ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Advanced Level

SOFTWARE ENGINEERING 6044/2

PAPER 2 Practical

SPECIMEN PAPER 3 hours

Additional materials:
Answer paper
CD

TIME 3 hours

INSTRUCTIONS TO CANDIDATES

Answer **all** questions in Section A and any **three** in Section B.

All answers should be printed. Handwritten answers will not be marked.
This is a purely practical paper.
Each answer sheet should include the following information in the header.

- Candidate name
- Candidate number and centre number
- Subject code

All work should be backed up by a soft copy on a CD.
If you print more than one sheet, fasten them together.
For each programming question, indicate the language used.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [ ] at the end of each question or part question.

You are reminded of the need for good English and clear presentation in your answers.

This question paper consists of 5 printed pages and 3 blank pages.

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[Turn over

Section A (40 marks)

Answer **all** questions in this section.

1. **(a)** Using a word processing application write a psudocode which enters a password. It should allow a maximum of three entry chances. [5]

(b) Dry-run the algorithm to show the results for :

(i) correct password first attempt; [1]

(ii) wrong password first attempt; [2]

(iii) three wrong attempts. [2]

Save and print the document

2. Using suitable design tool or application software of your choice draw a flow chart to show how you would sort a list of 10 numbers using bubble sort.
Print and save the document. [10]

3. A supermarket needs to develop an online shopping software to capture customer details and product inventory. The customer will supply personal details on each purchase. The system will generate a customer reference number. A sales clerk will generate sales details daily based on the daily purchases. A weekly sales report is supplied to the manager.

(a) With the aid of software design tools illustrate the above scenario using a context diagram.
Save and print the document. [10]

(b) Use your answer in **(a)** to develop a level one data flow diagram, highlighting validation and verification process.
Save and print the document. [10]

Section B (60 marks)

Answer any **three** questions in this section

4. A prime number is a number that cannot be divided by other numbers other than itself, and1. Examples are 2,3,5,7,11,13 and 17.
Using a programming language of your choice, design an interface and write a program which can test whether a number entered by the user is a prime number or not.
Save your work.

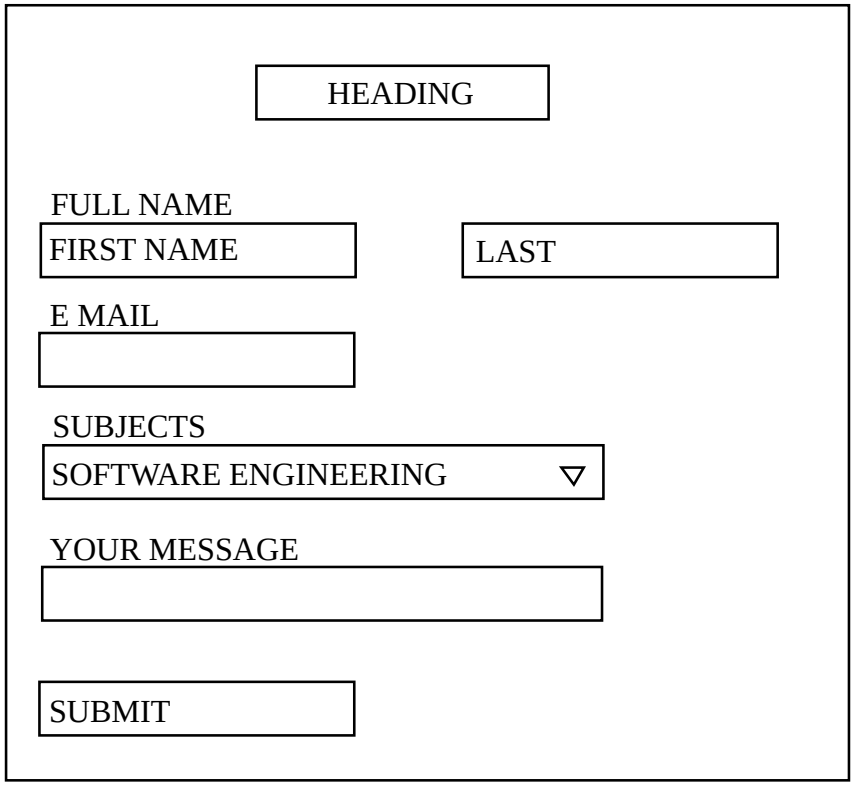
(a) Print your interface showing results for

(i) 15, [5]

(ii) 31. [5]

(b) Print the source code. [10]

5. The following is an online form used to capture details of learners who have interest in applying for a scholarship.



Develop a program for this design using a web based application.
Save and print the interface and source code. [20]

6. A school wishes to develop a database to store student details and records. The tables below show data to be stored.

Student Details

NAME	SURNAME	STD	SUBJECT	AGE	CLASS
MOSES	JOHNS	4321	HUMANITY	17	5A
TONDERAI	JAMES	4392	SCIENCE	19	5B
MONICA	MARIRA	4933	SCIENCE	17	5A
MARIA	SADZA	4322	PRACTICAL	18	5C
JAMES	JOHNS	4320	HUMANITY	20	6B

Parent Details

NAME	SURNAME	PARENT ID	STDID	PROFF	GENDER
AMOS	SADZA	14398	4322	TEACHER	MALE
MOSES	JOHNS	14698	4320	DOCTOR	MALE
MONICA	JAMES	14699	4392	TEACHER	FEMALE
MOLLY	MARIRA	14793	4933	NURSE	FEMALE
MOSES	JOHNS	14698	4321	DOCTOR	MALE

Using a database application of your choice

(a) **(i)** Create a database. [3]

(ii) Create a table with student details and a table with parent details. Print the design structure of the student details table showing length of field
key field. [2]

(b) Produce a list of students who are in the same class and are of the same age. Save and print the list as “student list”. [2]

(c) Create a report on the names ID and class of the learners who do sciences whose parents are teachers.

(i) Produce a print screen showing the search criteria. [2]

(ii) Save and print the report as “teachers – child”. [1]

(iii) Provide the print screen showing the relationship between the two tables. [1]

(d) Normalise the parents details table up to 2nd normal form.
Show all the normalisation stages.
Print . [4]

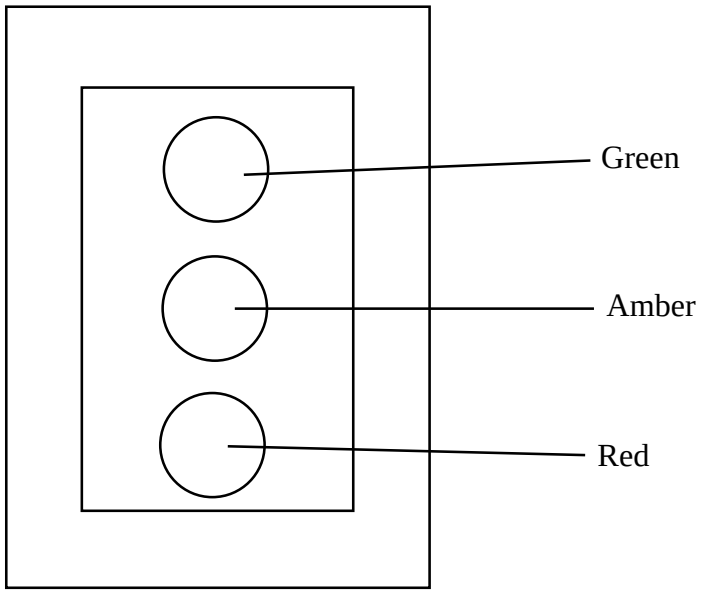
(e) Using a web application of your choice.

(i) Create an interface to allow a user to make entries for student details.
Print. [2]

(ii) Link the database to the application in **(i)** and show the steps followed. Print the document. [3]

7. Below is a form showing traffic lights.

Traffic light



Write a program to simulate traffic lights. Set your time at 2 seconds.

(a) Print the interface with the amber light enables [6]

(b) Save and print the source code. [14]

8. The Body Mass Index or (BMI) of a person is based on the body weight and height. BMI is calculated using the formula weight /(height)^2 where weight is measured in kilogrammes and height in metres.

(a) Using a function design an interface and write a program to calculate the BMI of a person. Use a programming language of your choice.
Save and print the source code. [BMI = w/h^2] [12]

(b) Print an interface showing BMI for weight of 70kg and height of 1,5 m. [8]

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