



education

**Department:
Education
PROVINCE OF KWAZULU-NATAL**

FINAL EXAMINATION

NOVEMBER 2019

INFORMATION TECHNOLOGY

GRADE 11

PAPER 1

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MARKS: 130

DURATION: 3 HOURS

This question paper consists of 12 printed pages including the cover page.

INSTRUCTIONS AND INFORMATION:

1. This question paper is divided into THREE questions. Answer ALL THREE questions.
2. This paper is set in programming terms that are specific to the Delphi Programming Language (utilizing the IDE *Embarcadero Delphi 2010* or later).
3. Make sure that you answer the questions according to the specifications that are given in each question. Marks will only be awarded according to the set requirements.
4. Answer only what is asked in each question. For example, if the question does not ask for Data validation, then no marks will be awarded for data validation.
5. Your programs must be coded in such a way that they will work with any data and not just the sample data supplied or any data extracts that appear in the question paper.
6. Routines such as search, average and selection must be developed from first principles. You may not use the built-in features of a programming language for any of these routines.
7. You must save your work regularly (at least once every 5 minutes) on the disk you have been given, or the disk space allocated to you for this examination.
8. Make sure that your name appears as a comment in every program that you code as well as on every event indicated.
9. At the end of this examination session, you must hand in a disk/CD/DVD/flash disk with all your work saved on it OR you must make sure that all your work has been saved on the disk space allocated to you for this examination session. Ensure that all files can be read.

DATA FILES

The files that you need to complete this question paper have been given to you on a disk / CD / DVD / flash disk or on the disk space allocated to you.

The files are provided in a folder named: “**GR11 DATAFILES 2019**”. Inside this folder are FOUR subfolders: **Question1, Question2, Question 3**. DO NOT MODIFY THE STRUCTURE OF THESE FOLDERS.

Ensure that ALL data files are present before beginning the examination.

IMPORTANT FILES PROVIDED:

Folder	Files	Purpose
Question1	Q1_P.dproj	Main Project File (Open this file to answer Question 1)
Question2	Q2_P.dproj	Main Project File (Open this file to answer Question 2)
	WaterParkDB.mdb	Microsoft Access Database File
Question3	Q3_P.dproj	Main Project File (Open this file to answer Question 3)
	VisitorRideLog.txt	Textfile used in question 3.1.

Scenario

A new waterpark has been introduced in Durban. The waterpark is running a competition whereby schools of KZN who offer Information Technology are required to create an application to meet the needs of their new waterpark facilities. Your school has decided to participate. You are required to fulfil the four sections that follow in order to be in the running for a full access pass for a year to their waterpark facilities.

QUESTION 1: General Programming Skills

1.1 Button: Submit

A customer will select a type of ticket required using criteria based on the type of access and age group. Once this data is submitted the customer will view an invoice with the total cost of tickets purchased. Complete the following to allow the system to work as explained:

- a) ~~Extract~~ the type of ticket from **cmbAccessType** (2)
- b) ~~Using global variables, extract~~ the number of tickets required per age group from TSpinedits, **sedAdult, sedChild, sedPens** (3)
- c) Calculate and display on **redPurchaseSummary** total cost per age group, formatted to **2 decimal places**. If no tickets are purchased for an age group, then no display should appear for this age group. (15)

Read the criteria provided below:

Ticket Access	Adult	Child	Pensioner
Full Access	R 220	R 110	Adult less 25%
Rides Only	R 150	R 75	
Aquarium Only	R 100	R 50	
Restaurant/Mall Only	R 40	R 20	

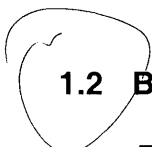
2 my students TB

- d) ~~Where applicable display on redPurchaseSummary~~ the discount amount given to pensioners, formatted to **0 decimal places**, with an appropriate message. (2)
- e) Calculate and display on **redPurchaseSummary** the total cost of the overall purchase, formatted to **2 decimal places**. (8)

Note:
Follow the sample output to achieve the correct display

SAMPLE OUTPUT:

Question 1.1. Subtotal: [30]



1.2 Button: Process Area Allocation

Rest and Relaxation (R N' R) areas are allocated to visitors to rest, relax or keep belongings in between the use of the water park facilities.

Each area allows for a maximum of *6 people*.

Complete the questions that follow to allocate an area to visitors appropriately:

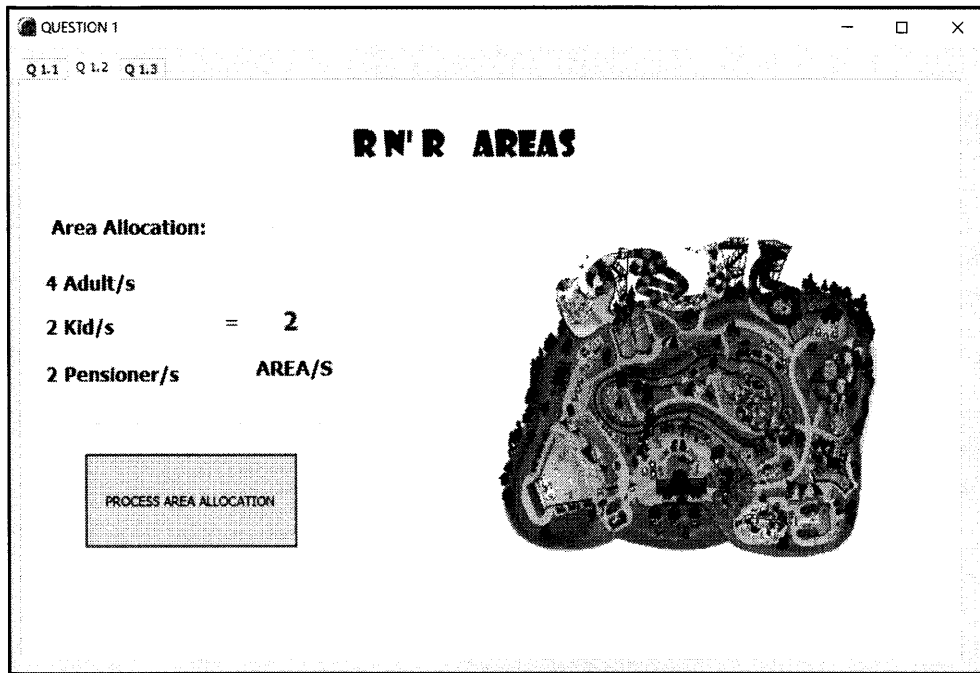
- a) Display the number of tickets purchased in question 1.1 on the corresponding labels;
IbINumAdults, IbINumChildren, IbINumPens (8)
- b) Display on **IbINumOfAreas** the number of areas allocated to the tickets displayed on the labels mentioned in question a) (2)

Minimum 1 person, Maximum 6 people = 1 area

*Insert
(name):=*

Sample Output On Page 5...

SAMPLE OUTPUT:



Question 1.2. Subtotal: [10]

1.3 Visitors have complained that there is always a line at a ride and would like to know how long they would have to wait until it is their turn to get on to the ride.

IstRides contains the names of all rides along with the time taken to complete a ride in the following format:

Ride Name-Seconds
 e.g. *Up Hill Water Coaster-67*

- a) **Extract** the chosen ride from **IstRides**. Declare *local variables* for the ride name and time taken to complete a ride, both of type string. (6)
- b) An array called **arrPplWaiting** has been globally declared and contains the people waiting in line at each ride in the park. (10)

Position 1 of the array corresponds to the 1st ride on **IstRides** and so on.

e.g. Uphill Water Coaster has 35 people waiting with 10 second completion time

Calculate the waiting time using the following formula:

**Waiting Time =
 Time Taken To Complete Ride * Number Of People Waiting**

Question 1.3 continues on pg 6...

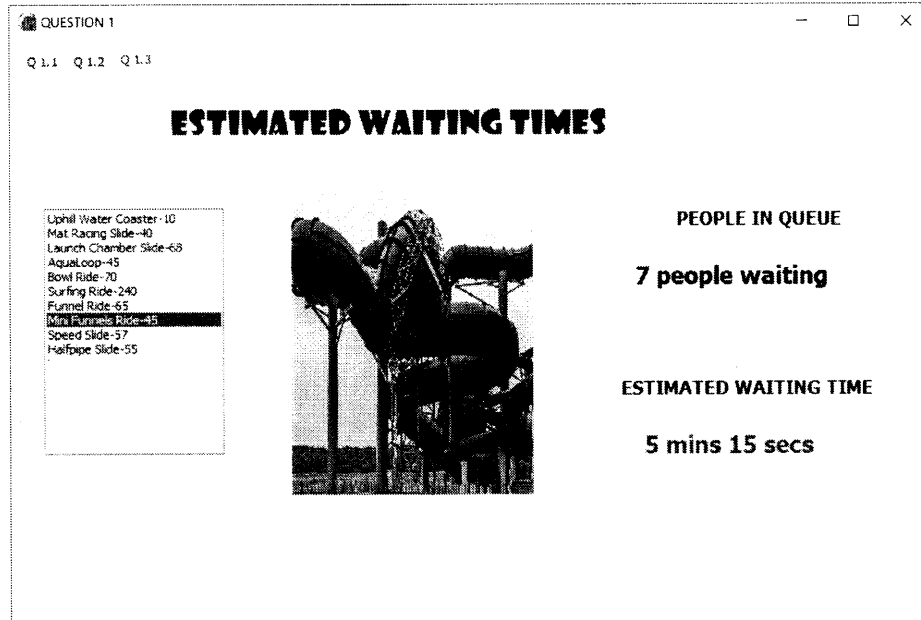
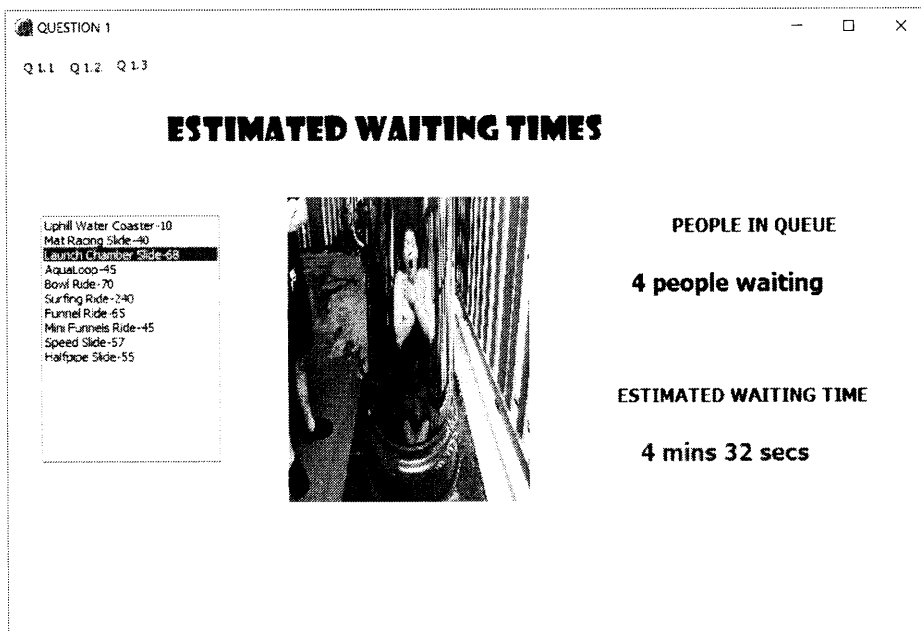
Note:

No Date datatypes to be used.

Waiting time must be displayed in minutes and seconds.
 Where seconds are less than 60 display 0 mins and corresponding seconds. There are 60 seconds in a minute.
 So 4.5 minutes is 4 mins 30 secs.

- c) Display the number of people waiting on **lblPplWaiting** and estimated waiting time on **lblTime** (2)

SAMPLE OUTPUT:



Question 1.3 Subtotal: [16]
 QUESTION 1 TOTAL: [56]

QUESTION 2: Database Programming (53 marks)

Scenario

A database called **WaterParkDB** has been provided by the water park. This database consists of two tables. **RidesTb** which contains data about the rides within the park and **VisitorsTb** that contains data about visitors who visit the park.

The database is as follows:

Database: WaterParkDB

RidesTb

Field Name	Data Type	Description
RideID	Text	Unique number allocated to each ride at the park
RideName	Text	Name of a ride
SectionOfPark	Text	The section of the park in which the ride is situated. Sections A to D are currently in use.
ScareFactor	Number	How fast or scary a ride is rated from 1 (least scary/fast) to 5 (most scary/fast)
RideCompletionTime	Number	How long it takes one person to complete a ride (measured in seconds)

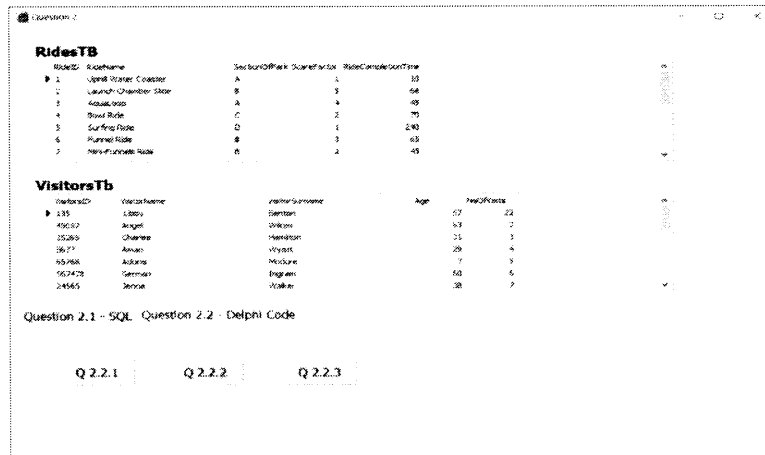
VisitorsTb

Field Name	Data Type	Description
VisitorID	Text	Unique number to identify each visitor
VisitorName	Text	Visitor's name
VisitorSurname	Text	Visitor's surname
Age	Number	Visitor's age
NoOfVisits	Number	Number of overall visits to the water park per visitor

2.1 Tab sheet : Question 2.1 – Delphi code [30 marks]

In this section only **Delphi programming code** may be used to answer QUESTION 2.1.1 to QUESTION 2.1.3.

The user interface for QUESTION 2.1 is shown below.



ADORidesTb and **ADOVisitorsTb** are the data aware components used to access data in the database.

~~2.1.1~~ **Button: 2.1.1**

(7)

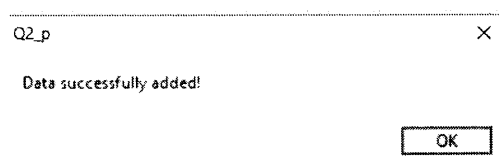
Write code to **ADD** a record to the **RidesTb** table. The data of the ride to be added is provided below.

RideID: 34763
 RideName: Crazy Splash Fest
 SectionOfPark: D
 ScareFactor: 5
 RideCompletionTime: 49

Display an appropriate message.

SAMPLE OUTPUT

RideID	RideName	SectionOfPark	ScareFactor	RideCompletionTime
5	Surfing Ride	D	1	240
6	Funnel Ride	B	4	65
7	Mini-Funnels Ride	B	3	45
8	Speed Slide	D	4	57
9	Halfpipe Slide	C	3	55
10	Mat Racing Slide	B	2	40
▶ 34763	Crazy Splash Fest	D	5	49



2.1.2 Button: 2.1.2 (11)

Write code to UPDATE all records in the **RideTb** to **ScareFactor + 1** where the **RideCompletionTime** is greater than 49 seconds.

2.1.3 Button: 2.1.3 (13)

Write code to calculate and display on **redDisplay** the average time (in **seconds**) it would take to complete all rides at the water park.

SAMPLE OUTPUT

```
Average Time Taken to complete a rides at the  
water park is:  
75.2 secs
```

update

QUESTION 2 TOTAL: [31]

QUESTION 3: Linked/Parallel Arrays And Textfiles (43 marks)

Scenario

Information about visitors and the rides they have used has been recorded for statistical purposes. This data has been recorded in a textfile. You are required to extract the data from the textfile and answer the questions that follow:

Name of textfile: **VistorRideLog.txt**
 Format: **VistorName#RideName#NoUsed**

Description of textfile fields:

- VistorName** - Name of a visitor at the waterpark
- RideName** - Name of the ride the visitor used
- NoUsed** - Number of times visitor used this ride

The following linked/parallel arrays have been declared globally:

Name Of Array	Datatype	Size
arrVisitorName	String	30
arrRideName	String	30
arrNoUsed	Integer	30

Complete the questions that follow to extract the stored statistics to produce results the waterpark can use to improve the facilities offered, effectively.

3.1 Button: Import Data (12)

- Connect to the text file, open it for reading and loop through the file.
- Extract each line and process the line, separating the delimited data.
- Store the corresponding name in *arrVisitorName*, the Ride Name in *arrRideName* and the number of times the visitor has used the ride in *arrNoUsed*.
- Display a confirmation message to the user indicating that the data was extracted successfully.

3.2 Button: Display Data (10)

Display all data on **redDisplay** with appropriate headings in the format shown in the sample output:

SAMPLE OUTPUT

Visitor Names	Ride Used	Number of times
1. Sharon Scheffel	Uphill Water Coaster	6
2. Tomiko Loso	Mat Racing Slide	3
3. Lianne Badilla	Surfing Ride	7
4. Jacquelyn Sibley	Launch Chamber Slide	3
5. Lianne Badilla	Launch Chamber Slide	2
6. Toshia Nuno	AquaLoop	7
7. Tracy Coover	Surfing Ride	8
8. Valorie Meyers	Bowl Ride	1
9. Thresa Galipeau	Funnel Ride	5
10. Sharon Scheffel	Uphill Water Coaster	6
11. Sandi Hardaway	Surfing Ride	3
12. William Hassett	Speed Slide	7
13. Tracy Coover	Surfing Ride	3
14. Lianne Badilla	Uphill Water Coaster	6
15. Tracy Coover	Mini-Funnels Ride	8
16. Jeane Foltz	Speed Slide	9
17. Lianne Badilla	Surfing Ride	3
18. Wilson Bahr	Halfpipe Slide	2
19. Lianne Badilla	Uphill Water Coaster	1
20. Addie Segawa	Mini-Funnels Ride	6

3.3 Button: Total Usage

(12)

Calculate and display on **redDisplay** the total number of times this visitor has visited the park.

- a) Allow a user to enter a visitor's name for using a dialog box.
- b) Use this name to search through **arrVisitorName**
- c) Add the number of times this visitor used that ride. This total will indicate the number of times a visitor visited the park.

SAMPLE OUTPUT

Visitor Names	Ride Used	Number of times
1. Sharon Scheffel	Uphill Water Coaster	6
2. Tomiko Loso	Mat Racing Slide	3
3. Lianne Badilla	Surfing Ride	7
4. Jacquelyn Sibley	Launch Chamber Slide	3
5. Lianne Badilla	Launch Chamber Slide	2
6. Toshia Nuno	AquaLoop	7
7. Tracy Coover	Surfing Ride	8
8. Valorie Meyers	Bowl Ride	1
9. Thresa Galipeau	Funnel Ride	5
10. Sharon Scheffel	Uphill Water Coaster	6
11. Sandi Hardaway	Surfing Ride	3
12. William Hassett	Speed Slide	7
13. Tracy Coover	Surfing Ride	3
14. Lianne Badilla	Uphill Water Coaster	6
15. Tracy Coover	Mini-Funnels Ride	8
16. Jeane Foltz	Speed Slide	9
17. Lianne Badilla	Surfing Ride	3
18. Wilson Bahr	Halfpipe Slide	2
19. Lianne Badilla	Uphill Water Coaster	1
20. Addie Segawa	Mini-Funnels Ride	6

SHARON SCHEFFEL visited the park 12 times

3.4 Button: Sort Data

(19)

Display on **redDisplay** all visitors and their statistics sorted in ascending order of visitor names.

Turn Over For Sample Output...

SAMPLE OUTPUT

Visitor Names	Ride Used	Number of times
1. Addie Segawa	Mini-Funnels Ride	6
2. Jacquelyn Sibley	Launch Chamber Slide	3
3. Jeane Foltz	Speed Slide	9
4. Lianne Badilla	Uphill Water Coaster	6
5. Lianne Badilla	Surfing Ride	7
6. Lianne Badilla	Surfing Ride	3
7. Lianne Badilla	Uphill Water Coaster	1
8. Lianne Badilla	Launch Chamber Slide	2
9. Sandi Hardaway	Surfing Ride	3
10. Sharon Scheffel	Uphill Water Coaster	6
11. Sharon Scheffel	Uphill Water Coaster	6
12. Thresa Galipeau	Funnel Ride	5
13. Tomiko Loso	Mat Racing Slide	3
14. Toshia Nuno	AquaLoop	7
15. Tracy Coover	Surfing Ride	8
16. Tracy Coover	Mini-Funnels Ride	8
17. Tracy Coover	Surfing Ride	3
18. Valorie Meyers	Bowl Ride	1
19. William Hassett	Speed Slide	7
20. Wilson Bahr	Halfpipe Slide	2

QUESTION 3 TOTAL: [43]

TOTAL : [130]

I
B
A
R
W
B
R

V
A
R
W
C

image - Pictures. Load from file.