

### NATIONAL SENIOR CERTIFICATE

# **GRADE 11**

## **NOVEMBER 2013**

# **INFORMATION TECHNOLOGY P1**

MARKS: 150

TIME: 3 hours

This question paper consists of 9 pages.

### **INSTRUCTIONS AND INFORMATION**

- 1. This is a three-hour examination. Because of the nature of this examination it is important to note that you will NOT be permitted to leave the examination room before the end of the examination session.
- 2. You require the files listed below in order to answer the questions. They are EITHER issued to you on a CD OR the invigilator/educator will tell you where to find them on the hard drive of the workstation you are using OR in which network folder it is. If the files are issued to you on a CD, you need to copy them onto your hard disk.

#### **QUESTION 1**

Question1\_U.pas Question1\_U.dfm Question1\_P.dpr

#### **QUESTION 2**

Library.mdb Question2\_U.pas Question2\_U.dfm Question2\_P.dpr

#### **QUESTION 3**

Books.txt Question3\_U.pas Question3\_U.dfm Question3\_P.dpr

### **QUESTION 4**

Question4\_U.pas Question4\_U.dfm Question4\_P.dpr

- 3. Save your work at regular intervals as a precaution against power failures.
- 4. Read ALL the questions carefully. Do only what is required by the question.
- 5. During the examination you may use the manuals originally supplied with the hardware and software. You may also use the HELP functions of the software. You may NOT refer to any other resource material.

#### SCENARIO

A library is an important source of information, and although computers have become so accessible to many, books are still a very good resource. There are many types of books available in a library, for example: fiction, non-fiction, reference material as well as magazines and some even make video/CDs/DVDs available for use.

#### QUESTION 1: DELPHI

All learners are allowed to use the computers in the library for research purposes. They have a certain time limit to use the computers depending on their respective grade. They will also receive a once-off username and password.

Open the **Question1\_U.pas** and **Question1\_P.dpr** files and complete the program.

The learners are expected to enter their names and surnames as well as select the grade they are in. The learners must also indicate whether they are working on a project. If this is the case they are allowed to print without making any payment. If the learner wants to print any other work, it will cost them R0,40 per page.

The username is created by making use of their surnames and initials of their names. The password is created by randomly generating a number between 1 and 1 000 000.

The time allowed on the computers is dependent on the grade that the learner is in. Gr 8 and Gr 9: 15 minutes; Gr 10: 20 minutes; Gr 11: 25 minutes and Gr 12: 30 minutes.

Complete the code for the 'Log in' button to produce similar output as shown below:

😼 QUESTION 1		😿 QUESTION 1	- • •
Name: Sally Sumame: Knight	Grades ○ Gr 8 ○ Gr 9 ○ Gr 10 ⓒ Gr 11 ○ Gr 12	Name: Sally Grades Grades Surname: Knight Gr10 C Gr11 C Gr12	
Welcome Sally Knight Your once-off username is: KnightS Your once-off password is: 366783 You are allowed to work for 25 minute Printing costs will be R0.40 per page	28.	Welcome Sally Knight Your once-off username is: KnightS Your once-off password is: 722169 You are allowed to work for 25 minutes. There will be no printing costs	

- Enter your name and surname as a comment in the first line of the program.
- Save your program.
- Make a printout of the code, if required.

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### **QUESTION 2: DATABASE AND DELPHI**

The database, **Library.mdb**, which contains data related to this topic, has been supplied to you in a folder named **Question 2**.

The **tblbooks** table stores data about all the books in the library. The fields in this table are defined as follows:

 tblbooks : Table		
Field Name	Data Type	
Title	Text	
AuthorID	Text	
YearPublished	Number	
Language	Number	1 - English 2 - Afrikaans
ShelfNumber	Text	Shelf where book can be found

The following table is an example of the data contained in the table named **tblbooks**.

Title	AuthorID	YearPublished	Language	ShelfNumber
Incle	Authorit	rearPublished	Language	Sneinvumber
The lvory trail	391	1967	1	BUL 591.9
The Power of positive thinking	2037	1966	1	PEA 170
All about Napoleon Bonaparte	2692	1967	1	NAP 944.05
Three great animal stories	451	1966	1	CAR 591.9
Power of three	2253	1968	1	SAV 826
Doctor Brad's nurse	40	1966	1	AME 826
The Doctor's secret	717	1967	1	DEA 826
Little Lord Fauntleroy	407	1966	1	BUR 826
Christy	1758	1968	1	MAR 826
Nurse Sally's last chance	799	1967	1	DUR 826
The Stratton story	424	1967	1	CAD 826
My Secret love	1348	1967	1	HOY 826
Black mischief	2628	1962	1	WAU 826
Beyond the Chindwin	876	1967	1	FER 940.63
Double-crossers of ghost tree	2536	1965	1	TUT 826
When Marnie was there	2195	1967	1	ROB 826
Where eagles dare	1710	1968	1	MACL826

You are supplied with an incomplete Delphi program with a unit named **Question2\_U** and a project named **Question2\_P** in the folder named **Question 2**. Open the incomplete program.

- The program should be able to connect to the database named Library.mdb.
- When you do QUESTION 2.1 and you find that the connectivity is not in place, use the following steps to establish connection with the database:
  - Click on the ADOTable component named **adolibrary**.
  - Click on the Ellipse button (three dots) to the right of the 'ConnectionString' property in the Object Inspector.
  - Click on the Build button which takes you to the Data Link Properties dialogue box.
  - Select Microsoft Jet 4.0 OLE DB Provider and click on Next.
- The first option on the Connection tabsheet allows you to browse and find the Library.mdb file.
- Remove the user name Admin.
- Click on the Test Connection button.
- Click OK on each one of the open dialogue windows.

NOTE: If you cannot establish connectivity with the database at all when you execute the program you must still do and submit the programming code for marking.

2.1 Complete the code in the **How many books?** Menu Option to display how many books there are in the library.

Example of output:

QUESTION 2	
How many books? Percentage Afr books Books by Author Published > 2000	
Title	<b>^</b>
Cool Stuff Exploded	
Daughters-in-law	
Coconut	
Coping with stress	
Morning glory	
Fang	
Pendragon	
The Last song	
The King's Speech	
Second Glance	
Mystery	
Kate	
I Remember, Daddy	
The Privilege of Youth	
Call me evil, let me go	
▶ return	
•	•
1571 books in the library	Calculate

2.2 Complete the code in the **Percentage Afr Books** Menu Option to display the percentage of Afrikaans books in the library.

Example of output:

QUESTION 2	• ×
How many books? Percentage Afr books Books by Author Published > 2000	
Title	
Cool Stuff Exploded	- ^
Daughters-in-law	-
Coconut	- 1
Coping with stress	-
Morning glory	-
Fang	-
Pendragon	-
The Last song	-
The King's Speech	-
Second Glance	-
Mystery	
Kate	- 1
I Remember, Daddy	-
The Privilege of Youth	-
Call me evil, let me go	-
▶ return	
28% Afr Books	

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2.3 Complete the code in the **Books by Author?** Menu Option to display how many books of a specific author are available in the library. The AuthorID must be entered using an EditBox.

Example of output if the AuthorID 2354 (Wilbur Smith) is entered:

How many books?     Percentage Afr books     Books by Author     Published > 2000       Title	QUESTION 2	
Title         Cool Stuff Exploded         Daughtersin-law         Coconut         Coping with stress         Morning glory         Fang         Pendragon         The Last song         The King's Speech         Second Glance         Mystery         Kate         I Remember, Daddy         The Pivilege of Youth         Call me evil, let me go         return		
Cool Stuff Exploded         Daughters-in-law         Coconut         Coping with stress         Morning glory         Fang         Pendragon         The Last song         The King's Speech         Second Glance         Mystery         Kate         I Remember, Daddy         The Privilege of Youth         Call me evil, let me go	How many books? Percentage Afr books Books by Author Published > 2000	
Daughters-in-law         Coconut         Coping with stress         Morning glory         Fang         Pendragon         The Last song         The King's Speech         Second Glance         Mystery         Kate         I Remember, Daddy         The Privilege of Youth         Call me evil, let me go	Title	<u> </u>
Daughters-in-law         Coconut         Coping with stress         Morning glory         Fang         Pendragon         The Last song         The King's Speech         Second Glance         Mystery         Kate         I Remember, Daddy         The Privilege of Youth         Call me evil, let me go	Cool Stuff Exploded	
Coping with stress Morning glory Fang Pendragon The Last song The King's Speech Second Glance Mystery Kate I Remember, Daddy The Privilege of Youth Call me evil, let me go ▶ return		
Morning glory         Fang         Pendragon         The Last song         The King's Speech         Second Glance         Mystery         Kate         I Remember, Daddy         The Privilege of Youth         Call me evil, let me go         I return	Coconut	
Fang         Pendragon         The Last song         The King's Speech         Second Glance         Mystery         Kate         I Remember, Daddy         The Privilege of Youth         Call me evil, let me go         I return	Coping with stress	
Pendragon         The Last song         The King's Speech         Second Glance         Mystery         Kate         I Remember, Daddy         The Privilege of Youth         Call me evil, let me go         I return	Morning glory	
The Last song The King's Speech Second Glance Mystery Kate I Remember, Daddy The Privilege of Youth Call me evil, let me go return ✓	Fang	
The King's Speech Second Glance Mystery Kate I Remember, Daddy The Privilege of Youth Call me evil, let me go ▶ return <	Pendragon	
Second Glance Mystery Kate I Remember, Daddy The Privilege of Youth Call me evil, let me go ▶ return	The Last song	
Mystery Kate I Remember, Daddy The Privilege of Youth Call me evil, let me go I return	The King's Speech	
Kate I Remember, Daddy The Privilege of Youth Call me evil, let me go I return	Second Glance	
I Remember, Daddy The Privilege of Youth Call me evil, let me go ▶ return <	Mystery	
The Privilege of Youth Call me evil, let me go  return  <	Kate	
Call me evil, let me go  return  Call me evil, let me go	I Remember, Daddy	
Image: state	The Privilege of Youth	
	Call me evil, let me go	
	▶ return	
,	2354 The author wrote 6 books	Process

2.4 Complete the code in the **Published > 2000** Menu Option to display all the books in the library that were published after 2000.

ow many books? Perce	entage Afr books   Books by Author	Published > 2000
Title		
Ripley's Believe it or no	ət	
Cool Stuff Exploded		
Daughters-in-law		
Coconut		
Coping with stress		
Morning glory		
Fang		
Pendragon		
The Last song		
The King's Speech		
Second Glance		
Mystery		
Kate		
I Remember, Daddy		
The Privilege of Youth		
Call me evil, let me go		
return		
∢ 🔲		
	293 published after 2000	Calculate

Example of output:

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- Enter your name and surname as a comment line in the first line of the program.
- Save your program.
- Make a printout of the code, if required.

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#### **QUESTION 3: DELPHI PROGRAMMING**

This question will perform many different functions that are required in a library. All the information required is stored in an array called **arrbooks**.

The layout of the array is as follows: title; surname, initials

3.1 Write code for the **Create Book Code** Menu Option which will get the book title and place it in an additional array named **arrtitle** as well as the author and place it in another array named **arrsurname**, from the array called **arrbooks**.

The book code must then be created by taking the first three letters of the author's surname and adding the counter at the end. The title and the book code must be neatly displayed in the richedit making use of columns.

V Question 3		
Create Book Code Sort acc Author	Generate Once-off Password	Fines Search
Twilight Children	Gor79	*
Nights in Rodanthe	Bai80	
Daddy's Rules	Gor81	
Girl in the Cellar	Gor82	
Safe Harbour	Gor83	
Nights In Rodanthe	Gos84	
Obsession	Gou85	
Left Neglected	Gou86	
Breaking Dawn	Gou87	
The sacrifice	Gou88	
Sachin	Gou89	
His Father's Son Red Lotus	Gou90 Bai91	
	Gra92	
Her Daughter's Dream Titanic	Gra93	
The Making of Royal Romance	Gra94	
An underwold Exposed	Gra95	
To The Point	Gra96	
Encyclopedia of Magic and Conjuring	Gra97	
The 19th Wife	Gra98	
Mean Girls	Gra99	
Harvesting the Heart	Gra100	
Life Talk For A Daughter	Gra101	E
Cry, the beloved country	Bai102	
Ripley's Believe it or not	Gra103	
<u> </u>		<b>T</b>

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3.2 Write code for the **Sort acc Author** Menu Option which will display the books according to the author's surname alphabetically. Display the author's surname and book title neatly in columns.

Question 3			
reate Book Code	Sort acc Author	Generate Once-off Password	Fines
Aarons		The Ivory trail	
Adams		The Power of positive thinking	
Bagley		All about Napoleon Bonaparte	
Bagnall		Son En Smarag	
Bailey		Air Head Runaway	E
Bailey		The Alternate Day Diet	
Bailey		Hannah's Choice	
Bailey		Book of the Dead	
Bailey		Secrets to the Grave	
Bailey		Nights in Rodanthe	
Bailhache		Red Lotus	
Baird		Cry, the beloved country	
Gear		Three great animal stories	
Geddes		Power of three	
Gee		Doctor Brad's nurse	
Geissler		The Doctor's secret	
Geldenhuys		Christy	
Geldenhuys		Little Lord Fauntleroy	
Georgano		Nurse Sally's last chance	
George		The Stratton story	
George		My Secret love	
George		Tussen die tuine	
Geraghty		Biesiesvlei se mense	
Geras		Maltrappe op Maasdorp	
Gerber		Gebonde jare	
Gericke		Totdat die skaduwees oorwaai	-
Germisbuvs		Die ver reis	•

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3.3 Write code for the **Generate Once-Off Password** Menu Option which will ask the user (librarian) to enter their name and surname in lowercase. The password must then be generated as follows:

The first three letters of the surname (the second letter must be in capitals) + random number between 0 and 9 + first two letters of the name (first letter in capitals) + random number between 0 and 99 + '#.'

Display a message indicating what the user's password will be. The name and password must also be stored in an array named **arrpassword** (method scope).

For example:

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Enter name and surna	ame 🗾 📉
lower case ONLY jack black	
OK	Cancel

jack black's password is bLa1Ja72#
ОК

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3.4 Write code for the **Fines** Menu Option which will ask the user to enter the date a book was taken out of the library. It must then calculate and display the amount that needs to be paid if the book is overdue. If the difference between the current date and the date (MM/DD) the book was taken out on is 14 days or less, there will be no fine. If the difference is between 14 and 21 days (included) then the fine will be R1,50 per day that it is late. If the book is more than 21 days late, then the fine will be R2,50 per day it is late. Once the fine has been calculated, display the date the book was taken out on, date the book was returned as well as the amount that is needed to be paid.

	🌈 Question 3
Enter date book was taken out 🛛 🗶	<u>Create Book Code</u> Sort acc Author Generate Once-off Password Fines Search
мм/DD [10/02]	Date Out: 10/02 Date In: 16/10 R 32.50
OK Cancel	

3.5 Write code for the **Search** Menu Option which will search for a book title as entered using an InputBox. A suitable message must be displayed if the book is found as well as if the book is not found.

Enter Book Title	Question
Twilight Children	Book found!
OK Cancel	OK
Enter Book Title	Question3_p
Twilight	Sorry, the book is not in the library.
OK Cancel	ОК (10)

- Enter your name and surname as a comment line in the first line of the program.
- Save your program.
- Make a printout of the code, if required.

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#### **QUESTION 4: DELPHI PROGRAMMING**

International Standard Book Number or commonly known as ISBN is a unique number, consisting of 13 digits, assigned to a book. Each ISBN has a check digit (13<sup>th</sup> digit). There is a calculation to check whether the first 12 digits equal the check digit which then indicates that the ISBN is correct or valid.

#### Method: (Only use the first 12 digits)

Each digit from left to right is alternatively multiplied by 1 or 3, and then the products are added and divided by 10 to give a remainder ranging from 0 to 9. The remainder subtracted from 10 will result in a single digit which should equal the check digit.

Example: ISBN is 9780306406157  $9 \times 1 + 7 \times 3 + 8 \times 1 + 0 \times 3 + 3 \times 1 + 0 \times 3 + 6 \times 1 + 4 \times 3 + 0 \times 1 + 6 \times 3 + 1 \times 1 + 5 \times 3$  = 9 + 21 + 8 + 0 + 3 + 0 + 6 + 12 + 0 + 18 + 1 + 15 = 93 93 / 10 = 9 remainder 3 10 - 3 = 7 \*if this answer = 10 then it must be changed to 0\* 7 equals 13<sup>th</sup> digit of ISBN  $\rightarrow$  ISBN correct

Complete the incomplete program to check whether the ISBN that is entered, is correct using the above method of calculation. If the ISBN is correct it must be displayed in the appropriate richedit component. If the ISBN is incorrect it must then be displayed in the appropriate richedit component. The incorrect ISBN must be corrected by replacing the incorrect check digit with the check digit which was calculated. Display the corrected ISBN below the incorrect ISBN as shown in the example below.

W QUESTION 4	
	9781919867538 Check ISBNs
CORRECT:	INCORRECT:
9780306406157 9781919867380	9780306406141 Correct ISBN: 9780306406140 9781919867538 Correct ISBN: 9781919867533
	Lose

- Enter your name and surname as a comment line in the first line of the program.
- Save your program.
- Make a printout of the code, if required.

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**TOTAL: 150**