



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme

June 2003

GCE

Computing

Unit CPT2

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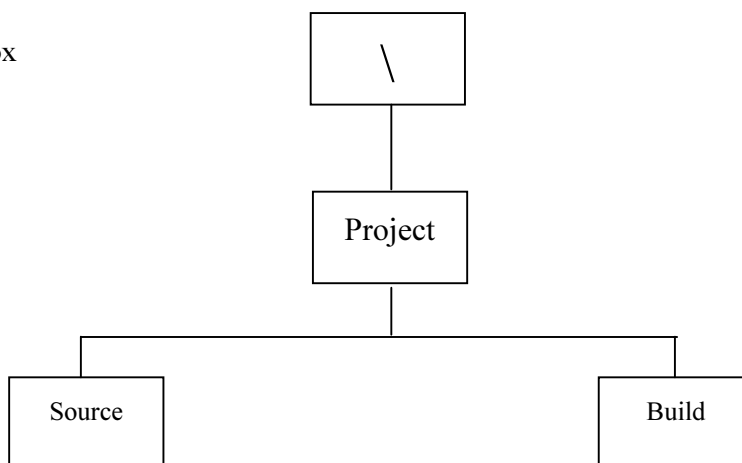
The following notation is used in the mark scheme

- ; - means a single mark;
- // - means alternative response;
- / - means alternative word or subphrase
- **A.** – means acceptable creditworthy answer;
- **R.** – means reject answer as not creditworthy;
- **I.** – means ignore.

- | | | | |
|---|--------------|---|----------|
| 1 | (a) | Presence check//Required field check;
Uniqueness check//No Duplicates;
List membership//Look-up list;
Range check//A. example//min..max..;
Format check//Picture check;
Type check//Numeric values only;
Existence check;
Field Width Check//Length check;
No Of Fields Check;
R. ComboBox, Input mask, AutoNumber, Check Digit, validation rule | 1 |
| | (b) | R. Easier to edit
Data is more consistent; R. Data remains consistent
Data is more easily shared;
Better validation//Data integrity controlled better;
Better support for ad-hoc enquiries;
Easier to add new field//easier to add new attribute;
Easier to change storage format of a field;
Easier to index different fields;
Easier maintenance;
Better security;
Less storage space required//Less redundancy//Less duplication//Less wasted space;
Many ways that data can be retrieved/queried;
Easier to manage backing up//Easier to manage restoring from backup;
Better control over redundancy;
Searching for information is easier; R. quicker | 1 |
| | Total | | 2 |

- 2 (a) (i) Disk drive attached to desktop computer (or alternative for desktop computer);
A. Disk attached to desktop computer **1**
- (ii) Disk drive located elsewhere on network;
 Remote disk drive;
 Disk drive attached to a server;
 Disk drive on another computer;
A disk drive accessible to stations on the network;
A. shared disk drive;
I. Virtual **1**
- (b) **R.** / but only penalise once.
R. names mis-spelt
- (i) C: or C:\ or C ; R. C:\> and C:\>Type.. **1**
- (ii) C:\Project\Source\MyFirst.Pas;
 C:\Project\Build\MyFirst.Arc; **1**
- (iii) **I.** \ before, after or both
 Project;
 Source;
 Build;
R. Root or \ **1**
- (iv) MyFirst.Pas; **1**
- (v) MyFirst.Arc; **1**
- (c) **A.** Source and Build interchanged

I. C or C: in \ box



1

Total 8

- 3 (a) (i) People listening to audio CD often want to know the title of the track without having to look this up on CD cover;
Additional information not recorded on CD cover may be available from on-line database;
User can get e-mails promoting products that user likes;
User may get sent information related to interests;
Filtered information can be sent to user based on user's interests; **1**
- (ii) Could gain statistics based on user interests;
Could expand product line to cater for users' interests (generating more revenue);
Could mean lower marketing costs for company because marketing is targeted;
Could mean cheaper audio CDs because company spends less on marketing (leading to more sales);
Could mean discounts on audio CDs for listener (leading to more sales);
Marketing information can be sold on;
A. Targeting related to costs/revenue answers
R. could sell more CDs unless justified with a response that maps onto above
R. Marketing can be targeted R. Can detect piracy R. Costs alone **1**
- (b) Invasion of privacy//user isn't aware of this taking place;
Computer owner's permission to link e-mail address to digital fingerprint not obtained;
Permission to place digital fingerprint on user's computer not obtained;
Because users may not want their tastes in music to be known; **1**
- Total 3**

- 4 (a) $1500 \times (17 + 2 + 1) = 1500 \times 20 = 30000$; Ignore additional answers in KB MB 1
- (b) (i) Any two reasons @ one each
A. For security if the answers below relating to security not given;
String form/plain text form of password is secure against disclosure whilst being sent across network // string form/plain text form of password cannot be detected/revealed whilst in transit;
String form/plain text form of password is secure against disclosure whilst stored on computer system // string form/plain text form of password cannot be revealed whilst stored on computer system;
Integer form of password takes up less storage space on computer system;
Integer form of password is quicker to send across network // so that fewer bytes have to be sent across network;
Easier for computer system to verify correct password entered;
Easier to process;
A. To encrypt password;
R. To encode password 2
- (ii) NB must be two bytes
Convert each character to its numeric equivalent/ASCII/Integer/Binary;
Perform some arithmetic(A. concat, A. algorithm, A example of arithmetic, R. process no, R. Translate) on the number string;
Reduce/Map arithmetic result onto two-byte integer (R. To give a two byte no)
range Or example of mapping; 3
- (iii) To prevent reverse hashing revealing the string form/plain text form of the password (emphasis is on revealing the password);
R. For security reasons
R To stop hacking
A Hackers may gain access to password 1
- (c) Process deletes UserId, password records from CurrentUserIds file;
Produces copy and takes old file off-line;
Process removes redundant data
A. Make Old UserIds unusable;
A. Write a new file with data from CurrentUserIds file but exclude changes from UserIdsToBeUpdated 1

4 (d)

```

Open Transaction File(UserIdsToBeInserted) for reading
Open Old UserIds File(CurrentUserIds) for reading
Open New UserIds File(NewUserIds) for writing
Read First Old UserIds File Record 1
While Not End of File Transaction File Do 1
Repeat → Read Next Transaction File record 1
      If Next Transaction File Record.UserId > Old UserIds File Record.UserId 1
      Then
          Begin
              Write Old UserIds File Record to New UserIds File 1
              Read Next Old UserIds File Record 1
          End
      Else Write Next Transaction File Record to New UserIds File 1
      EndWhile
      Copy remainder of Old UserIds File to New UserIds File 1
      Close all files
      Archive Old UserIds file
      Rename New UserIds File as CurrentUserIdFile
  
```

Repeat

Until Next Transaction File Record.UserId < Old UserIds File Record.UserId

A. Read Next Transaction File Record attached to Else/associated with Write Next Transaction File Record to New UserIds File

Alternative Answer (There may be others - map other alternative answers onto mark scheme given above and below)

```

Read First Old UserIds File Record 1
While Not End of File Transaction File Do 1
    If Next Transaction File Record.UserId > Old UserIds File Record.UserId 1
    Then
        Begin
            Write Old UserIds File Record to New UserIds File 1
            Read Next Old UserIds File Record 1
        End
    Else
        Begin
            Write Next Transaction File Record to New UserIds File 1
            Read Next Transaction File Record 1
        End;
    EndWhile
    Copy remainder of Old UserIds File to New UserIds File 1
While Not End of File Transaction File Do 1
    Read next Transaction File Record 1
    Read Next Old UserIds File Record 1
    While Transaction File Record.UserId < Old UserIds File Record.UserId Do 1
        Write Transaction File Record to New UserIds File 1
        Read Next Transaction File record 1
    EndWhile
    WriteUserIds File Record to New UserIds File Record 1
EndWhile
Copy remainder of Old UserIds File to NewUserIds File 1
Read First UserIds File Record 1
While Not End of File Transaction File Do 1
    Read Next Transaction File Record 1
    Do While Next Transaction File Record.UserId > Old UserIds File Record.UserId 1
        Write Old UserIds File Record To New UserIds File 1
        Read Next Old UserIds File Record 1
    EndWhile
    Write Next Transaction File Record To New UserIds File 1
EndWhile
Copy remainder of Old UserIds File to NewUserIds File 1

```

Total 14

- 5 A. Law/Legislation/Act**
- (a) Information/ /Data Protection (Act); I. dates **1**
- (b) Patents legislation/ /Intellectual Property legislation/ /Copyright, designs & Patents (Act); **1**
- (c) Computer Misuse (Act); **1**
- (d) Copyright legislation/ /Copyright, Designs & Patents (Act); **1**
- Total 4**
- 6 (a)** Any two at two each; If entrance method doesn't match exit method mark one wrong and the other correct
- R. Voice R. Written to ticket**
 Computer system/Printer prints number on ticket at entrance;
 Driver types number into system using a keypad at exit barrier;
- Computer system encodes number on a magnetic stripe on ticket at entrance;
R. Magnetic card
 Ticket number read by a magnetic stripe reader at exit//inserted into a magnetic stripe reader at exit; A magnetic strip/stripe scanner
- Computer system/Printer prints number printed on ticket at entrance;
 Number read by an optical character reader/OCR at exit//ticket inserted into an optical character reader at exit;
- Computer system/Printer prints number in barcode form on ticket at entrance;
 Number read by barcode reader at exit//ticket inserted into barcode reader at exit;
- Computer system/Printer at entrance punches holes on ticket which are a coded form of number//Kimbal tag produced at entrance which encodes number;
 Number read by sensor (mechanical or optical) at exit//ticket inserted into sensor at exit//Number read by Kimball tag reader at exit;
- Computer system/printer prints number using magnetic ink;
 At exit MICR reader reads number;
- Computer system/printer prints marks (encoding number) on ticket;
 At exit, OMR device is used; **4**

(b)

R. any other data types. Mark is for field name + correct data type.

NB synonyms for RandomNumber must include Number, e.g. IDNo,

TicketNo, Number. A. RandomInteger, R e.g. Vehicle ID A. VehicleIDNo

Record

RandomNo : Integer; R. anything else 1

A. DateTicketWasIssued

CurrentDate :
String/Date/DateTime/TDateTime/TDate; 1

ArrivalTime :
String/Integer/Time/DateTime/TDateTime/TTime;1

LengthOfTime/LengthOfStay/TimeStayed : Integer;
R. anything else 1

Cost/AmountToPay : Integer/BCD; 1

End;

A. Alphanumeric for String

R. Text **R.** LeavingTime **R.** Binary, Byte, LongInteger

R. Date for FieldName

R. Date/Time but don't penalise twice

Total 5

(c) **R.** FILE as a substitute for record

(i) Any record can be accessed independently of any other record;
Record may be accessed without having to read any other record first;
Previous (n-1) records don't have to be read to first to access nth record;
Records in the file may be accessed in any order;
A. Records may be accessed randomly
R. Can go straight/directly to record
R. Do not have to start from beginning of file 1

(ii) File in which records may be accessed only in the order in which they were written to the file;
File in which records may be accessed only by starting from the beginning of the file;
A. A file in which new records can only be appended to end of file;
A. Records may only be accessed in chronological order; 1

(iii) 1000 (nothing else qualifying) 1

(iv) Random number is the disk address of the record in the file//random number is the position/address/location/BlockNo/SectorNo of the corresponding record in the file//random number is the relative address of the record in the file
Number is position of the record; 1

Total 13

- 7 (a) Any two points at one each.
- Ability to present data in a clear and organised fashion/generates graphs;
Automatic recalculation; **R** Automatic calculation
'What If' facility;
Formulae/Functions; **A**. Mathematical equations
Macros;
Modelling/linking worksheets;
Can import data from other packages;
Supports goal seeking;
A. Can see all data and can evaluate data
R. Can see all data
R. If statements for decisions 2
- (b) (i) NB Must be perfect
IF(\$B4<\$D\$7,"F",IF(\$B4<\$D\$8,"P","M")); 1
- (ii) NB no quotes (penalise once)
Cell C4 = F ; 1
Cell C5 = M ; 1
- (c) NB no quotes (penalise if not penalised in (ii))
Cell C4 changes to P 1
- Total** 6
- 8 (a) A card that is embedded with a microprocessor/processor/cpu and memory chip;
A card that is embedded with a memory chip with non-programmable logic;
A card that is embedded with a memory chip and logic circuits ;
R. Card that remembers something 1
- (b) CallId;
SimCardNo, Date, Time; 1
- (c) (i) An attribute/field in one relation/table that is the primary key in another relation/table; 1
- (ii) SimCardNo 1
- (d) (i) Changes/Updates are made in a timely manner ;
Changes are made immediately/instantaneously/in an instant ;
Changes are made as they happen;
R. updated continuously 1

- (ii) Processing which is not carried out until all the data have been entered into system;
Processing is applied to all the transactions in one go/at one time;
Processing that proceeds without human interaction;
R. Collected – must be entered
R. Processed in batches **1**

- (iii) Network needs to know the current base station of each mobile phone;
Network needs to know the current location of each mobile phone;
To keep location information current;
Because user may change location; **1**

- (e) (i) To speed up searching/queries;
To speed up access;
R. To speed up processing **1**

- (ii) SimCardNo **1**

- (f) (i) 2 **1**

- (ii) **A. ✓ or ? or * or x in SimCardNo and ServiceType fields**
Column headings must be accurate
A. <= 28/02/2002

SimCardNo	ServiceType	ActivationDate
		< 01/03/2002

- ; ; ;
- (g) (i) What: Calculated digit// digit calculated from other digits in MobilePhoneSerialNo; **1**

 - (ii) Purpose: To check MobilePhoneSerialNo not corrupted;
To check integrity in MobilePhoneSerialNo;
To detect error in MobilePhoneSerialNo;
To check MobilePhoneSerialNo has been recorded/input correctly;
R. To make sure(ensure) data/MobilePhoneSerialNo is not corrupted/erroneous
R. To check number is valid/correct R. To check for correctness **1**

Total 15