



education

Department:
Education
PROVINCE OF KWAZULU-NATAL

GREENBURY SECONDARY SCHOOL

INFORMATION TECHNOLOGY P1

GRADE 10

JUNE 2016 EXAMINATIONS

Date of examination: 07 /06/2016

MARKS: 150

TIME : 3 HOURS

EXAMINER : M PADAYACHEE

MODERATOR : S NAIDOO

This question paper consists of 9 pages and 3 questions.

INSTRUCTIONS AND INFORMATION

1. This question paper is divided into THREE questions. Candidates must answer ALL THREE questions.
2. The duration of this examination is three hours. 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.
3. Make sure that you answer the questions according to the specifications that are given in each question. Marks will 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, sort 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. Data structures which are not supplied must be defined by you, the programmer.
8. You must save your work regularly on the disk/CD/DVD/flash disk you have been given, or on the disk space allocated to you for this examination session.
9. Make sure that your name appears as a comment in every program that you code, as well as on every event indicated.
10. 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.

SCENARIO

Sharky is an up and coming businessman in the local community. He recently started a small business of issuing loans to people who have been rejected by banks and other loan firms. Due to the poor economic conditions of middle and lower income members of the community, his loan business began to thrive. Now Sharky finds himself so busy that he cannot cope with the paperwork and the record keeping that his business requires.

In the light of this, Sharky requires software to help him manage and run his business. You are required to design software to help Sharky run his company.

Read the problems below and help him design software using the IDE selected to help solve the problems:

QUESTION ONE

1.1. Sharky has a small business selling paint in order to supplement his income to offer loans. He needs a simple program to help him decide exactly how much paint a customer needs to purchase as well as the purchase price.

All he needs from a customer is the dimensions of the walls to be painted as follows:

- > The type of paint required (Indoor or outdoor).
- > The number of walls and the height.
- > The length each wall.
- > The number of coats per wall.

The price of paint comes as:

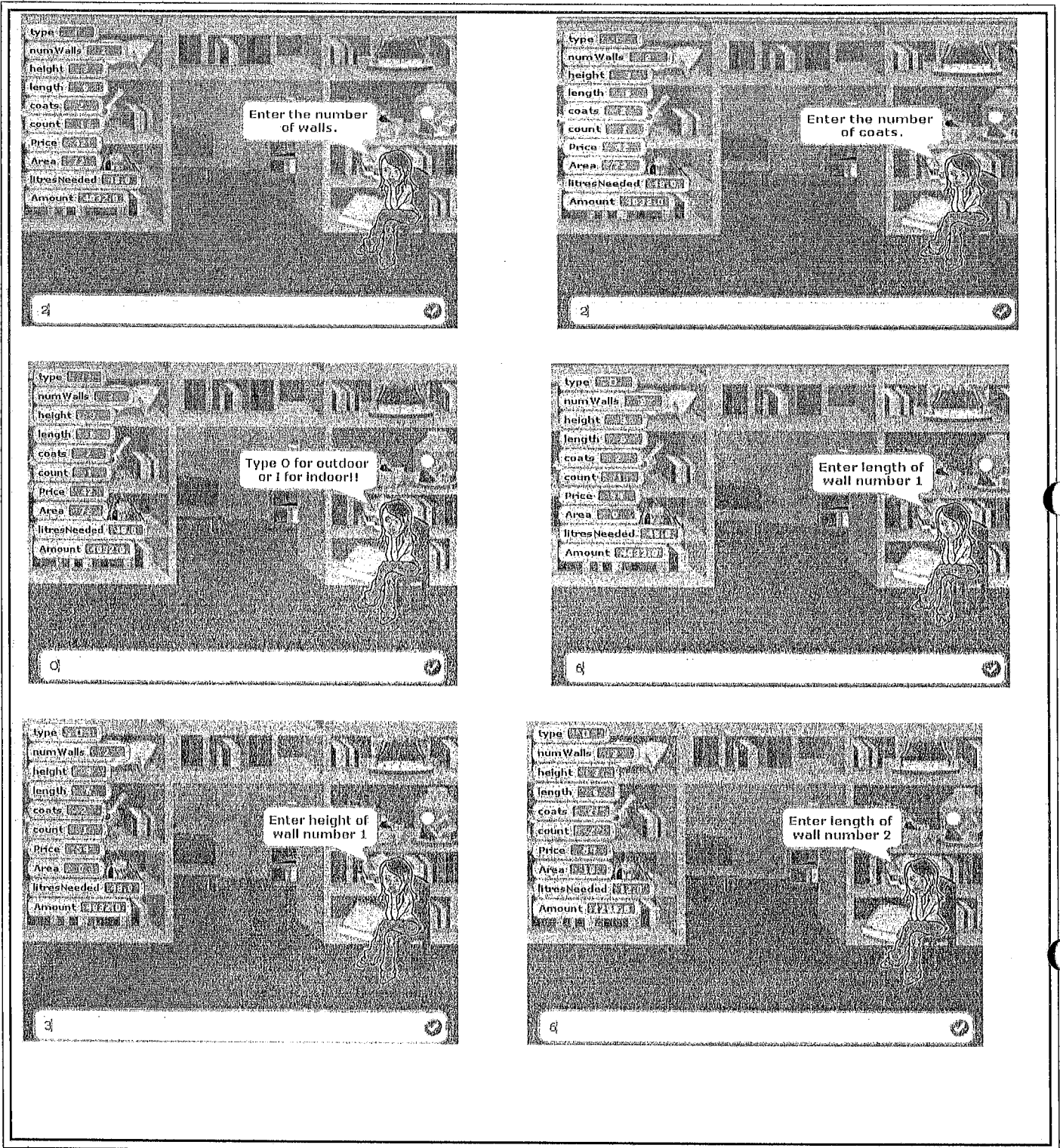
→ Indoor paint costs R42 per litre

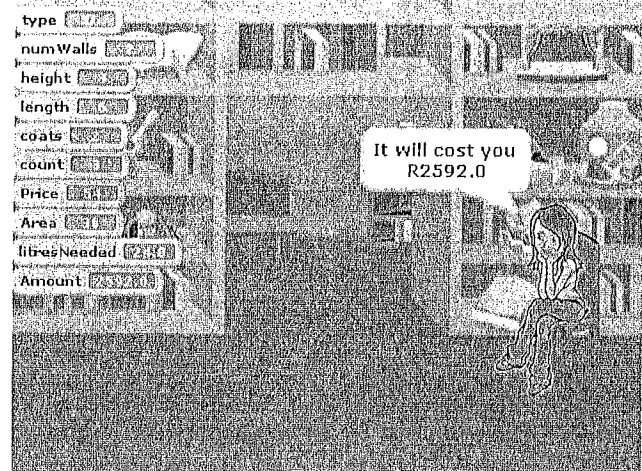
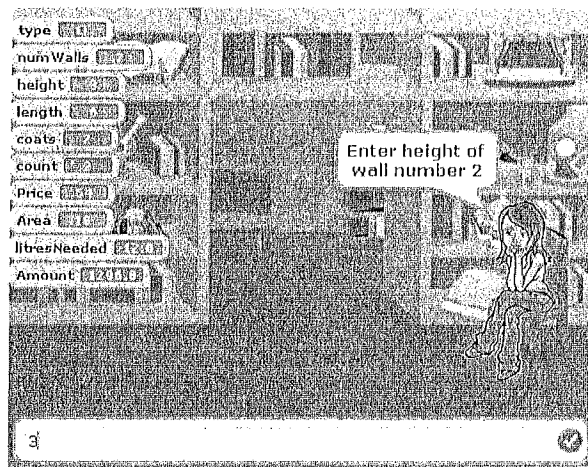
→ Outdoor paint costs R54 per litre

1 litre of paint is said to cover 1.5 square meters. You are required to write a Scratch code in a user friendly way to assist Sharky to make quick decisions. Your script must display the total surface area of the walls. The volume of paint needed in litres and the price of the paint. Save your script as **Q11JunExam_YourName**

(25)

Sample Run





1.2.

In order to manage his business properly, Sharky needs to examine statistics of his company on a monthly basis. He currently has more than 10 clients that have taken major loans.

He uses the data to make predictions and prospective budgets for the months to come. He needs a software to determine the median, highest, lowest etc.

Use the two lists given in **Q12JunExam** to produce the required outputs as shown below:

1.2.1. Write script to program Sprite 1 to prompt the user for the number of clients and input a list of string values that comprises of two main components that is the client name and the amount in the format ClientName, Loan amount. Broadcast to sprite number 2. (7)

1.2.2. Write script for Sprite2 that will create two separate lists. One for the client name and one for the client amounts. These lists must be linked by the index number. Broadcast to Sprite 3. (20)

1.2.3. Program Sprite 3 to sort both lists according to the amount of loan taken. Then broadcast to Sprite 4. (15)

1.2.4. Sprite 4 should be programmed to find and display the median and the average of the loans taken. (13)

TOTAL Q1 = [80]

QUESTION TWO

Sharky has a 30Gig cap on the data used by his office staff for work purposes. Over and above that he pays per Mb of data. His current monthly bill exceeded his normal contract by a sizeable margin. Sharky was not impressed.

This forced him to control how his workers used the internet, especially social media and unnecessary downloading during office hours. So he was advised to create a security password for each of his employees which only he and the individual employee would know. This meant that every time they logged onto the internet, the software would record the password and track data usage.

You are required to design a software using an algorithm that will create a passcode just in case Sharky forgets.

The algorithm below must be used to create the password. You are required to write the corresponding Delphi code for the algorithm. Use the GUI already provided in the file **Q2G10** to answer the questions:

2.1. Firstly you are required to capture all the details necessary to produce the code for the employee. Write the code for question **2.1. WELCOME MESSAGE** panel to obtain the full name(i.e. sur name and then first name) and ID number from the edit text given. Thereafter display a welcome message in the space provided as shown in the output below.

2.1. WELCOME MESSAGE

FULL NAME Pillay Adrian

ID NUMBER 9907126742084|

GENERATE MESSAGE

MESSAGE Hi Adrian.Welcome to Sharkys.

(4)

2.2. This part of the code should assist Sharky to determine the personal details such as age and gender. Write the correct code in the button GENERATE DATA to display the age and gender respectively. Use the data extracted from 2.1.

The gender is determined as follows :

-If the person is a female, then the last two digits extracted, must form a number greater than 10 and the first digit must be greater than the second digit.

2.1. WELCOME MESSAGE

FULL NAME Jonas Ashley

ID NUMBER 9505318105083

GENERATE MESSAGE

MESSAGE Hi Ashley Welcome to Sharkys.

2.2. PERSONAL DATA - FINDER

AGE OF EMPLOYEE 21

GENDER FEMALE

GENERATE DATA

2.1. WELCOME MESSAGE

FULL NAME Jonas Ashley

ID NUMBER 9505318105013

GENERATE MESSAGE

MESSAGE Hi Ashley Welcome to Sharkys.

2.2. PERSONAL DATA - FINDER

AGE OF EMPLOYEE 21

GENDER Male

GENERATE DATA

(15)

2.3. In order to determine the salary that the employee should receive, the user must be prompted for the following information:

→ Enter the rate of pay per hour. E.g 8.30 means R8.30.

→ Enter the number days worked in the week.

→ Enter number of hours worked overtime. Overtime has a rate of time and a half.

This means that the normal hourly rate is multiplied by 1.5.

Every employee has to pay UIF contribution which is 1% of the monthly Gross Salary.

The working hours for the day is 10 hours. Above 10 hours is considered overtime.

Code the button SALARY FINDER to prompt the user for the necessary details as input. Then display it neatly as shown in the example below:

See next page for sample run:

2.3. SALARY STRUCTURE

```
Rate : 13.50
Days per week : 5
Overtime Hrs : 10
Basic Salary : R 2 902.50
Net Salary : R 2 873.47
```

SALARY FINDER

(12)

2.4. Finally generate the code for each employee using the algorithm:

Stage1 - Remove all vowels from the surname entered in 2.1. (all capital letters).

Stage2 - add to that the middle value of the ID number entered in 2.1.

Stage3 - then generate a 2 digit random number between 10 and 100.

Display the details of each employee as well as each stage of the formation of the code as shown below:

2.4. CODE GENERATOR

GENERATE CODE

```
Full Name : Pillay Ronald
ID : 9801026151081
Stage1 : PLLY
Stage2 : PLLY6
Stage3 : PLLY673
```

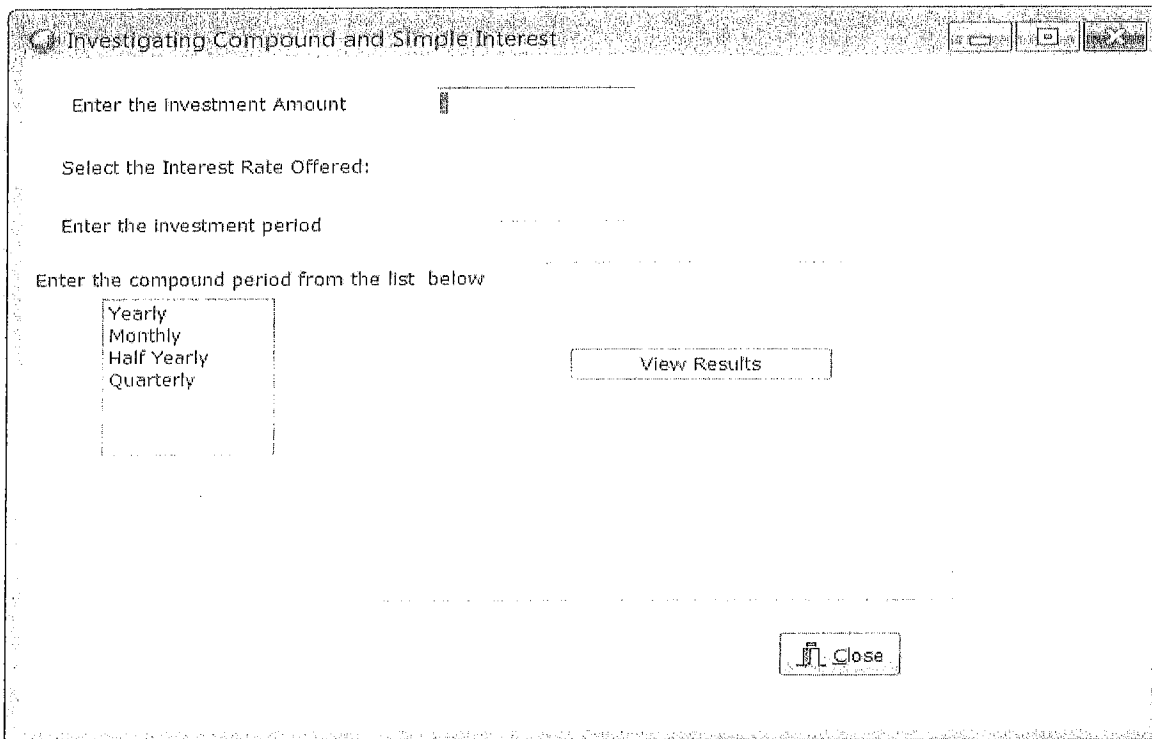
(14)

TOTAL Q2 = [45]

QUESTION THREE

Sharky wishes to adopt the same approach as banks by offering his clients a choice of simple and compound interest. Use the Delphi code already designed. Make the necessary changes by adding code so that the relevant output may be used to assist the client in choosing the right option.

Study the GUI below (this code is given to you in your folder called Jun2016Gr10).



View Results

View Results

COMPOUND INTEREST

$$\text{Final Amount} = p \times (1 + i)^n$$
$$= 1645.31$$

SIMPLE INTEREST

$$\text{Final Amount} = p \times i \times n$$
$$= R 1 500.00$$

TOTAL Q3 = [25]



**JUNE EXAMINATIONS-2016
INFORMATION TECHNOLOGY P1 – GRADE 10**

MARKING MEMORANDUM

QUESTION 1

NO	SOLUTION	COMMENT	MAX MK	MK
1.1	ask "Enter the amount to convert" and wait set "Rands" to (answer) ask "Enter the number of people attending match" and wait set "numPeople" to (answer) ask "Enter the number of days staying" and wait set "numDays" to (answer)	<ul style="list-style-type: none"> Input amount ✓ Input the number of people ✓ Input days staying ✓ 	3	
1.2	set "Pounds" to $((\text{Rands}) / 21.73)$ say (join "You will receive " (join (round (Pounds)) " Pounds")) for 2 secs	<ul style="list-style-type: none"> formula ✓ display ✓ 	3	
1.3	set "ticketCost" to $((\text{numPeople}) * 22)$ set "Discount" to $((\text{ticketCost}) * 0.05)$ say (join "Discount received " (Discount)) for 2 secs set "numFreeTicket" to (round $((\text{numPeople}) / 3)$) say (join "You will receive " (join (numFreeTicket) " free tickets")) for 2 secs set "ticketCost" to $((\text{ticketCost}) - (\text{Discount}))$ say (join "Final ticket price is " (ticketCost)) for 2 secs	<ul style="list-style-type: none"> calculate ticket cost ✓ calculate discount ✓ display discount ✓ calculate number of free tickets ✓ display free tickets ✓ calculate final cost ✓ display final cost ✓ 	8	
1.4	set "startOdo" to (pick random 200 to 650) set "endOdo" to (pick random 1200 to 2500) set "mileage" to $((\text{endOdo}) - (\text{startOdo}))$ say (join "Total mileage is" (mileage)) for 2 secs set "hireCost" to $((\text{numDays}) * 25) + ((\text{mileage}) * 3)$ say (join "Hiring cost is" (hireCost)) for 2 secs	<ul style="list-style-type: none"> randomly generate and store start odometer reading ✓ randomly generate and store end odometer reading ✓ calculate total mileage ✓ calculate hiring cost ✓ display hiring cost ✓ 	6	
1.5	set "Rands" to $(250 * 21.73)$ say (join "You will receive " (join (round (Rands)) "Rands")) for 2 secs if $((\text{hireCost}) < 250)$	<ul style="list-style-type: none"> calculate rand equivalent ✓ display rand equivalent ✓ correct condition in if statement ✓ correct message in if statement ✓ 		

TOTAL FOR QUESTION 1

			5
			25

QUESTION 2

NO	SOLUTION	COMMENT	MAX MRK	MRK
2.1	when green flag clicked ask "Enter number of people in tour group " and wait set "numP" to (answer) set "numSingle" to "0" if $((((\text{numP}) \bmod 2) = "0"))$ then set "numDbI" to $((\text{numP}) / 2)$ else set "numDbI" to $((\text{numP}) - 1) / 2)$ set "numSingle" to "1" say (join "Number of double rooms " (numDbI)) for 2 secs say (join "Number of single rooms " (numSingle)) for 2 secs	<ul style="list-style-type: none"> input number of people ✓ correct condition to check if number in group is even / odd ✓ calculate number of double rooms ✓ calculate number of single rooms ✓ display number of rooms of each type ✓ 	5	
2.2	ask "Enter number of days staying " and wait set "numDays" to (answer) ask "Enter meal option (B,N,BA, BF)" and wait set "mealOpt" to (answer) if $((\text{mealOpt}) = "B\N")$ set "mealCost" to "0" if $((\text{mealOpt}) = "BA")$ set "mealCost" to $((\text{numDays}) * 35)$ if $((\text{mealOpt}) = "BF")$ set "mealCost" to $((\text{numDays}) * 20)$ say (join "Meals cost R" (mealCost)) for 2 sec	<ul style="list-style-type: none"> input number of days ✓ input meal option ✓ use of if statements ✓ to check meal options and assign an appropriate meal cost ✓ value calculate meal cost ✓ display meal cost ✓ 	8	
2.3	set "accCost" to $((\text{numDbI}) * 90) + ((\text{numSingle}) * 75)$ set "accCost" to $((\text{numDays}) * (\text{accCost})) + (\text{mealCost})$ say (join "Total accommodation costs R" (accCost)) for 2 secs	<ul style="list-style-type: none"> calculate accommodation costs ✓ calculate total cost including meals ✓ display total accommodation costs ✓ 	4	

2.4	<pre>set "value" to (pick random 1 to 5) set "star" to "*" repeat ((value) - 1) set "star" to (join (star) "*"*) say (star) for 2 secs end</pre>	<ul style="list-style-type: none"> randomly assign rating value initial value set to * use of loop accumulate stars to variable display stars out of loop 	5	
TOTAL FOR QUESTION 2			22	

QUESTION 3

NO	SOLUTION	COMMENT	MAX MK	MK
3.1	<pre>when green flag clicked set "DOB" to "0" ask "What's your name?" and wait set "first" to (answer) ask "What's your surname?" and wait set "surn" to (answer) set "numChar" to ((length of (surn)) + (length of (first))) if ((numChar) < "10") set "numChar" to (join "0" (numChar)) set "lastDigit" to (letter (length of (first)) of (first)) set "userName" to (join (letter 1 of (surn)) (join (letter 2 of (surn)) (join (numChar) (lastDigit)))) say (userName) for 2 secs</pre>	<ul style="list-style-type: none"> input first name input surname calculate total number of characters in name and surname ensuring total characters exceeds 10 and adding a zero if not determining last letter of first name building user name display user name 	8	
3.2	<pre>repeat until ((length of (DOB)) = "8") ask "Enter date of birth in format ddmmyyy" and wait set "DOB" to (answer) set "yob" to (join (letter 5 of (DOB)) (join (letter 6 of (DOB)) (letter 7 of (DOB)) (letter 8 of (DOB)))) set "age" to (2016 - (yob)) say (join "Age is " (age)) for 2 secs set "MOB" to (join (letter 3 of (DOB)) (letter 4 of (DOB))) if ((MOB) = "6") then say "You qualify for the cruise" for 2 secs else say "You DO NOT qualify for the cruise" for 2 secs end</pre>	<ul style="list-style-type: none"> use of repeat until loop correct validation condition validated input extract the year of birth calculate age of person display age correctly extract the month of birth correct condition in if statement correct message if condition is true correct message if condition is false 	10	
TOTAL FOR QUESTION 3			18	

QUESTION 4

NO	SOLUTION	COMMENT	MAX MK	MK
4.1	<pre>when green flag clicked delete "all" of "cost" delete "all" of "flights"</pre>	<ul style="list-style-type: none"> declare list to store cost declare list to store flights 	2	
4.2	<pre>repeat 6 ask "Enter the name of the flight" and wait add (answer) to "flights" add (pick random 8500 to 12500) to "cost" broadcast "part 1" end</pre>	<ul style="list-style-type: none"> use of loop (run 6 times) input the name of flight and store in flights list randomly generate value in range 8500 to 12500 store this random value in cost list 	4	
4.3	<pre>when I receive "part 1" set "sum" to "0" set "x" to "0" repeat 6 change "x" by 1 set "sum" to ((sum) + (item (x) of "cost")) set "avg" to ((sum) / 6) say (join "The average is " (avg)) for 2 secs broadcast "part 2" end</pre>	<ul style="list-style-type: none"> initialise sum to 0 use of index counter use of loop (6 times) calculate sum of cost list calculate average outside loop display average 	6	
4.4	<pre>when I receive "part 2" set "min" to "1000000" set "x" to "0" repeat 6 change "x" by 1 if ((item (x) of "cost") < (min)) set "min" to (item (x) of "cost") set "y" to (x) say (join "The cheapest flight is " (join (item (y) of "flights") (join " Costing R" (min)))) for 2 sec broadcast "part 3"</pre>	<ul style="list-style-type: none"> initialise minimum value to large value use of index counter use of loop (6 times) correct condition to find lowest value store the lowest flight name / position and flight cost display flight name outside loop 	6	
4.5	<pre>when I receive "part 3" set "x" to "0" set "count" to "0" say "The following flights fares are below average:" for 2 secs repeat 6 change "x" by 1 if ((item (x) of "cost") < (avg)) change "count" by 1 say (join (item (x) of "flights") (join</pre>	<ul style="list-style-type: none"> use of index counter initialise counter to 0 use of loop (run 6 times) check if cost less than average in loop increment counter display flight name and cost in loop display the number of flights less than the average in loop 	7	

	<pre> " (item (x) of "cost"))) for 2 secs say (join "Number of flights " (count)) for 2 secs broadcast "part 4" end </pre>				
4.6	<pre> when I receive "part 4" ask "Enter the flight number " and wait set "num" to (answer) say (join "Name of flight " (item (num) of "flights"))) for 2 secs say (join "Cost of flight R" (item (num) of "cost"))) for 2 secs set "tax" to ((item (num) of "cost") * 0.17) say (join "Airport Tax R" (tax)) for 2 secs set "totalCost" to ((tax) + (item (num) of "cost")) say (join "Total Flight Cost R" (totalCost)) for 2 secs broadcast "part 5" end </pre>	<ul style="list-style-type: none"> input flight number✓ display flight name✓ display the flight cost✓ calculation of tax✓ display tax✓ calculate total cost✓ display total cost✓ 	7		
4.7	<pre> when I receive "part 5" set "temp" to (item 1 of "cost") replace item 1 of "cost" with (item 2 of "cost") replace item 2 of "cost" with (temp) say "Values swapped!" for 2 secs broadcast "end" end </pre>	<ul style="list-style-type: none"> use of temporary variable to store first value✓ swap first value with second value✓ swap second value with temp variable✓ 	3		
TOTAL FOR QUESTION 4				35	

TOTAL = 100

MEMO GRADE 10 - JUNE P1

QUESTION 1

```

when green flag clicked
ask "Enter the amount you wish to convert" and wait
set "Rands" to (answer)
ask "Enter the number of people attending soccer match" and
wait
set "numPeople" to (answer)
set "numDays" to (answer)
set "Pounds" to ((Rands) / 21.73)
say (join "You will receive " (join (round (Pounds)) "
Pounds")) for 2 secs
set "ticketCost" to ((numPeople) * 22)
set "Discount" to ((ticketCost) * 0.05)
say (join "Discount received " (Discount)) for 2 secs
set "numFreeTicket" to (round ((numPeople) / 3))
say (join "You will receive " (join (numFreeTicket) " free
tickets")) for 2 secs
set "ticketCost" to ((ticketCost) - (Discount))
say (join "Final ticket price is " (ticketCost)) for 2 secs
set "startodo" to (pick random 200 to 650)
set "endodo" to (pick random 1200 to 2500)
set "mileage" to ((endodo) - (startodo))
say (join "Total mileage is" (mileage)) for 2 secs
set "hireCost" to ((numDays) * 25) + (mileage) * 3))
say (join "Hiring cost is" (hireCost)) for 2 secs
set "Rands" to (250 * 21.73)
say (join "You will receive " (join (round (Rands)) "Rand"))
for 2 secs
if (hireCost) < "250") else
say "You will be able to cover hire costs" for 2 secs
else
say "You will NOT be able to cover hire costs" for 2
secs
stop script
end-----

```

QUESTION 2

```

when green flag clicked
ask "Enter number of people in tour group " and wait
set "numP" to (answer)
set "numSingle" to "0"
if (((numP) mod 2) = "0") else
set "numDb1" to ((numP) / 2)
else
set "numDb1" to (((numP) - 1) / 2)
set "numSingle" to "1"
say (join "Number of double rooms " (numDb1)) for 2 secs

```

```

say (join "Number of single rooms " (numSingle)) for 2 secs
ask "Enter number of days staying " and wait
set "numDays" to (answer)
ask "Enter meal option (BN, BA, BF) " and wait
set "mealOpt" to (answer)
if (mealOpt) = "BN")
set "mealCost" to "0"
if (mealOpt) = "BA")
set "mealCost" to ((numDays) * 35)
if (mealOpt) = "BF")
set "mealCost" to ((numDays) * 20)
say (join "Meals cost R" (mealCost)) for 2 secs
set "accCost" to ((numDb1) * 90) + (numSingle) * 75))
set "accCost" to ((numDays) * (accCost)) + (mealCost))
say (join "Total accommodation costs R" (accCost)) for 2 secs
set "star" to "*"
repeat ((value) - 1)
set "star" to (join (star) "**")
say (star) for 2 secs
end-----

```

QUESTION 3

```

when green flag clicked
set "DOB" to "0"
ask "What's your name?" and wait
set "firstN" to (answer)
ask "What's your surname?" and wait
set "surN" to (answer)
set "numChar" to ((length of (surN)) + (length of (firstN)))
if (numChar) < "10")
set "numChar" to (join "0" (numChar))
set "lastDigit" to (letter (length of (firstN)) of (firstN))
set "userName" to (join (letter 1 of (surN)) (join (letter
of (surN)) (join (numChar) (lastDigit))))
say (userName) for 2 secs
repeat until ((length of (DOB)) = "8")
ask "Enter date of birth in format ddmmyyy" and wait
set "DOB" to (answer)
set "yob" to (join (letter 5 of (DOB)) (join (join (letter 6
of (DOB)) (letter 7 of (DOB)) (letter 8 of (DOB))))
set "age" to (2016 - (yob))
say (join "Age is " (age)) for 2 secs
set "MOB" to (join (letter 3 of (DOB)) (letter 4 of (DOB)))
if (MOB) = "6") else
say "You qualify for the cruise" for 2 secs
else
say "You DO NOT qualify for the cruise" for 2 secs
end-----

```

QUESTION 4

```

when green flag clicked
  delete "all" of "cost"
  delete "all" of "flights"
  repeat 6
    ask "Enter the name of the flight " and wait
    add (answer) to "flights"
    add (pick random 8500 to 12500) to "cost"
  broadcast "part 1"
end

when I receive "part 1"
  set "sum" to "0"
  set "x" to "0"
  repeat 6
    change "x" by 1
    set "sum" to ((sum) + (item (x) of "cost" ))
    set "avg" to ((sum) / 6)
  say (join "The average is " (avg)) for 2 secs
  broadcast "part2"
end

when I receive "part2"
  set "min" to "100000"
  set "x" to "0"
  repeat 6
    change "x" by 1
    if ((item (x) of "cost" ) < (min))
      set "min" to (item (x) of "cost" )
      set "y" to (x)
    say (join "The cheapest flight is " (join (item (y) of
"flights" ) (join " Costing R" (min)))) for 2 sec
  broadcast "part3"
end

when I receive "part3"
  set "x" to "0"
  set "count" to "0"
  say "The following flights fares are below average : " for 2
secs
  repeat 6
    change "x" by 1
    if ((item (x) of "cost" ) < (avg))
      change "count" by 1
      say (join (item (x) of "flights" ) (join " " (item
(x) of "cost" ))) for 2 secs
    say (join "Number of flights " (count)) for 2 secs
  broadcast "part 4"
end

when I receive "part 4"
  ask "Enter the flight number " and wait
  set "num" to (answer)

```

```

2 secs
say (join "Name of flight " (item (num) of "flights" )) for
secs
say (join "Cost of flight R" (item (num) of "cost" )) for 2
set "tax" to ((item (num) of "cost" ) * 0.17)
say (join "Airport Tax R" (tax)) for 2 secs
set "totalCost" to ((tax) + (item (num) of "cost" ))
say (join "Total Flight Cost R" (totalCost)) for 2 secs
broadcast "part 5"
end

```

```

when I receive "part 5"
  set "temp" to (item 1 of "cost" )
  replace item 1 of "cost" with (item 2 of "cost" )
  replace item 2 of "cost" with (temp)
  say "Values swapped !" for 2 secs
  broadcast "end"
end

```

```

when I receive "part 5"
  set "temp" to (item 1 of "cost" )
  replace item 1 of "cost" with (item 2 of "cost" )
  replace item 2 of "cost" with (temp)
  say "Values swapped !" for 2 secs
  broadcast "end"
end

```

