GCE

Applied ICT

Advanced GCE **AS H515**

Advanced Subsidiary GCE **AS H115/H315**

Mark Schemes for the Units

January 2007

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MARK SCHEMES ON THE UNITS

Mark Scheme G041
January 2007

There are 100 marks available for this test. They are allocated as follows:

- Tasks 2 and 3   30
- Section A of the test paper   50
- Section B of the test paper   20

Task 2

1 mark each for boxes labelled
- Sports Manager
- Receptionist
- Administration Assistant
- Newspaper
- Sponsors
- Teams

plus labelled arrows to show the following information flows (1 mark each) and methods (1 mark each)
Max 15 marks.

Note:
- Arrows should only be awarded points if they are drawn to and from the correct boxes.
- Marks may be awarded for unconventional diagrams provided they isolate the senders and receivers of information.
- Do not award marks for flow diagrams or series of text boxes linked by arrows.
- Marks cannot be awarded for 'How' if the information is not identified/is incorrect but can be awarded if information is essentially correct but vague or incomplete.
- Labels should not be awarded marks if they are contained within the description of a process.
- If lines cross, mark labels as long as it is clear where each arrow goes.
- Marks should only be awarded for labels that can be unambiguously linked to a single arrow.
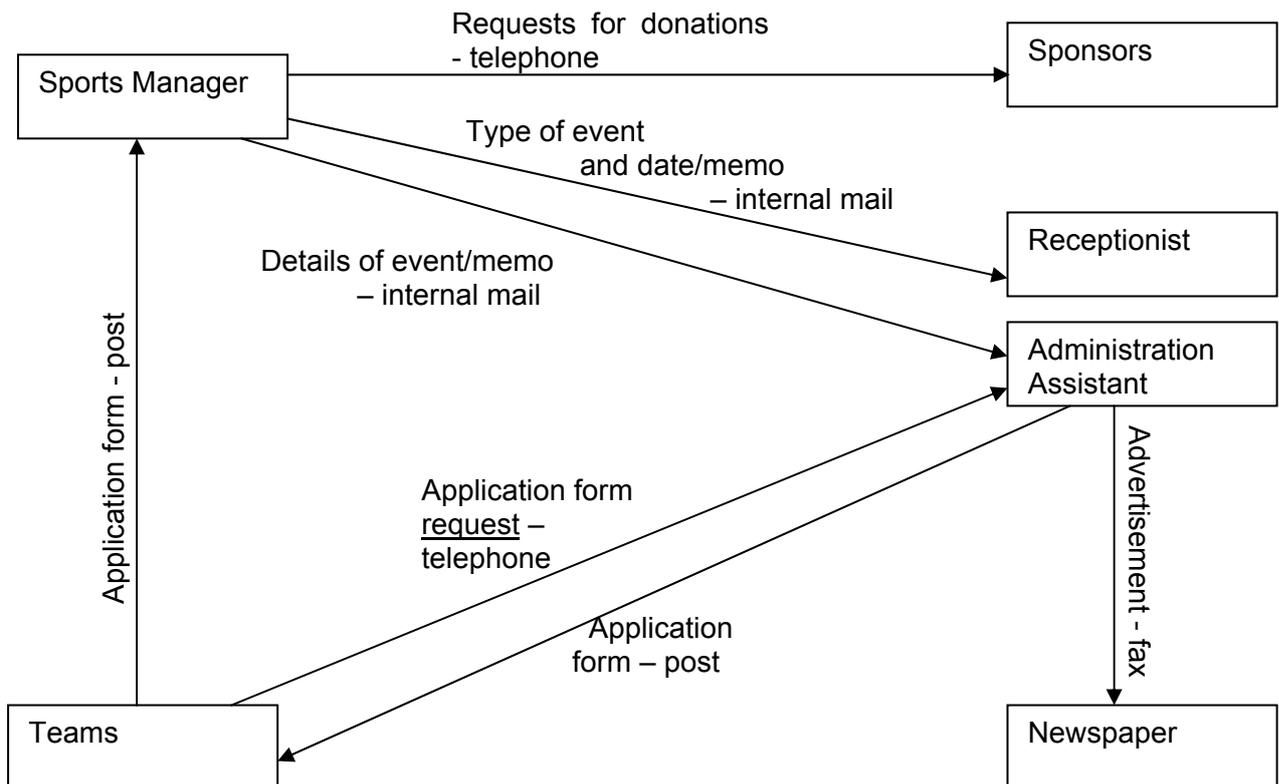
Task 3

The quality of written communication is assessed through this task.

QWC Marks	Guidance
3	Virtually free of errors of grammar punctuation and spelling.
2	A few errors in grammar punctuation and spelling may remain.
1	Errors in grammar punctuation and spelling may be present.

A04 is assessed through this task.

A04 Marks	Guidance
3	A strength and a weakness in the method(s) used identified or suggestions for improving own performance.
2	A strength or weakness in the method(s) used identified.
1	Some comment made on the method(s) used.

Tiered response based on:

Coded	Marks	Guidance
H	7-9	A detailed, clearly and logically expressed explanation of the implications of the DPA applied to the organisation, staff and members of KFSC.
M	4-6	A limited explanation of the implications of the DPA applied to the organisation, staff and members of KFSC.
L	1-3	Clearly expressed basic statements of the requirements of the DPA, not applied to KFSC.

Candidates who simply explain the requirements of the DPA without applying them to KFSC can only be awarded marks from the lowest mark band.

To include consideration of:

- the need to register with the Information Commissioner
    - name and address of identified data controller, eg Centre Director, Membership Manager
    - description of data to be processed, eg names, addresses etc of members
    - description of purpose of processing data, eg to process membership applications
    - details of anyone data will be disclosed to, eg member's bank
    - details of any countries outside EU data may be transferred to, eg none
    - security measures to be taken, eg locked filing cabinets, secure server, access only to those who need it

- compliance with DPA principles
  - collected and processed fairly and lawfully
  - collected and used only for specified and lawful purpose(s)
  - adequate, relevant and not excessive, eg only information needed to identify member and collect payments
  - accurate and up to date, eg data held sent out to member annually for checking and updating
  - kept no longer than necessary, eg data deleted if member leaves
  - processed in accordance with rights of data subjects
  - kept secure
  - not transferred outside EU unless adequate levels of protection
- rights of staff and members
  - access to personal data – needs application in writing plus (usually) payment of fee
  - prevent processing likely to cause damage or distress
  - prevent processing for purpose of direct marketing – applies to members – need for tick box on application form
  - correction, blocking, erasing or destruction of inaccurate data   **[15]**

Annotation:
- CS – response has been applied to case study
- P – identifies points
- E – identifies expansions/explanations
- E+ - good explanation

Section A

1   Any **one** job function and matching tasks from
*   human resources (1) plus **four** of
     -    advertising vacancies
     -    sending out and receiving application forms
     -    arranging interviews
     -    drawing up contracts
     -    keeping staff records
     -    ensuring staff get correct wages and leave entitlement
     -    ensuring pension contributions made and recorded
     -    ensuring compliance with legislation relating to staff – eg DPA or H&S
     -    keeping records of training courses attended and qualifications obtained
     -    arranging for staff to attend training courses
     -    calculating hours worked from signing in book
     -    running payroll system once a month
     one mark per point to max four
*   finance (1) plus **four** of
     -    keeping records of all financial transactions
     -    arranging payment of staff wages (using on-line banking facility)
     -    arranging payment of invoices (using on-line banking facility)
     -    OR 1 mark for arrange payments
     -    producing monthly and annual reports (for owners and Inland Revenue)
     -    generate quarterly VAT returns
     -    posting direct debit mandates to banks
     -    confirming direct debit approval to Membership Manager by email
     -    sending direct debit requests to members' banks
     -    adding income to sales ledger – accept specific examples eg amount
          requested from members' bank account or shop takings
     -    adding payments made to purchase ledger
     one mark per point to max four   **[5]**

2   Any **five** of
*   dealing with requests for membership
*   receives membership forms
*   detaches direct debit mandate and hands to finance
*   enters details into membership database
*   makes up and sends membership cards
*   monitors members' accounts
*   accesses membership and booking records
*   once a month runs report to make up members' accounts
*   sends out monthly accounts and annual renewal letters
*   gives summary list to finance clerk
*   responsible for day-to-day running of reception desk
*   manages team of receptionists
1 mark per point to max of five   **[5]**

3   Any **one** supplier and matching interaction from
        • cleaning company(1) plus **three** of
            - Centre Director negotiated contract initially
            - responsible for renegotiating annually
            - contract details number of cleaning staff needed
            - contract details number of hours cleaning staff needed for
            - contract details price (of services)
          one mark per point to max three
        • maintenance company (regular maintenance) (1) — accept an example, eg pool
          cleaning, plus **three** of
            - contract for regular maintenance
            - Sports Manager negotiated originally
            - renegotiates as necessary
            - contract details maintenance to be carried out
            - contract details how often maintenance will be done
            - contract details monthly or annual cost to KFSC
          one mark per point to max three
        • maintenance company (emergency) (1) plus **three** of
            - Sports Manager telephones company
            - explains nature of problem
            - told when engineer will call
            - engineer gives estimate to Sports Manager
            - Sports Manager agrees estimate and work carried out
            - invoice sent detailing price to be paid
          one mark per point to max three   **[4]**

4   a (weekly) hours worked (1 mark)
        plus an explanation that includes any **five** of
        • book at reception desk
        • staff sign in (book)
        • when they start and finish work
        • HR assistant uses book each Thursday
        • to calculate hours worked in previous week
        • <u>keys in</u> staff number
        • to access personnel record
        • keys in hours worked for week
        1 mark per point to max of five   **[6]**

     b A description that includes any **five** of
        • look up hours worked each week (for hourly paid staff)
        • add weekly figures together (to give hours for month)
        • look up hourly rate from personnel records
        • multiply hours worked by hourly rate (to give gross pay)
        • divide annual salary by 12 (for salaried staff)
        • calculate pension contribution (if applicable)
        • subtract pension contribution
        • calculate NI
        • look up tax code
        • use tax code to calculate tax
        • subtract tax and NI
        • add values to running totals for year
        1 mark per point to max of five   **[5]**

c

Organisation – 1st mark	Information
HM Revenue and Customs (accept Inland Revenue or Tax Office)	Any **one** of: • Tax Code • Tax Ref. No. • NI Category • NI Number.
Staff member's bank	Any **one** of: • Account Number • Sort Code.
Pension Scheme/Company	• Pension contribution/rate

1 mark each for organisations plus 1 mark each for matching information.   **[4]**

5   A description to a maximum of **10** from
    hardware
    - <u>two</u> workstations (1) with barcode readers (1) connected to local area network (1)
    - laser printer (1st) can be accessed from any workstation (1)
    - chip and pin card reader (1) with telephone connection to banking system (1)

    software
    - booking system (1st) created using DBMS (1) with on-screen booking form (1)
    - membership and booking records (1st) can only be accessed by Membership Manager and receptionists (1)

    input data
    - facility or class, date and time (1st) selected from dropdown lists (1)
    - membership number (1st) keyed in (1) or barcode on card scanned (1)
    - booking number / membership number and facility (1st) when member checks in (1)
    - PIN (1st) to authorise card payment (1)

    outputs
    - availability (1st) shown on screen (1)
    - booking code generated (1st) told to member (1)
    - booking / membership details on screen (1)
    - booking confirmation printed (1st) when button clicked (1)
    - <u>card</u> receipt (1)

    processes
    - looks up record for facility for date and time required (1st) to see if available (1)
    - create booking record (1st) when button clicked (1)
    - cost of facility or class (1st) added to member's account (1)

    To achieve maximum marks there must be at least one point from each section.   **[10]**

6   a   Any **one** of
        - chip and pin card readers increase security of payments (1) because customer must know pin/signatures can be forged (1)
        - EPOS terminals linked to server with stock database (1) so items sold can be deducted from stock database <u>automatically</u> (1)
        - barcode readers reduce data entry errors (1) as prices/product codes do not have to be entered manually (1)
        - use of barcodes allow shelf edge pricing (1) which removes need for staff to individually price items (1)
        - any change due is calculated (1) reducing errors (1)
        Up to **two** marks each to max of 2   **[2]**

    b   Any **two** of
        - no link to main system (1) so cannot look up members' details (1)
        - members lose discount if card is forgotten (1) because there is no way of confirming membership (1)
        - details of sales must be re-input into sales ledger (1) which may result in data-entry errors (1)
        - Sales Manager has to check all stock records (1) which is time consuming/which may result in something that is running out being overlooked (1)
        - requirements must be re-entered by administration assistant to create purchase orders (1) increasing the opportunity for errors in the orders (1)
        Up to **two** marks each to max of 4   **[4]**

c   i   Any suitable improvement suggested and explained eg:

- link shop system to main local area network (1) so that sales can be added to sales ledger automatically/membership database can be accessed (1)
- add re-order levels to stock database (1) so purchase orders created automatically when stock falls below re-order level (1)

Up to **two** marks each to max of 2   **[2]**

    ii   A suitable benefit explained that matches the improvement eg:

- finance clerk would not need to enter sales (1) so fewer data entry errors (1)
- membership details can be checked if card forgotten (1) so members don't lose discount (1)
- members could add cost of goods to account (1) so can pay at the end of the month/don't have to carry cash or credit card (security) (1)
- less chance of goods that need to be ordered being missed (1) and shop running out of goods (1)
- less chance of errors in purchase orders (1) due to misreading of hand-written list (1)

Up to **two** marks each to max of 2   **[2]**

    iii   A suitable problem identified that matches the improvement eg:

- there may be differences between the systems (which need to be overcome)
- more network management may be required
- discrepancies in sales may not be picked up
- orders may not respond to sudden changes in demand
- staff may need training to use new features
- additional equipment/software may be required (which costs money)

One mark each to max of 1   **[1]**

Section B

7 a Any **three** of
- staff/personnel number
- position/job role/department
- tax ref/NI number
- hourly rate
- pension scheme status
- emergency/contact details
- date of birth
- sex/gender
- nationality/ethnicity
- CRB check
- joining date
- disciplinary action
- attendance figures/days absent
- courses attended/qualification

or any relevant item pertaining to HR
DNA age
1 mark per point to max of three **[3]**

b An **two** points plus explanation eg:
- record training plans for employees (1) so that skills are kept up to date (1)
- keep record of courses attended and qualifications obtained (1) to see if further training required (1) to ensure all employees get fair share of training (1) to help with decisions about promotion or references for new job (1)
- to note special skills that staff have, eg first aider (1) so that they can be found quickly if particular skills required (1)

2 marks each to max 4 **[4]**

8 a The Internet can be <u>accessed</u> by anyone worldwide (1 mark) an intranet can only be <u>accessed</u> by people who are part of the organisation (1 mark)

OR
The Internet is a global network (1) an intranet is a network within an organisation (1)
[2]

b Any **one** of
- to advertise company (1) by setting up a company website (1)
- to sell goods (1) using e-commerce (1)
- to carry out research (1) to find suppliers etc/check what competitors are doing (1)
- to book travel (1) by accessing airline/train company sites (1)
- communication/feedback from customers (1) using email/discussion groups (1)

Up to **two** marks each to max of 2 **[2]**

c Any **one** of
- to keep staff informed about company (1) by providing access to all information via a browser/standard interface (1)
- to provide access to standard documents (1) through a standard interface/from a single menu (1)
- to provide staff with access locally to only relevant websites (1) by downloading them (1)

Up to **two** marks each to max of 2 **[2]**

9   a   Any **one** of
        • working from home
        • working while travelling
        1 mark   **[1]**

    b   Any **one** positive effect explained eg:
        • increased interaction with family/neighbours (1) if they don't have to travel to
          work (1)
        • may become more motivated (1) because they are not directly supervised/are
          their own boss (1)
        • greater flexibility (1) can fit work around family (1)
        Up to **two** marks each to max 2   **[2]**

    c   Any **two** negative effects explained eg:
        • may become less motivated (1) due to lack of direct supervision (1)
        • risk of job loss (1) due to changes in work skills and number of staff required
          (1)
        • reduced job security (1) due changing contractual arrangements (1)
        • problems may take longer to solve (1) as less opportunity to share experiences
          and discuss ideas (1)
        • employees may feel isolated (1) due to reduced social interaction at work (1)
        Up to **two** marks each to max 4   **[4]**

Mark Scheme G054
January 2007

There are 100 marks available for this test. They are allocated as follows:

- Tasks 2, 3 and 4   30
- Section A of the test paper   50
- Section B of the test paper   20

Task 2 (13 marks)
10 marks available for DFD (See example DFD)
1 mark each for:
- Consistency of symbols (C)
- External entity customer identified (EE)
- Logical order of processes (L)

1 mark for each process with associated flows/data store (P) (MAX 7)

Evaluation – 3 marks available

Mark	
1	Some comment on method(s) used to develop DFD
2	A strength/weakness in method(s) used identified
3	A strength and weakness in method(s) used identified

```
                         ┌──────────────┐        ┌──────────────┐
   ╭──────────╮          │ Details of   │        │ Booking  details
   │ Customer │ ───────▶ │ booking      │ ─────▶ │ entered      into
   ╰──────────╯          │ received     │        │ booking system
                         └──────────────┘        └──────────────┘
```

Customer

Details of booking received

Booking details entered into booking system

Booking system

Invoice & booking ref. given to customer

Booking ref and invoice generated

Invoice

Booking details manually recorded

Booking details

Payment received

Booking details passed to boat yard
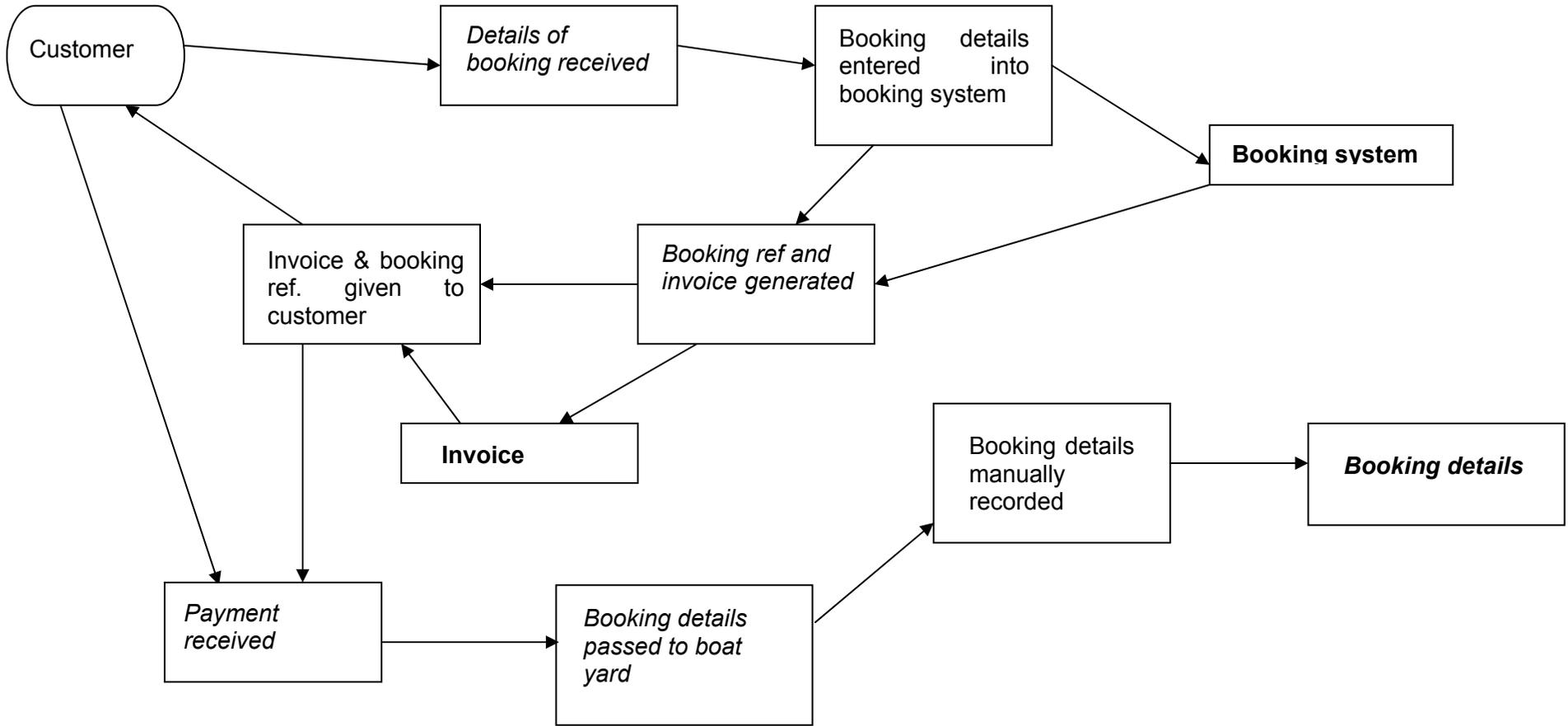
Task 2 January 2007

Data Stores identified in **Bold**

Task 3 (12 marks)

The mark scheme for this task will be issued along with the mark scheme for G054 – June 2007.

Task 4 (5 marks)
1 mark for correct syntax, for example the number of Ifs = number of EndIf.
1 mark for each correct outcome of condition (Max 4)

```
Get Boat Record
        If SC date= 7 days
                Do SC Preparation
        Else
                If last service >= 6 months
                        Do Service
                Else
                        If Painted >= 12 months
                                Do Paint
        Else
                If Maintenance >=10 hire periods
                        Do Routine maintenance
Else
        No Action
        EndIf
        EndIf
      EndIf
EndIf
```

Section A

Question	Answer	Mark
1	**Describe the purpose of the proposed system.** *Any 4 from:* To solve the problems caused by the current system (1) example of problems given (1) To produce reports as defined by owner of CC (1) example of reports given (1) To improve communication (1) between office and boat yard (1) To standardise software used in company (1) to improve sharing of stored information (1) To increase security of data held (1) company accounts/staff records (1)	4
2	**Describe the functional requirements of the proposed system.** *Any 3 from:* To calculate <u>and</u> print invoices (1) To keep a database of customers/ boats/boat records(1) To record payments/keep accounts (1) To produce reports on the status of the narrow boats/bookings for each narrow boat/revenue from each boat (1)	3
3	**Identify two other process constraints that should be considered giving two example of each.** *Any two from* *1 mark for each constraint, up to 2 marks for examples. If constraint wrong then NO marks for examples.* **Constraint** - Hardware Choice (1) **Examples:** The client may request a particular hardware platform (1) In CC the owner has requested a laptop (1) that all peripherals should be upgraded (1) **Constraint** – Software choice (1) **Examples:** The client may request a particular software package (1) In CC the owner has requested that the software be standardised throughout the company (1) no particular software has been requested (1) **Constraint** – Budget (1) **Examples:** The client may set a maximum budget for the development of the new system (1) In CC the budget set is £40,000 (1) for hardware and software (1)	6

4	**Describe two problems caused by the current system at Canal Capers.** *Max 2 per description, any 2 from:* Information must be transferred between sites (1) can be misplaced/misunderstood (1) Information at <u>boat yard</u> is on paper (1) information being lost/misplaced (1) Customer dis-satisfaction (1) as narrow boats are being double-booked (1) Narrow boats being out of service/repaired/maintained /painted/prepared for safety certificates (SC) (1) yet still being booked out to customers (1)	4
5	**User requirements are defined in the Feasibility Stage. Describe two user requirements of Canal Capers.** *Max 3 per description, any two from:* Increased security (1) for keeping staff personnel records (1) company information (1) Improve communication (1) between the 2 sites/internal (1) external communication (1) through the use of email (1) Ability to produce reports (1) examples of reports given (Max 2 for reports) Be able to develop a secure website (1) for customer booking (1) and payments (1) Recording of customer/bookings/boat (1)	6
6	**Identify one other method of investigation suitable for use at Canal Capers, giving two reasons for your choice.** *1 for method, up to 2 for reasons. If method wrong then NO marks for reasons.* Observation (1st mark) used with admin staff/boat yard staff (1) observing someone doing their job is better than asking someone to describe it (1) by observing nothing is forgotten (1) can identify any delays in processing data/information (1) can see working practices (1) Document analysis (1st mark) useful when developing a system to convert manual to computerised (1) to see format/layout (1) to ensure consistency (1) good strategy for obtaining factual information (1) Interviewing (1st mark) questions can be modified as information is given (1) facility for additional information to be identified (1) interviewee feels important (1) creates a rapport with interviewee (1) suitable in CC for use with owner (1)	3

7a	**Discuss the differing approaches that can be used to implement a new system.**			

Band	Mark Range	
H	7 – 9	Four Implementation methods described with advantages *and* disadvantages given.
M	4 – 6	Three Implementation methods described with advantages *or* disadvantages given.
L	1 - 3	Implementation methods identified with a brief description.

Band	Mark Range	
H	3	Virtually free of errors of grammar, punctuation and spelling. All technical words correctly spelt.
M	2	A few errors in grammar, punctuation and spelling may be present. Most technical words correctly spelt.
L	1	Errors in grammar, punctuation and spelling may be present. Some errors in spelling of technical words.

Cost MUST be quantified

Parallel
Description - Old and new systems run together, results compared for consistency, old system stopped when confidence in new system is high.
Disadvantages - End-users doing same tasks twice, very expensive in terms of staff and time costs.
Advantages - Old system can still be used if problem with new system, no detrimental effect on company.

Phased
Description - Selected sections/departments use new system, other parts of business use old system, when confidence in new system high then system implemented in another section/department, until all business using new system.
Disadvantages - Can cause double work load if tasks move departments during processing, may lead to increased work load for staff, can take a long time, very expensive in terms of staff and time costs.
Advantages - Old system can still be used in parts of company if problem with new system, limited detrimental effect on company.

Pilot
Description - Selected tasks performed by new system, rest completed using old system, when confidence in new system high then system implemented for another task, until all tasks using new system.
Disadvantages - Tasks that don't go through new system may be those causing problems in old system, can take a long time, very expensive in terms of staff and time costs.
Advantages - Errors/bugs can be found and rectified before implementation is continued.

Direct/Big Bang
Description - New system completely replaces old system on a given day.
Disadvantages - System failure may mean loss of all data access, needs to be well-planned & new system needs testing fully/completely prior to implementation.
Advantages - Cheap in terms of staff and time.

				12

7b	**Identify the most suitable implementation method for Canal Capers, justifying your choice.**	
	1 mark for method, 2 marks for justification – must relate to method selected. If method is wrong then NO marks for justification.	
	Phased (1st mark) there are 2 sites (1) can implement system in Admin offices (1) ensure that Admin sub-system is correct (1) then move onto Boat Yard (1) where some data/information required is reliant on Admin (1)	
	Parallel (1st mark) run manual and new system in parallel (1) means more work for staff (1) ensures that the new system is running as required (1) and if there are any problems with the new system (1) running of the company will not be affected (1)	3
8	**Explain, with reasons, the training strategy that could be used for the following groups of end-users.** **Max 3 per end-user** *If strategy is wrong then NO marks for reasons.*	
	Owner – on site (1) one to one training (1) requires training on complete system (1) needs to 'fit in' with schedule (1) already computer literate (1) only needs training on the new system (1)	
	Admin Staff – on-site (1) group training (1) using system once installed (1) may need to teach basic computer skills (1) revision of skills for those with some computer skills (1) need training whilst manual system is still running (1) only need training on part of the system applicable to the Admin staff (1) some admin staff may need to go to a training provider (1) learn basic software manipulation skills (1) e-learning (1)	
	Boat Yard Staff – on-site (1) group training (1) only need to train staff who will be using the system (1) need to train only on system used (1) off site training provider (1) may need basic computer skills (1) may need to do training need analysis (1) may be advantage to train 1 member of staff on admin system (1) to ensure total understanding of whole booking system (1) knowledge can then be disseminated to other staff (1)	9

Section B

Question	Answer	Mark
9a	**Identify three components of the software specification part of the physical design specification.** *Any 3 from, 1 mark each:* Outline program specifications System flowchart File organisation Access methods Error messages Screen and report layouts	3
9b	**Identify two components of the output specification part of the physical design specification.** *Any 2 from, 1 mark each:* Data required for output Screen report layouts Methods of data output Printed report layouts	2
10a	**Explain the function of a data dictionary.** *Any 3 from:* A record of data about data (1) entries held about data elements (1) including data elements/structures/flows/stores/processes (1) enables future maintenance/development (1) to see structure of database being used (1)	3
10b	**Identify two components of a data dictionary.** *Any 2 from, 1 mark each* Name Description Aliases Type Format Values Security Editing Comments Relationships Attributes	2

11	**Explain the advantages and disadvantages of using a customised off-the-shelf software package rather than a bespoke software package.**	
	Max 4 for advantages or disadvantages	
	Advantages: Software has already been tested (1) ready to use (1) Readily available (1) quick to get running (1) Upgrades/patches of s/w are readily available (1) may be free (1) Support available (1) Internet/support groups/Discussion Boards (1) Purchase price (1) does not tie up capital (1)	
	Disadvantages: May have large footprint (1) includes features not required by end users (1) May not be able to be fully customised (1) may not fully meet needs of end users (1) May not integrate with current software (1) causes integration problems (1)	5
12	**Explain why it is important to keep referring to the defined end-user requirements during the analysis and design stages of the systems life cycle.**	
	Any 5 from:	
	end-user will define what they want from the new system (1) following investigation the analyst may feel that these are not feasible (1)	
	in consultation with the end-user (1) an alternative requirement list could be developed (1)	
	analyst must check all requirements for inputs/outputs (1) to ensure that the reports are fit for purpose (1)	
	if checking is not done (1) the system may not fulfil the defined requirements of the end-users (1)	
	may not be useful for the company (1) not used (1) waste of money/time (1)	5

**Mark Scheme G055
January 2007**

There are 100 marks available for this assessment. They are allocated as follows:

- Pre-release   30 marks
- Section A of the test paper   50 marks
- Section B of the test paper   20 marks

Pre-release material

Task 2

Network diagram showing a physical star topology

Any **six** of:
A   file server in a secure location
B   print server
C   mail server
D   applications server
E   network printer
F   patch panel
G   hub/switch or wireless access point
H   bridge
I   UPS
J   cabling positioned safely eg not across walkways and connected to hub/switch
K   router.
1 mark each to a maximum of 6   **[6]**

Cable and connectors

1 mark for matching cable and connector
        (eg UTP/RJ-45, STP/RJ-45, Fibre/ST/SC, Wireless/USB or PCMCIA)
        (accept Cat5, Cat5e, 10BaseT, etc for UTP).

1 mark for appropriate cable for Rolling Rocks network
        (eg UTP/RJ-45, Wireless/USB or PCMCIA)
(do **not** accept fibre).

1 mark for description of suitability of cable and connector choice
        (eg covers required distances/UTP, acceptable speed/UTP, no need for wiring/wireless).
                                                                                                                [3]
Connecting Equipment

1 mark for identification of appropriate connecting equipment
        (eg hub/switch – cabled, wireless access point/wireless hub – wireless, router – cabled or
        wireless, network interface card).

1 mark each for description of suitability of connecting equipment from:
- fits star topology (1)
- justification (eg hub/simple, low cost, switch/better security, faster transmission, WAP/no
  need for cabling, router/allows connected machines to access the Internet, NIC/controls
  access to network media) (1).
Max 2 marks
                                                                                                                [3]

Any other additional hardware

Any **two** hardware items from:
- extra PCs – one for each employee
- network printer – no need for server – direct access to print queue for all users
- scanner – to allow easier input of images for brochure
- backup device – data security for file server
- file server machine – central storage of database and other data
- print server machine – dedicated machine for managing print queues, less processing for printing on individual machines
- applications server machine – less copies of software needed
- mail server machine – management of mail traffic
- network interface cards – control access to network media (if not awarded for connecting equipment)
- UPS – allow continuous operation, reduce risk of loss of data due to power fluctuations
- Patch panel – provides a central connection point for cables.

1 mark for each item to max 2 then 1 mark for description of suitability of each item   **[4]**

Any additional software

Any **one** item of additional software/configuration from:
- network operating system – controls operation of entire network
- server operating system – controls operation and communication for server machine
- client operating system – controls operation and communication for client machines
- network drivers – deals with operation of network interface cards
- protocols – (eg NetBEUI, TCP/IP) settings for communication on network
- email software – allows internal communication between users on the network
- FTP software – for uploading
- Browser software – for accessing the WWW
- Anti-virus software – to prevent viruses entering/spreading across the <u>network</u>
- Firewall – prevent unauthorised access to network.

1 mark for item then 1 mark for description of suitability of item   **[2]**

Evaluation

For 1 mark: some comment is made on method(s) used (1)
For 2 marks: a strength <u>or</u> a weakness in the method(s) used is identified (1)
For 3 marks: a strength <u>and</u> a weakness in the method(s) used is identified (1).
Max 3 marks   **[3]**

Task 3

Any **two** of:
- email
- file sharing
- printer sharing
- use any computer in the same way
- intranet.

1 mark for each up to 2 marks   **[2]**

Any **two** of:
- better communication between employees (1) by email/file sharing (1)
- better communication with customers (1) by email/website/e-commerce (1)
- less individual responsibility for data and backing up (1) this can be done centrally by an administrator (1)
- won't have to move to another computer to print (1) can choose from all network printers and print from own machine (1)
- can move around office as all machines are set up the same (1) profile follows user (1)
- better access to up to date information (1) using a single interface (1).

Up to 2 marks each for two justifications   **[4]**

Quality of written communication

For 1 mark: errors in grammar, punctuation and spelling may be present.
For 2 marks: a few errors in grammar, punctuation and spelling may remain.
For 3 marks: is virtually free of errors of grammar, punctuation and spelling.

                                                                                                           [3]

Section A

1   Any **three** of:
- new cabling and connectors
- new machines for servers
- new machines for workstations
- network cards
- network operating systems
- network software
- connection equipment – switch or hub or router
- staff training
- cost of physical installation.

1 mark for each up to max 3   **[3]**

2   Any **two** of:
- can share database (1) making stock enquiries much quicker (1)
- can share resources (1) such as printers (1)
- can use a network to communicate (1) better team working (1)
- can share software (1) all machines can easily have access to the same software (1)
- work can be monitored (1) from a central computer (1)
- security procedures/backup/virus checks (1) can be managed centrally (1)
- software updates (1) done once on server (1).

1 mark for each point to max 2 then 1 mark for expansion of each point   **[4]**

3   Any **two** of:
- each user can have complete control over their own machine
- there will be less need for a network manager
- there will be a maximum of 9 or 10 users so small network
- peer-to-peer is the cheaper option as no server machine is required
- no dependence on central server.

1 mark for each up to max 2   **[2]**

4 **(a)** Any **three** of:
- data travels in one direction/low collision rate
- data passes from one machine to another
- machines each have a receiver and a transmitter
- UTP, STP or fibre optic cable from machine to machine
- monitor station for error checking
- each machine is connected to two other machines.

1 mark for each up to a max of 3 **[3]**

(b) **(i)** 1 mark for a correct diagram
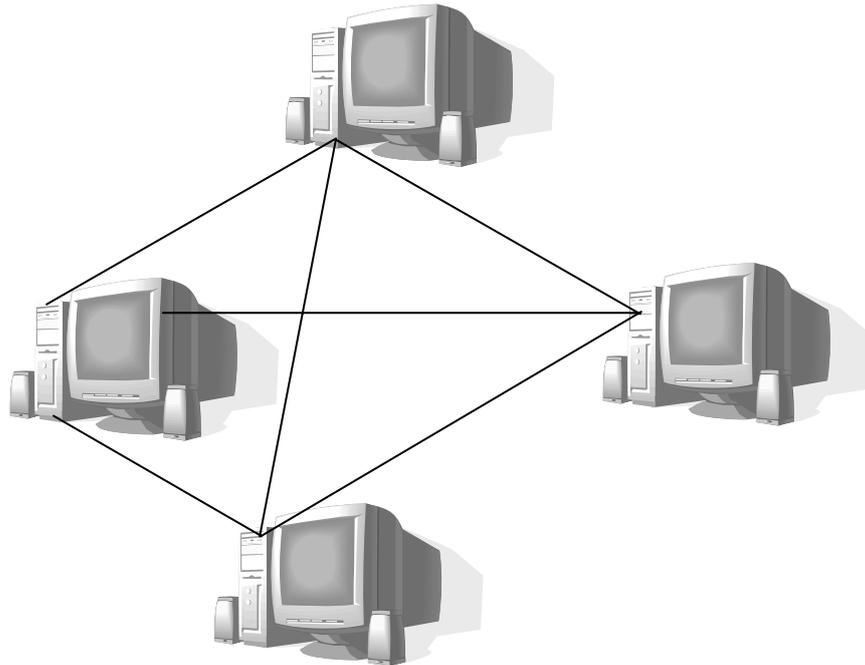
[1]

    (ii)   1 mark for each feature identified:
- concentrators/multiple access units/switches/routers connected to each computer
- UTP/STP/fibre optic cable connecting components
- direct connection between computers
- data passes directly from one machine to another
- data can pass through a number of machines to get to its destination
- data can go by different routes.

    1 mark for each to a maximum of 3 marks   **[3]**

(c)   1 mark for each advantage, disadvantage or statement of suitability. Extra mark for explanation.

Mesh advantages:
- if one machine stops working (1) the rest of the network carries on as normal (1)
- very fast transfer (1) directly from one machine to another (1)
- can cover long distances (1) with right type of cable (1)
- data can be sent by different routes (1) to speed up transfer.

Mesh disadvantages:
- costly and complicated to install (1) because of so many cables (1)
- difficult to install new machines in the network (1) because of so many connections (1).

Suitability:
- fast enough (1) for the data they will transfer (1)
- dependable (1) can rely on the network (1)
- probably too costly (1) speed and reliability don't justify cost (1)
- not easy enough to expand (1) and may need to later (1)

(must have one advantage, one disadvantage and some statement of suitability).

Max 6 marks   **[6]**

5 **(a)** RJ-45 connector. **[1]**
1 mark

(b) Any of:
- 8 copper wires
- wires twisted in 4 pairs
- no earthed shield around wires.
1 mark **[1]**

(c) Any of:
- minimum interference/noise (1) during data transmission (1)
- transmission speeds (1) of up to 100mbps or 1000mbps (1)
- low cost (1) in comparison to fibre optic (1)
- commonly used (1) in Ethernet networks (1).
1 mark for point then 1 mark for expansion of point **[2]**

6 **(a)** Any **two** of:
- used to divide a network into segments
- forwards/filters packets from one segment to another
- uses MAC addresses to decide which segment receiving node is in
- connects LANs using the same protocol
- layer 2/data link layer device
- increase number/reduces size of collision domains.
1 mark for each up to max 2 **[2]**

(b) Any **two** of:
- forward packets to destination node
- makes decisions based on the best path through the network
- keeps a table of all IP addresses and possible routes
- sits between different types of network
- layer 3/network layer device
- uses access control lists to increase security.
1 mark for each up to max 2 **[2]**

(c) Any **two** of:
- generally a piece of software
- can be provided by hardware with capabilities programmed in
- blocks access to data by particular users
- blocks access to parts of the system by all users
- increases security
- protects a system from hackers.
1 mark for each up to max 2 **[2]**

(d) Any **two** of:
- receives and verifies requests for data from users
- gets requested data and communicates it to users
- users can't get to data on the other network unless it comes through the proxy server
- stores frequently accessed pages.
1 mark for each up to max 2 **[2]**

7   **(a)**   Any **two** of:
- data transmission protocol
- addressing protocol
- uses hierarchical addressing
- designed for high speed communication
- sits at multiple layers.

1 mark for each up to max 2   **[2]**

     (b)   Any **two** of:
- widely used, eg on Internet
- makes connecting LAN to Internet more simple
- intranet uses IP addressing system
- high speed data transmission
- independent of hardware or operating system.

1 mark for each up to max 2   **[2]**

8   **(a)**   Any **two** of:
- program code
- replicates itself
- corrupts or destroys data
- attaches itself to other software.

1 mark for each up to max 2   **[2]**

     (b)   Any **two** of:
- email attachment
- floppy disk/memory stick
- downloading from Internet
- introduced by hackers.

1 mark for each up to max 2   **[2]**

     (c)   Any **two** of:
- anti-virus software (1) installed on every machine in the network (1) OR regularly updated (1)
- firewall (1) at point of connection to Internet (1)
- regular back-ups (1) so that data can be recovered if lost (1)
- staff training (1) to ensure that everyone knows how to prevent virus attack (1).

1 mark for each point to max 2 then 1 mark for expansion of each point   **[4]**

9   **(a)**   Any of:
- use in same way as Internet (1) users don't have to get used to a different system (1)
- allows employees to work from home (1) could increase productivity (1) OR reduce travelling time (1).

1 mark for point and 1 mark for expansion of point   **[2]**

     (b)   Web browser (1 mark)

          Any of:
- modem
- router.

1 mark   **[2]**

Section B

10   (a)   Any of:
- no need for wiring or trunking (1) less need to fix to walls or drill holes through walls (1) OR no tripping hazard (1)
- easier to position equipment within the room (1) because no cables attached (1).

1 mark for point and 1 mark for expansion of point   **[2]**

(b)   Any of:
- there could be interference (1) affecting users' ability to access the network (1)
- speeds could be slower (1) than cabled network speeds (1)
- the network could be accessed from outside (1) signals do not stop at the walls (1)
- health concerns (1) due to radiation (1).

1 mark for point and 1 mark for expansion of point   **[2]**

(c)   Any **two** of:
- wireless adapter card
- USB wireless adapter
- wireless access point/wireless bridge/wireless router
- transceiver.

1 mark each up to a max of 2   **[2]**

11   Two marks for any one difference identified from:
- physical = actual layout – logical = theoretical layout
- physical = real life – logical = how it is on paper
- any example described (eg underground map).   **[2]**

12   Any **two** of:
- speeds from 10Mbps (1) up to 1 Gbps (1)
- uses UTP (1) and RJ45 connectors (1)
- has used coax (1) and BNC connectors (1)
- IEEE 802.3 (1) defines standard (1)
- packets have six fields (1) data between 46 and 1500 bytes (1).

1 mark for point and 1 mark for expansion of point   **[4]**

13   Any of:
- used to check that what was sent (1) is the same as what is received (1)
- used to check validity of packet (1) if checksum is wrong an error has occurred in transit (1).

1 mark for point and 1 mark for expansion of point   **[2]**

14   **(a)**   Any **four** of:
- date of communication
- time of communication
- duration of communication
- connection used
- protocols used
- source of data
- destination of data
- size of data
- file type of data.

1 mark each to max 4 marks   **[4]**

     (b)   Any **two** of:
- help with diagnosis
- spot any recurring patterns
- spot any file types causing problems
- spot any times when problems occur.

1 mark each to max 2 marks   **[2]**

Coursework Unit Threshold Marks

Unit		Maximum Mark	a	b	c	d	e	u
G040	Raw	50	43	38	33	28	23	0
	UMS	100	80	70	60	50	40	0
G042	Raw	50	43	37	32	27	22	0
	UMS	100	80	70	60	50	40	0
G043	Raw	50	43	38	33	28	23	0
	UMS	100	80	70	60	50	40	0
G044	Raw	50	41	36	31	26	21	0
	UMS	100	80	70	60	50	40	0
G045	Raw	50	42	36	31	26	21	0
	UMS	100	80	70	60	50	40	0
G046	Raw	50	42	37	32	27	22	0
	UMS	100	80	70	60	50	40	0
G047	Raw	50	43	38	33	28	23	0
	UMS	100	80	70	60	50	40	0
G049	Raw	50	43	38	33	28	23	0
	UMS	100	80	70	60	50	40	0
G050	Raw	50	43	38	33	28	23	0
	UMS	100	80	70	60	50	40	0
G051	Raw	50	43	38	33	28	23	0
	UMS	100	80	70	60	50	40	0
G052	Raw	50	43	38	33	28	23	0
	UMS	100	80	70	60	50	40	0
G053	Raw	50	43	38	33	28	23	0
	UMS	100	80	70	60	50	40	0
G056	Raw	50	43	38	33	28	23	0
	UMS	100	80	70	60	50	40	0
G057	Raw	50	43	38	33	28	23	0
	UMS	100	80	70	60	50	40	0
G058	Raw	50	43	38	33	28	23	0
	UMS	100	80	70	60	50	40	0
G059	Raw	50	43	38	33	28	23	0
	UMS	100	80	70	60	50	40	0

Examined Unit Threshold Marks

Unit		Maximum Mark	a	b	c	d	e	u
G041	Raw	100	74	66	58	50	43	0
	UMS	100	80	70	60	50	40	0
G048	Raw	100	82	72	62	52	43	0
	UMS	100	80	70	60	50	40	0
G054	Raw	100	63	56	49	42	36	0
	UMS	100	80	70	60	50	40	0
G055	Raw	100	62	55	49	43	37	0
	UMS	100	80	70	60	50	40	0

Specification Aggregation Results
Uniform marks correspond to overall grades as follows.
Advanced Subsidiary GCE (H115):

Overall Grade	A	B	C	D	E
UMS (max 300)	240	210	180	150	120

Advanced Subsidiary GCE (Double Award) (H315):

Overall Grade	AA	AB	BB	BC	CC	CD	DD	DE	EE
UMS (max 600)	480	450	420	390	360	330	300	270	240

Cumulative Percentage in Grade

Advanced Subsidiary GCE (H115)

A	B	C	D	E	U
2.0	12.8	40.7	70.6	93.7	100.0
There were 425 candidates aggregating in Jan 2007.					

Advanced Subsidiary GCE (Double Award) (H315)

AA	AB	BB	BC	CC	CD	DD	DE	EE	U
4.2	8.3	8.3	20.8	29.2	50.0	66.7	75.0	95.8	100.0
There were 26 candidates aggregating in Jan 2007.									

For a description of how UMS marks are calculated see;
http://www.ocr.org.uk/exam_system/understand_ums.html

Statistics are correct at the time of publication.

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