID, eTag, barcode on numberplate) required before cars can use this type of service station.

Voice recognition - the driver could respond to questions about the model of the car.

This part was answered well. Full marks were given to candidates who answered both parts of this question well. Some candidates found it difficult to find a practical solution.

(b) Limitations of the camera - it can only capture the image of the car, so would not take into account any modifications (for example a missing grill or a convertible with its roof down). One camera can only take an image from one angle, so may not capture enough images to judge the length of the car, or the shape of the windscreen etc, depending on the angle. The camera requires sufficient lighting, and may struggle if a car has its headlights on. Resolution/focus will determine if fine details can be resolved (e.g. number plate characters or a badge).

Limitations of other device - depends on the particular device.

In general this question was answered well.

## Question 11

(a) Customers would need to indicate they want to refuel. This could be done by driving on a pressure sensitive pad to activate the system, or having customers press a button that is placed where it can be reached from inside the car, out the driver's window. Driving onto the pad or pressing the button would activate the process of refuelling.

There needs to be a system to indicate which pumps are available. This could be achieved by a display screen with a list of the available pumps (using a numbered system) as customers enter the service station.

Each pump needs to be de-activated once it has filled a car, until the customer has paid, and then re-activated once a payment has been made. This can be achieved by having a connection (most likely wired in a service station) to each pump from the payment system. Once a payment is made the system sends a re-activate signal to the pump.

(b) Customers need to be recognised on arrival, know where to drive to, commit to refuelling, refuel then pay.

Recognition - camera to capture data frequently, software to process the images (recognise there is a car there, then particular features) or pressure pads to capture the position of cars in the service station, then other technology to identify each car (camera, or other technology suggested in Q10), software to process data and match with database. Also important to capture identifying data, such as the number plate, to deter customers from driving off without paying.

Knowing where to drive to - could be a speaker attached to a system that has software to speak to drivers ('blue Magna please drive to pump 7'), could be a display screen that indicates which pumps are available.

Commit to refuelling (see above)

Refuel – robot

Pay- EFTPOS system (reachable by driver in car or in central spot) consisting of a touch screen to display cost and allow customers to choose options (eg. credit or savings) and check total before paying, and device to capture card details (most likely a magnetic strip reader with current cards).

Receipt printer. Vending machine style device for taking cash and dispensing change. Connection between system and pumps to allow the amount of petrol to be transferred to system and a signal that payment has been made back to the pump.

Several candidates emphasised the hardware aspects only in their solutions. Those candidates who explained the processes using the equipment and software gained better results.

**Question 12**

Implications include:

- the risk of malfunction of the robotic arm causing damage to a car (and who is responsible legally and/or ethically for the malfunction and any reparation)
- the loss of jobs in the service stations
- the potential for customers to drive off without paying
- the potential loss of customers because of a perceived reduction in the service
- the cost of the arm compared with potential savings from automating the petrol station.

Stakeholders include the customers purchasing the petrol, and the Management of the chain of petrol stations, the inventors/manufacturers of the robot arm.

Depending on the implications the candidate identifies they would then identify possible alternatives for the system to address the implications, identify any laws that may apply

and/or the points of view of the different stakeholders that justify a particular alternative, perhaps evaluate the options.

Most candidates did not give this question enough emphasis or time and effort. Many candidates only identified the cost part of the scenario as the only social implication. A good result was obtained by those candidates who addressed a range of issues.

## SECTION D

This section was answered by about 80% of candidates, reflecting that the question was either perceived to be easier to answer, or better understood, than other questions.

### Question 13

(a) Angel can only manufacture a finite number of lures each day. She will need to choose ahead of time which to manufacture. Lures may be very popular and she cannot manufacture enough to meet demand. She may not produce enough of particular styles of lures. She may run out of the materials required to produce particular lures as orders still come in.

(b) Orders - she could keep an archive of orders so that over time she could build up a pattern of the orders being made. She could record how many of each type sell per week or month and then ensure there are that many in stock. If the dates of the orders are stored it would be possible to do an analysis to see that particular lures sell more at particular times of the year (e.g. a 'woolly bugger' lure in the trout season).

Materials - she could record how many lures are made out of a particular amount of material, and then use this data in combination with an archive of orders to ensure materials are ordered ahead of time. Record when each unit/amount of material is used or arrives to produce an inventory so that, for example, when she gets down to 100 hooks she orders from her hook supplier.

Stock of lures - after each lure is made or an order is sent, record that to keep a list of how many of each lure type are in stock.

### Question 14

(a) Newspaper, radio, TV advertisements (more state/national than international), mail outs, advertising in fishing newsletters, word of mouth.

(b) Internet can be targeted (e.g. particular searches on Google) and immediately national and international.

While there is a cost for Internet ads, TV or newspaper ads are not targeted and would be prohibitively expensive to do nationally for this size of business.

Advertising in fishing newsletters is targeted, and does not require a customer to initiate looking on the Internet (e.g. search for lures in Google). However it could be part of an Internet strategy to find mailing lists or forums etc. to advertise on.

Mail outs - again untargeted and would be prohibitively expensive to do nationally for this size of business.

A website would allow for word of mouth to work better as people could act on the word of mouth wherever they are in the world.

Not many candidates mentioned specific targeting of potential customers. Better candidates suggested fishing magazines including specialist areas such as trout fishing.

Many candidates mentioned TV but should have mentioned cost-benefit. More plausible answers might have included pamphlets to target local communities and international magazines. Interestingly a few candidates proposed employing a person to travel the world as a lures salesperson!

Also better candidates included possible research of existing companies or industry groups to help establish customers' needs.

**Question 15**

(a) Software for creating the website that allows for the production of pages, links, text describing the business, contact details and images is essential. A database is required, with a record for each lure, including an image, description, price, which the website reads to display lists and search results. Transaction processing software to build a list of orders (a diagram would be useful here, or description of the 'shopping basket' analogy).

The website would need to be located somewhere on a server. Angel could use her home Internet connection and computer to run a web server, although she would need to consider the type of connection she has available and the reliability that is guaranteed by the ISP. She may need to upgrade to a business plan.

A better option may be to outsource the running of the server to a company that hosts many websites. In this case Angel would still need an Internet connection to upload files, or make changes online depending on the company's setup.

Another alternative would be to set up the business using a site with all the tools readily available, such as eBay.

She would need a computer, camera (still/video), possibly scanner and/or printer.

(b) There are a number of options from a software point of view - the main distinction being having a third party provide the transaction services (e.g. PayPal or a company that specialises in building e-commerce solutions for small businesses), or running an application on her server that provides a (https) secure connection and a transaction processing system such a 'shopping basket' setup.

Not many mentioned the need for a camera to take digital images for use in any type of publication including the web. The better candidates mentioned this with the need for high resolution images.

Many candidates suggested use of secure payments using well known e-commerce solutions such as eBay or PayPal.

**Question 16**

Establishing identity - data that would need to be collected would be shipping details (name, postal address), payment details (credit card number, or identity via a system such as PayPal, billing address) and contact details (phone numbers, email address).

Implications include reference to the National Privacy Principles (for Angel and potentially a third party e-commerce provider):

- what data Angel needs to collect for the transaction to happen, and not collecting unnecessary data
- the security of the data once it is collected
- who has authority to access the data once it is collected
- customer access to the data to check if it is right
- a privacy policy being available.

Stakeholders include the customers, Angel and potentially the operators of third party transaction processing/e-commerce solutions.
Depending on the implications the candidate identifies they would then balance the considerations for the setup of the e-commerce system.

Responses to this last question were disappointing, with many candidates offering only one or two- line solutions. The question was an opportunity for candidates to demonstrate their knowledge regarding privacy of the individual's identity and personal details. In addition, the responsibility of the company to store such information securely and not communicate it to others should have been mentioned to achieve a higher rating.

Candidates should ideally have clearly separated legal, ethical and social issues.

## MAJOR PROJECT

There was a pleasing variety of projects, mostly being databases and websites, but of widely varying complexity.

The roles that each member of the team had in the group were sometimes not clearly defined, making it hard for the markers to distinguish how much contribution each member had made. More careful proof reading of the final personal and group reports would have been expected to pick up spelling and other grammatical errors.

There were a number of candidates who used external clients; however the majority used the teacher of the subject as the client. Projects may be better if based around an actual client rather than on a provided case study.

### Presentation of Portfolio

It was extremely helpful for the markers if the portfolio had a Contents page, and was separated into sections clearly demonstrating the parts of the individual candidate's work and that of other team members.

A suggested format would be:

- Contents page
- Section One – Individual 'My contribution and work' section, including individual journal of progress throughout the project
- Section Two – Complete project documentation illustrating the full group's work/all documentation – including group journal of progress throughout the project/Gantt charts, etc.
- Members must offer proof of a timeline record keeping. Some examples would be by submitting email correspondence or web-log records.

Loose sheets need to be bound in some way. Better candidates used spiral or plastic binding or similar.

### Identification and Analysis of Problem

It would be desirable that team members identify the other college team members in their group with the TQA ID number, or reference to members A, B, C, … It may be a good idea for each member of the group to include all group member ID's in a header or footer of their documentation.

Many candidates presented this aspect of their portfolios as an inclusive part of their journals. Better candidates had a clear introduction explaining the context of the problem, data sources, etc. before going on to discuss possible solutions.

## Design and Development

Clear documentation showing screen shots was enhanced/clarified if the candidate had provided a copy of their software solutions and documentations either on CD or as web links. Most candidates included digital formats of their work – in a few of these the data could not be read.

It was expected that evidence would be clearly presented about the system which was designed and developed, and that this showed good utilisation of features to meet the identified needs. This would achieve the highest criteria award.

Some examples of key features would be:

- working relationships, queries, reports, formulas, validation rules, user interface
- a cohesive website with working links and design features to meet the client needs.

It may be possible to have a TQA server for uploading websites prior to their due date, so that assessments can be done on this secure location.
The better candidates provided clear and tested user manuals with all application documentation.

## Evaluation

Again many candidates chose to include this aspect of the project within their journals. Along with the evaluations, better candidates included clear test plans accompanied with samples/annotated screen shots showing proof of tests.

The better candidates provided evidence of user manuals being tested and refined.

**All correspondence should be addressed to:**
Tasmanian Qualifications Authority
PO Box 147, Sandy Bay 7006
Ph: (03) 6233 6364 Fax: (03) 6224 0175
Email: reception@tqa.tas.gov.au
Internet: http://www.tqa.tas.gov.au