TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF BUSINESS

UNIVERSITY EXAMINATION FOR:

BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

SPECIAL SUPPLEMENTARY

EIT 4102: FUNDAMENTALS OF PROGRAMMING

PAPER - B

SERIES: SEPT 2017

TIME: 2 HOURS

DATE:

<u>**Instructions to Candidates**</u>
You should have the following for this examination
   -Answer Booklet, examination pass and student ID
This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.
Do not write on the question paper.

SECTION A (30 MARKS) - COMPULSORY

Question One

a) Explain the following terms as used in programming:
   i). Array; **(1 Mark)**
   ii). Function; **(1 Mark)**
   iii). Flowchart**; (1 Mark)**
   iv). Structure. **(1 Mark)**
b) Briefly state some of the reasons why C has now become a widely used professional language **(4 Marks)**

c) Define the term identifier and give the rules that we use when defining an identifier in C. **(3 Marks)**

d) Draw a flowchart for a program that will allow a user to enter a student's exam mark. If the student's mark is below 50, it should output "FAIL", if the student's mark is 50 and above, it should output

"PASS"
                (4 Marks)

e) Re-write the program below using the switch statement.

> *#include<stdio.h>*
> *void main(){ int choice=0;*
> *printf("Enter Option as 1,2,3 or 4::");*
> *scanf("%d",&choice);*
> *if (choice ==1){*
> *printf("You selected BUS");*
> *}*
> *if (choice ==2){*
> *printf("You selected TRAIN");*
> *}*
> *if (choice==3){*
> *printf("You selected AIRPLANE");*
> *}*
> *if (choice==4){*
> *printf("You selected SHIP");*
> *}*
> *}*   **(4 Marks)**

f) Write a program in C language that will allow you to enter the age of ten students in an array named *studage* through keyboard. Using for loop structure the program should output the average age of all students. **(6 Marks)**

g) Define a structure called book_bank with the following individual member elements: author, title, no of pages, ISBN, price, publisher and country of publication. Assign some initial values. **(5 Marks)**

SECTION B (40 MARKS) – ANSWER ANY TWO QUESTIONS

Question Two

a) In the year 2014 travel fares for bus and taxi cab were as follow:

	Less than 50 km	51-150 km	151-400km	Over 401km
Bus	50	80	200	800
Taxi	100	400	800	3000

At the start of the year 2015 the cost of oil in the international market has fall to close to half the previous year's cost per gallon and as a result, the cost of travel fare for different modes of transport were revised as follows.

Bus fare 10% decrease for distance over 50km, 40% decrease for distance over 150km, 25% decrease for distance over 400km .Taxi fare decrease 25% for distance over 150km and 30% for distance over 400km

Required:

Write a program in C language that will allow user to check the current transport fare for both bus and tax. It should provide user with a menu for selecting either Bus or Taxi then prompt the user to enter distance he/she wishes to travel. The program should calculate and output the new revised travel fare for the journey from the old fare shown in the table. Use both **switch** and **if..elseif** decision structures.

(10 Marks)

b) Giving examples, distinguish between variable declaration and variable assignment   **(4 Marks)**

c) State four data types that are supported by C programming environment and their memory usage.

(4 Marks)

d) Distinguish between local variables and global variables as used is programming   **(2 Marks)**

Question Three

a) Describe two logical operators used in C programming.   **(4 Marks)**
b) Explain the purpose of the following file type specifications:

     i).   w

     ii).   r+

     iii).   a+

     iv).   r   **(4 Marks)**

c) An infinite loop structure is a variant of the indefinite loop structure. With the aid of an example explain this fact. **(3 Marks)**

d) Write a program that will compute the sum of the following series:

$$S = \frac{1}{2} + \frac{2}{3} + \frac{3}{4} + \frac{4}{5} + \ldots + \frac{99}{100}$$

(7 Marks)

e) What is term used to refer to the ampersand symbol (&) used in the scanf function? Give. Why is the ampersand symbol used in the scanf function. **(2 Marks)**

Question Four

a) Outline what constitutes a simple C program. Then give the C program syntax for a simple program.

(5 Marks)

f) State the purpose of each of the following format specifiers used in scanf:

   i). %c

   ii). %f

   iii). %d

   iv). %s **(4 Marks)**

b) The program below is supposed to output the greatest value of the two numbers initialized by variable num1 and num2.

```
#include <stdio.h>
main()
{
int greatest, num1=50, num2=15;
greatest=greaterValue(number1, number2);
printf("The greater integer is %d\n",greatest);
}
```

Given that the function greaterValue() is missing from the program above, complete the program.

(6 Marks)

c) Explain the term "comment" as used in programming, giving the general syntax for each of the two forms of a comment in C. **(3 Marks)**

d) Define the term "*recursive function*" as used in programming. **(2 Marks)**

Question Five

CHINA WU-YI Construction Company has 500 casual workers in Thika Superhighway contract categorized A B and C. The company computes their wage in the following manner. A worker in category "A" gets sh.900 per day if he/she has worked for 25 days and sh.750 per day if he had worked for less than 25 days. A worker in category "B" gets sh.600 per day if he/she has worked for 25 days and sh.450 per day if he had worked for less than 25 days. A worker in category "C" gets sh.200 per day if he/she has worked for 25 days and sh.100 per day if he/she has worked for less than 25 days. In order to motivate workers, if any of them had worked for more

than 25 days, apart from the specified wages for the first 25 days an additional pay of sh.1500, sh.1200 and sh.900 is paid to workers of category A, B and C respectively for each additional day.

Required:

(a.)   Generate the flowchart for the problem.   **(10 Marks)**

(b.)   Translate your flowchart into a source code using a C Programming Language.   **(10 Marks)**