

TECHNICAL UNIVERSITY OF KENYA
FACULTY OF APPLIED SCIENCES AND TECHNOLOGY
SCHOOL OF COMPUTING & INFORMATION TECHNOLOGY
END OF SEMESTER DECEMBER 2016 EXAMINATION SERIES
FIRST SEMESTER EXAMINATIONS 2016/2017
FIRST YEAR EXAMINATIONS FOR THE DEGREE OF
BACHELOR OF TECHNOLOGY IN COMPUTER TECHNOLOGY
BACHELOR OF TECHNOLOGY IN INFORMATION TECHNOLOGY
BACHELOR OF TECHNOLOGY IN COMMUNICATIONS AND COMPUTER
NETWORKS

**ECSI 1104 / ECII 1104 / ECCI 1104 : PRINCIPLES OF
PROGRAMMING**

TIME: 2 Hours December
2016

Instructions to candidates:

This paper consists of FIVE Questions.

Answer Question ONE [30 Marks] and any other TWO Questions [20 Marks Each].

Write your college number on the answer sheet.

This paper consists of 3 printed pages

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

QUESTION ONE [30 MARKS] COMPULSORY

- a) Explain the following terms as used in programming, giving an example of each:-
[3 mark]
- (i). Logical error
 - (ii) Low level language
 - (iii) Language translators
- b) (i) Differentiate between a file and a record. [4 Marks]
- (ii) Using a flowchart, Design a program to evaluate the area of a circle using the formula :- $\text{Area} = \text{pie} \times r^2$, given that pie = 3.14 [5 Marks]
- (iii) Write a program in Pascal language to find the area of a circle. [5 Marks]
- c) Describe the structured programming paradigm. [3 marks]
- d) A program is required to determine the age group of a person, given that a person age group is child if he/she is below 15 year, and youth when older than child and below 30 years otherwise he/she is an adult.
- (i) Using a pseudo code Design a program that solves the problem given. [5 Marks]
 - (ii) Draw a flowchart that translates the solution written in pseudo code in Q1d(i). [5 Marks]

QUESTION TWO [20 MARKS]

- a) (i) Define the term algorithm as applied in computer programming. [2 marks]
- (ii) Explain two program design tools used to represent an algorithm. [2 Marks]
- (iii) illustrate each of the two program design tools in Q2(a-ii) in solving a problem to generate the values in the following series:
 $X = \{0, 3, 6, 9, \dots, n\}$. (use loop control structure where applicable). [4 Marks]
- b) Using customer details name[35 characters] , pin number[20 digits], age[3 digits], and Gender [1 character]:-
- i. Explain three simple data types used in Pascal program and write a declaration. [4

Marks] ii. Explain the various sections in the Pascal declaration.
[3

Marks]

c) Explain three control structures used in constructing a program.
[3

Marks]

d) Explain any Two programming tools used during program development. [2 Marks]

QUESTION THREE [20 MARKS]

- a) Outline the role of a compiler in programming. [3 marks]
- b) Describe the three principles used in structured programming paradigm. [6 marks]
- c) Draw a flowchart that allows the user to input data comprising of: First name [15 characters], Registration no [5 digits], fees [10 digits to 2 decimal places] for 10 students and then displays the list of 10 students' details. [5 Marks]
- d) Explain three strategies used in system changeover. [6

Marks]

QUESTION FOUR [20 MARKS]

- a) Explain the first Six phases in system development life cycle. [6 Marks]
- b) Differentiate between sorting and searching. [4 Marks]
- c) Write a Pascal program that prompts the user to input a list of 50 customer salary and search for the customer with lowest salary in the list for output. [6 Marks]
- d) Using a flowchart, illustrate the searching process for the customer with lowest salary in Q4(d). [4 Marks].

QUESTION FIVE [20 MARKS]

- a) Explain three types of programming errors, giving an illustration for each. [6

Marks]

- b) Differentiate between the following terms as applied in programming:-
- i. Procedure and function
 - ii. Formal parameter and Actual parameter

[4 Marks]

- c) Explain three benefits of subprograms in a program.
[3

Marks]

- d) Using a user defined function, write a program in Pascal Language that calculates the square of a number and returns to main program for output.

[7 Marks]