



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN ELECTRICAL AND ELECTRONICS

ENGINEERING

SMA 2175: PROGRAMMING I

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

DATE: Pick Date Apr 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of Choose No questions. Attempt Choose instruction.

Do not write on the question paper.

Question ONE

- Write a C program that converts a character from lowercase to uppercase (4 marks)
- Explain the if else control structure and write a C program to illustrate it (8 marks)
- Define the following terms (6 marks)
 - Arrays
 - Functions
 - Pointers
- Briefly explain how to compile a C program (4 marks)
- In details describe the permissible styles of comments in the C programming language (4 marks)
- By using functions in your C programs, you can practice structured programming, What is structured programming and what are its advantages (4marks)

Question TWO

- a) Use an algorithm (e.g. flow chart) to represent the flow control structure determined by the “if” statement. (6 marks)
- (
- b) Differentiate between void main () and int main() (4 marks)
- c) Explain the following terms as used in programming (8 marks)
- Compiler
 - Bug
 - Data Types
 - Algorithms

Question THREE

- a) Write a C program to illustrate the use of each of the following operators (10 marks)
- The assignment operator
 - Mathematical operators
 - Relational operators
 - Logical operators
- b) Describe the format of a C program (10 marks)

Question FOUR

- a) By using a flow diagram, show how a while loop construction works. (6 marks)
- b) What guidelines should you follow in creating names for variables and constants (8 marks)
- c) Define a Pseudocode and explain how it is used as a problem solving tool (6 marks)

Question FIVE

- a) Using a program example explain the difference between While and Do-While loop statements (10 marks)
- b) What is the difference between puts() and printf () (4 marks)
- c) What's the difference between an integer variable and a floating-point variable (6 marks)



TECHNICAL UNIVERSITY OF MOMBASA
INSTITUTE OF COMPUTING AND INFORMATICS

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN MEDICAL ENGINEERING

EIT 4331: SOFTWARE APPLICATION

END OF SEMESTER EXAMINATION

SERIES: AUGUST2017

TIME:2HOURS

DATE:3Sep2017

Instructions to Candidates

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.

Question ONE

- a.) Differentiate the following in relation to MATLAB date representation:
- i. Date String (3 marks)
 - ii. Date Vector (3 marks)
 - iii. Serial Date Number (3 marks)
- b.) MATLAB offers three types of logical operators and functions; explain the following operators:

- i. Element-wise (2 marks)
 - ii. Bit wise (2 marks)
 - iii. Short circuit (2 marks)
- c.) Arithmetic in MATLAB follows all the usual rules and uses the standard computer symbols for its arithmetic operation signs. Discuss the arithmetic operations with the appropriate symbols. (5 marks)
- d.) Variable names are an example of identifier names. What are the rules for naming variables in MATLAB. (5 marks)
- e.) Explain the steps for loading and saving data in MATLAB. (5 marks)

Question TWO

- a.) MATLAB provides extensive documentation in both printed and online format to help you learn about and use all its features. The MATLAB documentation is organized into main topics. Discuss the main topics organized in MATLAB. (12 marks)
- b.) The best way for you to get started with MATLAB is to learn how to handle matrices. You can enter matrices into MATLAB in several different ways; explain the four common ways of entering matrices. (4 marks)
- c.) Like most other programming languages, MATLAB provides mathematical expressions but unlike most programming languages these expressions involve entire matrices. What are the building blocks of this expressions? (4 marks)

Question THREE

- a.) MATLAB provides four functions that generate basic matrices. Explain these four functions. (8 marks)
- b.) Define the term Concatenation. (3 marks)
- c.) MATLAB offers several types of functions to use in your programming. Discuss the following types of functions:
 - i. Anonymous Functions (3 marks)
 - ii. Private Functions (3 marks)
 - iii. Nested Functions (3 marks)

Question FOUR

- a.) There are two basic ways to create graphs in MATLAB: Discuss the two possible ways. (9 marks)
- b.) Plotting tools are attached to figures and create an environment for creating graphs. What are some of the uses of these tools? (5marks)
- c.) Explain the following three components of the plotting tools:
- i. Figure Palette (2 marks)
 - ii. Plot Browser (2 marks)
 - iii. Property Editor (2 marks)

Question FIVE

- a.) Using a program example explain the difference between While and Do-While loop statements in MATLAB. (8 marks)
- b.) Explain the if else control structure and write a MATLAB form to illustrate it. (8 marks)
- c.) Explain the role of variables and assignment operator in storing values in MATLAB. (4 marks)



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN MARINE ENGINEERING

EMR 2215: ICT IV

END OF SEMESTER EXAMINATION

SERIES: APRIL 2017

TIME: 2 HOURS

DATE: 30 Sep 2017

Instructions to Candidates

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.

Question ONE (COMPULSORY)

- a) Describe the basic structure of a c ++ programming language **(5marks)**

- b) Differentiate between each of the following terms giving examples of how they are used
 - i. cin and cout statements **(2marks)**

 - ii. Logical and assignment statement **(2marks)**

- c) Differentiate between the 2 c++ comments giving example of how each is **used** **(4marks)**

- d) define each of the following terms **(3marks)**
 - i. Milestone
 - ii. Dependencies
 - iii. Deliverables

- e) State and describe the importance of Work breakdown structure (WBS) **(4marks)**

Question TWO

- a) Define the following terms giving examples of how each is used; **(3marks)**
- i. Identifiers
 - ii. Variables
 - iii. string
- b) Give any three examples of datatypes **(3marks)**
- c) Point out the difference between a local and a global variable **(4marks)**
- d) Write a source code for a function called max(). The function takes two parameters num1 and num2 and returns the maximum between the two **(4marks)**
- e) Write a simple do while loop statement that would produce each of the following output
- i. 16, 15, 14, 13, 12, 11, 10 **(3marks)**
 - ii. 1, 2, 3, 4, 5, 6, 7 **(3marks)**

Question THREE

- a) State and illustrate any two activity sequencing methods used to represent sequencing leading to the end of a project **(6marks)**
- b) Identify any four main tools used for schedule development of a project **(4marks)**
- c) Describe the five main inputs required in controlling the schedule process of a project **(10marks)**

Question FOUR

- i. Explain the five main stages involved in project breakdown **(10marks)**
- ii. Identify the five main steps involved in structuring project management human resources **(10marks)**

Question FIVE

Describe the distinguishing features of each of the following marine scientific packages

i. Finite Element Analysis Common FEA Applications **(10marks)**

ii. Computational Fluid Dynamics (CFD) **(10marks)**



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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN ELECTRICAL AND ELECTRONICS

ENGINEERING

SMA 2175: PROGRAMMING I

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

DATE: Pick Date Apr 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of Choose No questions. Attempt Choose instruction.

Do not write on the question paper.

Question ONE

- a) Write a C program that converts a character from lowercase to uppercase (4 marks)
- b) Explain the if else control structure and write a C program to illustrate it (8 marks)
- c) Define the following terms (6 marks)
 - Arrays
 - Functions
 - Pointers
- d) Briefly explain how to compile a C program (4 marks)
- e) In details describe the permissible styles of comments in the C programming language (4 marks)
- f) By using functions in your C programs, you can practice structured programming, What is structured programming and what are its advantages (4marks)

Question TWO

- a) Using a program describe the format of a C program (4 marks)
- b) Define the following terms (6 marks)
- Arrays
 - Functions
 - Pointers
- c) Differentiate between void main () and int main() (4marks)
- d) Explain the guidelines one should you follow in creating names for variables and constants (6 marks)

Question THREE

- a) Write a C program to illustrate the use of each of the following operators (10 marks)
- The assignment operator
 - Mathematical operators
 - Relational operators
 - Logical operators

Describe the format of a C program
(8 marks)

Question FOUR

- a) What are the advantages of high level languages over machine language? (4 Marks)
- b) By using a flow diagram and a program, show how a while loop construction works. (10 marks)
- c) Define a Pseudocode and explain how it is used as a problem solving tool (6 marks)

Question FIVE

- a) Using a program example explain the difference between While and Do-While loop statements (10 marks)
- b) What is the difference between puts() and printf () (4 marks)
- c) What's the difference between an integer variable and a floating-point variable (6 marks)



TECHNICAL UNIVERSITY OF MOMBASA

Institute of Computing & Informatics

UNIVERSITY EXAMINATION FOR:

BTIT/SEP 2014Y2S2, BSIT/SEP 2014/J-FT Y2S1, BMCS 14S Y2S2,

BFSQ 15S/ BTMB 15S

**EIT 4150/ EIT 4152 INTRODUCTION TO INFORMATION
TECHNOLOGY/ INFORMATION TECHNOLOGY I**

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

Paper 1

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of Five questions. Attempt Question One and any two other

Do not write on the question paper.

Question 1 (30 marks)

a). Bits n' Pieces limited is a company that sells consumer electronics. The company has sales personnel operating in major towns in Kenya. Until now, whenever a sales person wants to make an inquiry about availability of stock or to find the detailed specification of a product, they have to make a telephone call to the head office so that the products can be searched and information relayed over the phone. This causes delays for sales people when they have many responses to deal with. Additionally, the sales people would like to make decisions about the stock items that should be reordered, and also to make projections of anticipated sales from marketing campaigns that they carry out so as to try and meet sales targets while staying within budget. The sales people on the ground would thus like to interact with the head office databases directly and require both software and hardware to enable this. The IT department wants to set up an automated system that will allow sales people to carry out their inquiry and analysis activities. This project will be rolled out to all sales people scattered country wide. You have been asked to recommend the type of hardware and software that could be used in this setup:

i. Recommend at least three pieces of hardware that could be used in this setup giving a reason

- for each. [6Marks]
- ii. Suggest two types of information systems that could be used to enable the service to run effectively. [4 Marks]
- iii. Propose four information system resources that should be present in order for the whole setup to function effectively giving examples for each and state how each integrates into the system. [16Marks]
- b). Increased uses of social networking forums such as face book and chat rooms have clear benefits and disadvantages. State two benefits and two limitations of these forums [4 marks]

Question 2 (20 marks)

a)A multinational organization has offered to donate computers to your organisation. The Board of Governors has requested you to advice on the operating system to be used by providing answers to the following questions.

- i. What is an operating system? [2 mark]
- ii. State and briefly explain any **two** types of operating systems. [4 marks]
- iii. Briefly explain any **three** functions of an operating system. [6 marks]
- b) A member of the board has heard of windows file systems.
- i) Define windows file system. [2marks]
- ii) Bring out clearly the two types of file systems supported by windows and recommend with supporting facts the best the organisation can adopt. [6marks]

Question Three (20 marks)

- a). i). Define the term directory [2marks]
- b). Briefly explain how files are generally organized in a Windows operating system. [2marks]
- c). Bit rate and bandwidth tell us about the speed of data communication. What is the relationship between bit rate and bandwidth? [4 marks]
- b) An example of a Universal Resource locator (URL) is <http://www.tum.edu> What do the terms http and www mean? [4 marks]
- c) What type of application software is required to access the World Wide Web? [2 mark]

d) Using a relevant example, illustrate the benefits of accessing the world-wide web (www) to the student community in a university? [4 marks]

e) The formula = K20 + P\$18 was typed in cell L21 and then copied to cell M24 of a spreadsheet. Write the formula as it appears in cell M24. [2 marks]

Question Four (20 marks)

a) Differentiate between a database and a database management system. [4marks]

b) Describe the general organization of a relational database. [2marks]

c) A client has requested the list of users who have accessed a confidential file. State the type of file that would contain the required information? [2marks]

d) A closed-question survey has been developed to obtain feedback from 3000 customers whose details are in a company database. Suggest and justify the most efficient method of conducting the survey. [4marks]

d) i) List TWO maintenance procedures that may be undertaken on a hard disk drive. [2marks]

ii) Describe the basic operations of the utilities you suggest in question d) i) above. [2 marks]

e) Give two reasons that manufacturers have for providing updates to their software? [2marks]

f) Explain any two text editing features in a word processor [2marks]

Question Five (20 marks)

a) Illustrate the functional components of the CPU clear showing the flow of program instructions, flow of control and flow of data signals [6 marks]

b) Give **three** advantages of a computerised database system [3 marks]

c) The first column in the table below contains the formulae as stored into the cell F10 of a spreadsheet. Enter the formulae as they would appear when copied to cell M20 of the same spreadsheet. [3marks]

Formula in F10	Formula in M20
= D10*E10	
= A\$25	
= \$D\$13	

d) A company wishes to update its current paper-based user documentation to online

documentation. Provide advice to the management regarding the benefits to the company of online documentation. [4marks]

e) Explain the following terms:

i) Firmware

iii) Utility programs

[4marks]



TECHNICAL UNIVERSITY OF MOMBASA

Institute of Computing & Informatics

UNIVERSITY EXAMINATION FOR:

BTIT/SEP 2014Y2S2, BSIT/SEP 2014/J-FT Y2S1, BMCS 14S Y2S2,

BFSQ 15S/ BTMB 15S

**EIT 4150/ EIT 4152 INTRODUCTION TO INFORMATION
TECHNOLOGY/ INFORMATION TECHNOLOGY I**

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

Paper 2

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of Five questions. Attempt Question One and any two other

Do not write on the question paper.

Question One (30 Marks)

a) A 5-year-old laptop with a recently formatted hard drive needs to have an operating system installed.

i) Define an operating system [2marks]

ii) Discuss five function of an operating system. [10marks]

iii) Describe TWO factors about the laptop's hardware that would influence the choice of an operating system. [4marks]

iv) A decision has been made to undertake a FULL installation of the operating system software. What are the consequences of this decision for the laptop and its users? In your answer consider other more suitable installation options. [4marks]

b) List and explain any three windows systems tools. [6marks]

c) Discuss any four factors one should consider when purchasing a computer [4marks]

Question Two (20 Marks)

a) A logo is to be added to the top of every page of a large document. Which option should be selected to best achieve this? [2marks]

b) A confidential file needs to be deleted from a workstation. Explain the most effective way to achieve this. [2marks]

c) A company has a large number of computers, varying in type and age. Discuss the most cost-effective commercial licensing option for this company? [2marks]

d) What is a relational database? [2 marks]

e) The spreadsheet extract is used to calculate wages for John’s Computing Supplies company.

	A	B	C
1	Jo’s Computing Supplies – Wages Sheet		
2			
3	Employee	Hours worked	Wage
4	J. Lee	10	=B4* $\$B10
5	B. Su	20	
6	A. Jones	30	
7			
8	Total hours	=Sum(B4:B6)	=Sum(C4:C6)
9			
10	Hourly Rate	\$4.60	
11			

- i. The value of hours worked for J. Lee is increased from ‘10’ to ‘15’. Identify, using cell references, other cells in which values will change as a result of this increase. [2marks]
- ii. The formula in cell C4 is copied into cell C6. Write the formula that would now appear in cell C6. [2marks]
- iii. Jo uses a word processor to write a report on the wages paid to the employees. Describe the processes required to create and incorporate a graph into the report. [5marks]

- f) Justify any three criteria to be considered when recommending vendors and software. [3marks]

Question Three 20 Marks

a) Kilifi county council is in the process of outsourcing for a database system to manage its community development projects. As a community development officer provide insights on the following issues.

- i) Two softwares that can be used to develop such a system [2marks]
- ii) Explain the purpose of data validation in a database [3 marks]
- iii) Provide examples of **THREE** types of validation checks [6 marks]
- iv) Indicate the limitation of such checks [2marks]

f) Explain four reasons why an organisation should move away from manual type writing and adopt an electronic word processor [4marks]

g) Justify why some instructions are held in the ROM [3marks]

Question Four (20 Marks)

a) Andrew, Jane, David and Zablon had tea, sausages and bananas for breakfast. They took one sausage, two sausages, three sausages and one sausage respectively. In addition, they each took a cup of tea and two bananas. Tea, sausages and bananas cost Ksh. 10, 15, and 5 respectively. By naming columns A, B, C, and rows 1, 2, 3

- (a) Construct a worksheet showing the above information. [6 marks]
- (b) state the expression you would use to obtain:
 - (i) Total expenditure by David. [4 marks]
 - (ii) Total number of sausages taken. [2 marks]
 - (iii) The cost of the cheapest item. [2 marks]
 - (iv) What is a relational database? [2 marks]

b) Bit rate and bandwidth tell us about the speed of data communication. What is the relationship between bit rate and bandwidth? [4 marks]

Question Five (20 marks)

a) Discuss the classification of computers according to generations and highlight the technology that was used in each generation. [8marks]

b) Illustrate the functional components of the CPU clear showing the flow of program instructions, flow of control and flow of data signals [6 marks]

c) Using a relevant example, illustrate the benefits of accessing the world-wide web (www) to the student community in a university? [4 marks]

d) Differentiate between system software and application software. [2marks]



TECHNICAL UNIVERSITY OF MOMBASA
INSTITUTE OF COMPUTING AND INFORMATICS

UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN information technology
BIT 2319: ARTIFICIAL INTELLIGENCE

END OF SEMESTER EXAMINATION (PAPER 2)

SERIES: AUGUST2017

TIME: 2HOURS

DATE: Pick Date Select Month Pick Year

Instructions to Candidates

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.

Question 1

- a) Outline the tasks that artificial intelligence is designed to achieve (5 marks)
- b) Illustrate the areas of AI and some dependencies (5 marks)
- C) Briefly describe the Turing Test. (4 marks)
- d) Differentiate between artificial and intelligence (4 marks)
- e) Explain the term Search in artificial intelligence (2 marks)
- f) Explain the fact that the space complexity of depth first search is much better compared to breath breadth first search (4 marks)
- g) Explain the three main differences between searching algorithm and a planning algorithm (4 marks)

h) What are the two components of the decision making apparatus of a logical AI agent?
(2 marks)

Question Two

Artificial intelligence has found a lot of use in business organizations. Discuss the use of AI in the following areas.

i) The web (4 marks)

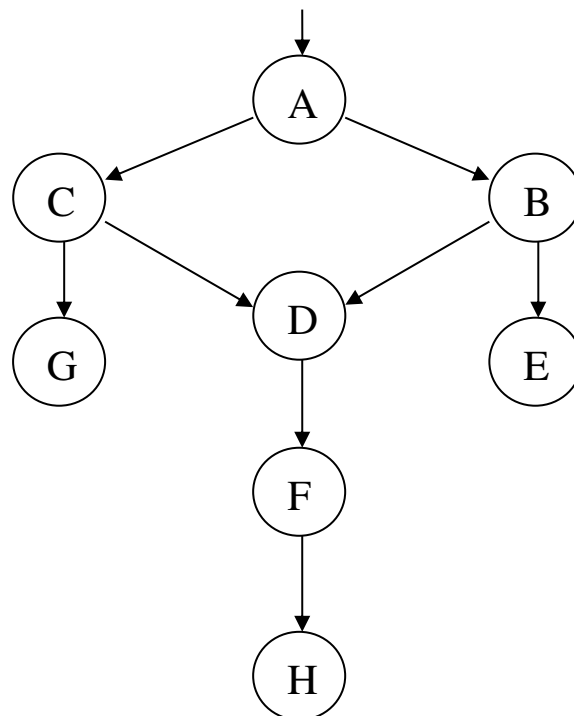
ii) In finance (4 marks)

iii) In e-commerce (4 marks)

iv) In medical applications (4 marks)

v) In education (4 marks)

Question Three



a) Consider the following graph.
Starting from state A, execute DFS. The goal node is G. Show the order in which the nodes are expanded. Assume that the alphabetically smaller node is expanded first to break ties.
(10 marks)

b) Suppose you have the following search space as given in the table:

State	next	cost
A	B	4
A	C	1
B	D	3
B	E	8
C	C	0
C	D	2
C	F	6
D	C	2
D	E	4
E	G	2
F	G	8

- i) Draw the state space of this problem. (4marks)
- ii) Assume that the initial state is A and the goal state is G. Show how each of the following search strategies would create a search tree to find a path from the initial state to the goal state using:
- a) Breath first search (3marks)
- b) Iterative deepening search (3marks)

Question Four

- a) Define the following terms as used in expert systems
- i) System (2 marks)
- ii) Expert (2 marks)
- iii) Expert system (2 marks)
- b) Draw the structure of an expert system and explain the different components (10 marks)
- c) State four benefits of expert systems (4 marks)

Question Five

a) Explain the following terms:

i) Supervised learning (2 marks)

ii) Reinforcement learning (2 marks)

iii) Unsupervised learning (2 marks)

b) Discuss the application of machine learning (6 marks)

c) i) Explain the term neural networks (2 marks)

ii) With a suitable diagram, explain how the human brain works (3 marks)

iii) Describe with the aid of a diagram the working of an artificial neuron (3 marks)



TECHNICAL UNIVERSITY OF MOMBASA

Institute of Computing & Informatics

UNIVERSITY EXAMINATION FOR:

BTIT/SEP 2014Y2S2, BSIT/SEP 2014/J-FT Y2S1, BMCS 14S Y2S2,

BSSC 14S Y2S2

ICS 2105/EIT 4213 DATA STRUCTURES & ALGORITHMS

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

Paper 2

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of Five questions. Attempt Question One and any two other

Do not write on the question paper.

Question 1

- (a) Define the following terms. (4marks)
- (i) Data structures;
 - (ii) Encapsulation
 - (iii) Queue
 - (iv) Abstract Data Type (ADT)
- (b) A good programmer must be able to conceptualize a problem. This he can put down as an algorithm. Algorithms can be expressed in terms of pseudo code or Flowcharts
- (i) List any four properties of an algorithm (4marks)
 - (ii) Why is analysis of algorithms important? (2 marks)
 - (iii) What is the difference between a recursion and iteration in program development? use a high level language examples to make your point clear (4 marks)

(iv) What is the Big Oh Notation? (2marks)

(c) (i) Name one disadvantage of Binary Tree Data structure? (2 marks)

(ii) List any two conditions that should be satisfied when an array type is appropriate for representing an abstract data type. (2 mark)

(d) Searching algorithms are used to read a particular record from a collection of records, write algorithms to demonstrate the following searching techniques.

(i) Selection sort algorithm (4marks)

(ii) Bubble sort (4marks)

(iii) State the most efficient of the two algorithms, justify your answer. (2marks)

QUESTION 2

a) Define an array data structure. [2marks]

b) Justify why one should implement a List over an array ADT. [2marks]

c) An array contains the following items

{45, 76, 57, 25, 89, 21, 15, 22}

Using a high level language ,Write a program that contains the following features;

- i. Initialize an array called *numbers* with the values given above [2 marks]
- ii. Uses a loop to print all the elements in the array the array [6marks]
- iii. Write a statement that prints only the first element in the array. [2marks]
- iv. Write a statement that declares a multi-dimensional array structure called *Ali* of 3 by 5 elements of type *int*. [2marks]
- v. Give a statement that refers to the 6th element in array *Ali*: [2marks]
- vi. Give a statement that passes the value of the 5th element of *Ali* to a variable called *K* [2marks]

QUESTION 3.

a) Define the following terms. Where necessary draw a diagram to illustrate your answer. [8 marks]

- i. Binary tree
- ii. Balanced binary tree
- iii. A binary search tree
- iv. Depth of a tree

b) Given the following numbers:

34 52 9 2 84 6 38 94 65 83

- i. Create a binary search tree using the given numbers [4 marks]

- ii. Give the result of traversing the tree you have created in *i* above using the *post-order*, *in-order*, and *pre-order* traversal methods.

[6 marks]

c) List any Two applications for the tree data structure?

[2marks]

QUESTION 4.

a) Give two properties that a linear list must adhere to

[2 marks]

b) Write an algorithm that explains a linear list insertion.

[8marks]

c) Write an algorithm that explains the Pop & Push operations in a Stack

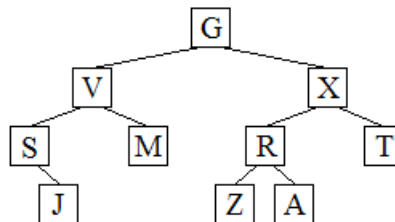
[8 marks]

d) With an illustration differentiate between a doubly linked list and a Circular list

[2marks]

Question Five

- (a) List the order in which the contents of the following tree would be visited, for each of the given traversals:



(i) Preorder

(ii) In order

(iii) Post order

[9marks]

- (b) Consider the following code segment

```
Arr [4] = {6,4,3,1}
```

```
j = 0 , k = 10
```

```
While (j < 4) do
```

```
  If (arr [j] < k) then
```

```
    k =arr [j]
```

```
  Endif
```

```
  j = j+1
```

```
End while
```

```
Display k.
```

- (i) What does the code display, dry run to show your answer

[5marks]

- (ii) Using a high level language, Implement the algorithm in to a program

[4marks]

- (c) Explain Djiksatras algorithm.

[2marks]



TECHNICAL UNIVERSITY OF MOMBASA

Institute of Computing & Informatics

UNIVERSITY EXAMINATION FOR:

BTIT/SEP 2014Y2S2, BSIT/SEP 2014/J-FT Y2S1, BMCS 14S Y2S2,

BSSC 14S Y2S2

ICS 2105/EIT 4213 DATA STRUCTURES & ALGORITHMS

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

Paper 1

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of Five questions. Attempt Question One and any two other

Do not write on the question paper.

Question One

- (a.) (i.) You are employed by a software company designing an application for use by produce wholesalers. Your job is to implement the data structure used to store the inventory of the warehouse containing the produce. The data structure must be able to add a product with an associated code indicating its likelihood to spoil, remove a product that is most likely to spoil (to ship it from the warehouse), and return the overall number of products in the inventory.

Discuss your ADT of choice and its implementation.

[5marks]

- (b.) (i.) Define the term algorithm.

[2mars]

- (ii.) In your own experience in today life where do you think you apply the concept of algorithms? Discuss with an example.

[4 marks]

- (c.) (i.) Differentiate between a recursion and an iteration in program development. Use a high level language example to explain the difference. [6marks]
- (d.) (i.) What do the terms time efficiency and space efficiency mean with reference to an algorithm? [6marks]
- (ii.) State any other three parameters of concern when it comes to measuring time efficiency? [3 marks]
- (iii.) Give the asymptotic growth rate of $S(n)$, the number of steps required by the following code segment. [4marks]
- ```

sum=0;
for(i=0; i < n; i++){
 j=i;
 while(j !=0){
 if(j % 2 == 0)
 sum++;
 j /= 2;
 }
}

```

### **Question Two**

- (a.) (i.) What is a linked list? Explain. [2marks]
- (ii.) Outline the properties of the linked list abstract data type. [4marks]
- (iii.) Write an algorithm used to delete an element from the list [6marks]
- (b.) (i) Write a pseudo code algorithm that prompts the user for three integers , evaluates the largest and print's the maximum [4 marks]
- (ii) Implement the algorithm above into a program using a high level language. [4 marks]

### **Question Three**

- (a.) (i.) Define a stack ADT. [2marks]
- (ii.) Write an algorithm that demonstrates the Push and Pop stack fundamental operations [8marks]
- (iii.) Briefly explain any two applications of stack in computer science [4 marks]
- (b.) (i.) Define the term Abstract Data Type (ADT) and hence give its properties. [6marks]

### **Question Four.**

- (a.) The merge sort algorithm is stated as follows:

If we are required to sort an array, we can divide the array into two sub-arrays of about equal length, sort each sub-array separately, and finally merge the two sub-arrays.

Write a method that accepts an unsorted integer array and uses the above algorithm to sort the array. (10 marks)

(b.) The basic operation of the insertion sort is the insertion of a single element into a sequence of sorted elements so that the resulting sequence is still sorted. The process is illustrated below for an array of five integers. The original array is shown in (i.)

(i.) 

|     |    |     |     |     |
|-----|----|-----|-----|-----|
| 235 | 45 | 182 | 205 | 390 |
|-----|----|-----|-----|-----|

(ii.) 

|    |     |     |     |     |
|----|-----|-----|-----|-----|
| 45 | 235 | 182 | 205 | 390 |
|----|-----|-----|-----|-----|

(iii.) 

|    |     |     |     |     |
|----|-----|-----|-----|-----|
| 45 | 182 | 235 | 205 | 390 |
|----|-----|-----|-----|-----|

(iv.) 

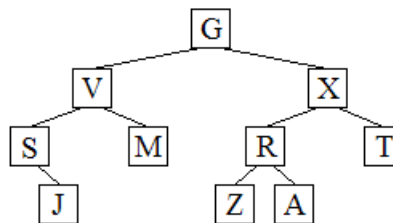
|    |     |     |     |     |
|----|-----|-----|-----|-----|
| 45 | 182 | 205 | 235 | 390 |
|----|-----|-----|-----|-----|

Write a method that accepts as a parameter an array of integers and uses this algorithm to sort the elements in the array.

(10 marks)

**Question Five**

(a) List the order in which the contents of the following tree would be visited, for each of the given traversals:



- (i) Preorder
- (ii) In order
- (iii) Post order

[9marks]

(b) Consider the following code segment

Arr [4] = {6,4,3,1}

j = 0 , k = 10

While (j < 4) do

If (arr [j] < k) then

k =arr [j]

Endif

$j = j+1$

End while

Display k.

- (i) What does the code display, dry run to show your answer [5marks]
- (ii) Using a high level language, Implement the algorithm in to a program [4marks]
- (c) What are the limitations of arrays?. Explain how you can overcome the limitations [2marks]



## TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY  
DEPARTMENT OF BUILDING & CIVIL ENGINEERING

### UNIVERSITY EXAMINATION FOR:

DIPLOMA IN BUILDING AND CIVIL ENGINEERING

EBC 2202 : THEORY OF STRUCTURES I

SPECIAL SUPPLEMENTARY EXAMINATION

**SERIES: JULY 2017**

**TIME: 2 HOURS**

**DATE:** Pick Date Sep 2017

#### Instructions to Candidates

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

*- Pocket calculator*

This paper consists of **FIVE** questions. Attempt any **THREE** questions.

**Do not write on the question paper.**

**Mobile phones are not allowed in the examination room.**

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#### QUESTION ONE

- (a) (i) Define a strut.
- (ii) Outline **three** assumptions in the Euler's column theory. **(4 marks)**
- (b) A hollow alloy tube 4m long with external and internal diameter of 40 and 25 mm respectively was found to extend 4.8 mm under a tensile load of 60 KN. Find the buckling load for the tube with both ends pinned. Also find the safe load on the tube, taking the factor of safety as 5.

**(10 marks)**

- (c) A copper wire of 2mm diameter is required to be wound around a drum. Find the minimum radius of the drum if the stress in the wire is not to exceed 80 Mpa. Take modulus of elasticity for the copper as 100Gpa. **(6 marks)**

### QUESTION TWO

- (a) A steel rod 10m long and of 50mm diameter is used as a column, with one end fixed and the other free. Determine the crippling load by Euler's formula. Take E as  $205 \times 10^3 \text{ n/mm}^2$ . **(5 marks)**
- (b) A hollow rectangular masonry pier is 1.2m x 0.8m wide and 150mm thick. A vertical load of 2MN is transmitted in the vertical plane bisecting 1.2m wide and at an eccentricity of 100mm from the geometric axis of the section. Calculate the maximum and minimum stress intensities in the section. **(15 marks)**

### QUESTION THREE

- (a) For columns with both ends hinged, show that the critical load 'P' is given by the formula

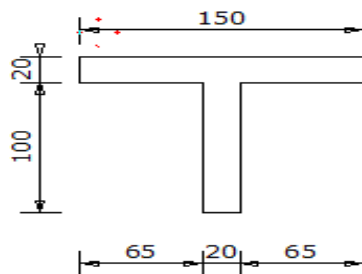
$$P = \frac{\pi^2 EI}{L^2} \quad \text{(15 marks)}$$

- (b) A metallic rod of 10mm diameter is bent into a circular form of radius 6m. If the maximum bending stress developed in the rod is  $125 \text{ n/mm}^2$ , find the value of Young's modulus for the rod material. **(5 marks)**

### QUESTION FOUR

A T-section 150mmx120mmx20mm a shown in figure 1 is used as a strut of 4m long with hinges at its both ends. Calculate the crippling load, if Young's modulus for the material is to be 200Gpa.

**(20 marks)**



**Fig.1**

### QUESTION FIVE

- (a) Find the Euler's crippling load for a hollow cylindrical steel column of 38mm external diameter and 2.5mm thick. Take length of the column as 2.3 m and hinged at its both ends. Take  $E=205\text{Gpa}$ . Also determine crippling load by Rankine's formula using constants as 335Mpa and  $\frac{1}{7500}$ . **(10 marks)**
- (b) An I-section joist 400mmx200mmx20mm and 6m long is used as a strut with both ends fixed. Find the Euler's crippling load for the column? Take Young's modulus for the joist as 200Gpa. **(20 marks)**



# TECHNICAL UNIVERSITY OF MOMBASA

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Institute of Computing & Informatics

## UNIVERSITY EXAMINATION FOR:

BSIT/SEP 2012/J-FT Y4S2

BIT 2319 ARTICIAL INTELLIGENCE **Paper 2**

END OF SEMESTER EXAMINATION

**SERIES:** APRIL 2016

**TIME: 2 HOURS**

### Instructions to Candidates

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

**This paper consists of Five questions. Attempt Question One and any two other**

**Do not write on the question paper.**

### Question ONE

a) Discuss any four critical success factors for the successful implementation of expert systems (4marks)

b) Demonstrate your understanding on the significance of A.I as an enabler to the realization of the Government of Kenya Vision 2030 millennium goals. (8 mark)

(c) With a suitable example differentiate between forward chaining and backward chaining rule based inference control. (6marks)-

(d) Define the term knowledge representation and show how rules qualify to be a knowledge representation formalism. Discuss one advantage of using rules as a representation formalism. (6 marks)

f) i) Discuss the term pattern recognition [2marks]

ii) Drug trafficking is a worldwide problem. Lately, Kenya has been described to be hub for this activity. Hard drug users in Mombasa are also said to be on the increase. Imagine you are a drug enforcement officer at the Moi international Airport. Describe how you would apply pattern recognition in your professional work. (4 marks)

### Question TWO



(a) Discuss any two reasons why psychology may be regarded as a foundation of Artificial Intelligence. State two other foundations of Artificial Intelligence. (4 marks)

(b) (i) Discuss one advantage and one disadvantage of exhaustive search as a problem solving technique. (2 marks)

(ii) Show how a search problem may be specified. (3 marks)

(iii) Describe the best-first search. Explain why you would recommend such a search method. (4 marks)

(iv) State any two real life applications of the search technique. (2 marks)

(c) Describe predicate calculus as knowledge representation formalisms. State one advantage and one limitation of the knowledge representation formalism. (5 marks)

### Question THREE

(a) What is knowledge acquisition? (2 marks)

(b) You have been selected to be part of a team that is assigned the task of developing a knowledge based system. Describe the phases your team must undertake in the process of acquiring knowledge for your system. (10 marks)

(c) Use an outline diagram to describe the structure of the main parts of an expert system. (8 marks)

### Question FOUR

(a) Discuss why agents in Artificial Intelligence need not only be software entities. (3 marks)

(b) Describe statistical classification technique. (2 marks)

(c) Translate the following into predicate calculus (first order logic) using the predicates provided. (5 marks each)

“Every person is loved by some other person”

Predicates: Person(x) loves(x,y)

(d) List and explain any four characteristics used to evaluate a search state strategy (8marks)

(e) What is a heuristic function in a search algorithm? (2marks)

### Question FIVE

Imagine you are a knowledge engineer developing an expert system for animal identification. The expert system is to be used as a learning aid in primary schools. The system should ask

questions concerning the animal, such as appearance, behaviour, habitat, and so on, and then attempt to identify the animal in question.

(a) Give examples of how you would represent knowledge about 2 possible animals in the system, for example

(I) cows, and

(II) pigeons

in the knowledge base, using

(i) rules,

[4 marks]

(ii) frames,

[4 marks]

(iii) networks.

[4 marks]

b) Suppose you have the following search space:

| State | next | cost |
|-------|------|------|
| A     | B    | 4    |
| A     | C    | 1    |
| B     | D    | 3    |
| B     | E    | 8    |
| C     | C    | 0    |
| C     | D    | 2    |
| C     | F    | 6    |
| D     | C    | 2    |
| D     | E    | 4    |
| E     | G    | 2    |
| F     | G    | 8    |

i. Draw the state space of this problem.

(4marks)

ii. Show at each step what nodes are in the queue for the Breath-First-Search. Show the list of nodes that are expanded. Required use a table for analysis (4marks)



# TECHNICAL UNIVERSITY OF MOMBASA

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Institute of Computing & Informatics

## UNIVERSITY EXAMINATION FOR:

BSIT/SEP 2012/J-FT Y4S2

BIT 2319 ARTIFICIAL INTELLIGENCE Paper 1

END OF SEMESTER EXAMINATION

**SERIES:** APRIL 2016

**TIME: 2 HOURS**

### Instructions to Candidates

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

**This paper consists of Five questions. Attempt Question One and any two other**

**Do not write on the question paper.**

**Answer Question 1 and any other two questions.**

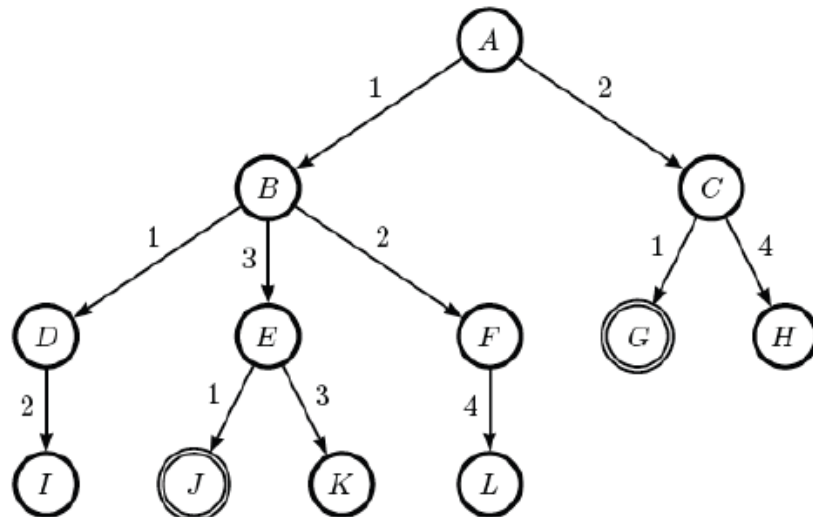
### QUESTION ONE

- a) With suitable examples differentiate between forward and backward chaining rule inference. [6marks]
- b) What is the Turing test and what is it supposed to prove. [4marks]
- c) Briefly describe iterative deepening search, and describe how it attempts to get the best performance features of both breadth-first and depth-first. [4marks]
- d) What is the fundamental difference between informed search algorithm and uninformed search algorithm? [4marks]
- e) Describe briefly the four basic components of a learning AI agent, and their roles. [2marks]
- f) Briefly explain how artificial intelligence can be used in telecommunication and industry [6marks]
- g) List and discuss any two factors that determine the behaviour and performance of intelligent agent. [4marks]

### QUESTION TWO

- a) Demonstrate how Breadth-First-Search and Depth-First-Search can be implemented using some appropriate pseudo-code. [8 marks]

b) The following is a search tree for some state space. Arc labels denote costs, double circles indicate goal nodes.



For each of the following search strategies, indicate the order in which nodes will be chosen and expanded up to the first found goal node.

- i) Breadth first search; [2marks]
- ii) Depth First search; [2marks]
- iii) Iterative deepening search. [2marks]
- iv) Has the cost associated with the arcs influenced the above expansions? [2marks]
- v) Describe the terms complete and optimal with regards to evaluating search strategies. Are either Breadth-First-Search or Depth-First-Search complete? Is either of them optimal discuss. [4marks]

### QUESTION THREE

a) At the top Floor of a building there are three couples (husband and wife). The stairway is not accessible, the building can only be evacuated through the elevator. The elevator can only carry up to three persons, and has to be operated by at least one person. Husbands do not accept that their wives go in the elevator with other men, if they are not present.

How can the building be evacuated without provoking jealousy crisis? Formulate the problem as a search problem.

- (i) Describe the states, the initial state and the final state; [3marks]
  - (ii) Describe the operators and the conditions for their applicability; [3marks]
  - (iii) Describe the states that can be reached from the initial state by means of a single application of an operator; [4marks]
  - (iv) Show a solution path and the operators used to generate it. [3marks]
- b) Discuss giving examples of the four views of A.I [4marks]
- c) What are the **three** principal differences between a *searching algorithm* and a *planning algorithm*? [3marks]

### QUESTION FOUR

a). Translate into predicate logic:

i) *All birds that are not penguins fly*”. [2marks]

ii) *Every child has exactly two parents.*” [2marks]

b) Falcons and eagles are birds. All birds have wings, feathers and a beak. In particular eagles have light feathers and long beaks. Birds fly and use aerodynamic principles. Gliding is a principle used by eagles. Planes also fly, have wings and use aerodynamic principles. A plane has an engine and a pilot. An engine uses petrol. A Boeing 747 is a plane.

i) Construct a semantic network to represent the information. [4marks]

ii) Construct a frame to represent the information. [4marks]

c) Alice, Bob, Camilla and Dan are making plans for spring break. They go to the travel agency, but there are only 2 tickets left. Alice will only go if Bob goes too. Dan will only go if Camilla goes too. Bob has found out that he has to work on the AI project, so he cannot go.

i).Using 4 literals, write the propositional logic formulas corresponding to this text[4marks]

ii).Alice will go only if Bob goes: [2marks]

iii).Dan goes only if Camilla goes: [2marks]

### **QUESTION FIVE**

(a) What is knowledge acquisition? (2 marks)

(b) Describe the knowledge acquisition process. (3 marks)

(c) State any two problems with knowledge acquisition. (2 marks)

(d) Use an outline diagram to describe the structure of the main parts of an expert system. (3 marks)

(e) State two conditions that must hold for an expert systems implementation project to succeed. (2 marks)

f) Demonstrate your understanding on the significance of A.I as an enabler to the realization of the Government of Kenya Vision 2030 millennium goals. (8 mark)



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**TECHNICAL UNIVERSITY OF MOMBASA**  
**INSTITUTE OF COMPUTING AND INFORMATICS**

**UNIVERSITY EXAMINATION FOR:**  
**BACHELOR OF TECHNOLOGY IN INFORMATION**  
**TECHNOLOGY**  
**EIT 4310: ADVANCED WEB PROGRAMMING**  
**SPECIAL SUPPLEMENTARY EXAMINATION (PAPER II)**

**SERIES: SEPT. 2017**

**TIME: 2HOURS**

**DATE SEPT. 2017**

**Instructions to Candidates**

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.**

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**Question ONE (30 Marks)**

- a. Write short programs to illustrate the following tasks that JavaScript can perform [6 marks]
- i) Changing HTML Content
  - ii) Changing HTML Attributes
  - iii) Changing HTML Styles (CSS)
- b. State five characteristics of PHP variables (5 marks)
- c. Outline the common usage of PHP (4 marks)
- d. Identify errors and make appropriate corrections on the subprograms given (5 marks)
- i) `<!DOCTYPE html>`

```
<html>
<body>
<p id="demo"></p>
<script>
function myFunction() {
document.getElementById("demo").innerHTML = "Hello World!";
}
// Call the function here
</script>
</body> </html>
```

```
ii) <!DOCTYPE html>
<html>
<body>
<p id="demo">Display the result here.</p>
<script>
var greeting;
var hour = new Date().getHours();
if (hour < 18) {
 greeting = "Good day";
} else {
 greeting = "Good evening";
}
document.getElementById("demo").innerHTML = greeting;
</script>
</body>
</html>
```

e) Define and show the syntax for declaring an array in JavaScript (2 marks)

f) Define the following PHP terms/Phrases [3 marks]

- i. Polymorphism
- ii. Encapsulation
- iii. Constructor

g) State the function of a switch statement (2 marks)

e) Explain the meaning of the following statements as used in JavaScript and give the expected result. (3 marks)

```
Math.round(4.7)
Math.pow(8, 2);
Math.floor(4.7);
```

## Question TWO

a) Write a JavaScript program to sort the items of an array. (12 marks)

Sample array : var arr1 = [ -3, 8, 7, 6, 5, -4, 3, 2, 1 ];

Sample Output : -4,-3,1,2,3,5,6,7,8

b) i) Explain a PHP object. (2 marks)

ii) Explain the following events in JavaScript: onchange, onclick, onmouseover, onmouseout, onkeydown, onload

## Question THREE

a. Here is a PHP code example which defines a class of type Books:

```
<?php
class Books {
 /* Member variables */
 var $price;
 var $title;

 /* Member functions */
 function setPrice($par){
 $this->price = $par;
 }
 function getPrice(){
 echo $this->price . "
";
 }

 function setTitle($par){
 $this->title = $par;
 }
 function getTitle(){
 echo $this->title . "
";
 }
}
?>
```

- i. Explain five key parts of the class. [5 marks]
- ii. Demonstrate how to create three books: maths, physics and chemistry using the **new** operator. [3 marks]
- iii. Show how to set title and prices for the three books by calling member functions. [6 marks]



- b) Using for “for loop” write a JavaScript code that will output the `cars = ["BMW", "Volvo", "Saab", "Ford", "Fiat", "Audi"]` array in a column. (6 marks)

#### Question FOUR

- a) Write a JavaScript program using a switch statement and the `getDay()` method that returns the weekday as a number between 0 and 6. (Sunday=0, Monday=1, Tuesday=2 ..) (10 marks)

- b) i) Differentiate between Local and Global JavaScript Variables. (4 marks)

ii) Write a JavaScript function code as an event (on clicking a button) so that the text “technical university of Mombasa” changes to upper case. (6 marks)

#### Question FIVE

- a) Explain the term Cookies as used in PHP (2 marks)
- b) Write a PHP class that calculates the factorial of an integer. (10 marks)
- c) Write a PHP script to find the maximum and minimum marks from the following set of arrays.
- d) *Sample arrays* :
- ```
$marks1 = array(360,310,310,330,313,375,456,111,256);  
$marks2 = array(350,340,356,330,321);  
$marks3 = array(630,340,570,635,434,255,298);
```
- (8 marks)



TECHNICAL UNIVERSITY OF MOMBASA

**INSTITUTE OF COMPUTING AND INFORMATICS
DEPARTMENT OF BUSINESS ADMINISTRATION
UNIVERSITY EXAMINATION FOR:
BBIT Y1S2
EIT 4102: FUNDAMENTALS OF PROGRAMMING
END OF SEMESTER EXAMINATION
SERIES: APRIL 2016
TIME: 2 HOURS
DATE: Pick Date May 2016**

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of Choose No questions. Attempt Choose instruction.

Do not write on the question paper.

Question ONE

a) Provide definitions for the following terms/phrase.

- i. System program
- ii. Application program
- iii. Programming
- iv. Algorithm [4 marks]

b) Identify three programming constructs [3 marks]

c) Write a C program to check if a number is odd or even and print the number [5 marks]

d) Name and describe four data types in C [6 marks]

e) Outline the computer problem solving steps [6 marks]

f) Write a C Program that prompts a user for a radius and calculates area and circumference of circle [6 marks]

Question TWO

- a) What is a storage class? Outline four storage classes used in C [5 marks]
- b) Write a C program to perform basic arithmetic operations which are addition, subtraction, multiplication and division of two numbers. Numbers are assumed to be integers and will be entered by the user. [5 marks]
- c) Write a C program to print a pyramid pattern as shown [10 marks]

```
  *
 ***
*****
*****
*****
```

Question THREE

- a) List four types of operators in C [4 marks]
- b) Identify the key elements of a program development environment (PDE) [4 marks]
- c) Write a program that stores a sentence entered by a user into a data file [6 marks]
- d) Write a C program that prompts a user for marks and prints A if mark is ≥ 70 , B if marks is ≥ 60 and ≤ 69 , C if mark is ≥ 50 and ≤ 59 , D if mark is ≥ 40 and ≤ 49 and F if mark is < 40 [6 marks]

Question FOUR

- a) Write an algorithm that reads in, displays and exchanges integer values of two variables [4 marks]
- b) Draw a flow chart and write the pseudo code for the algorithm in part a [8 marks]
- c) Implement the algorithm using C programming language. [12 marks]

Question FIVE

- a) Describe three variable scopes in C [6 marks]
- b) Write a C program that illustrates the use of the variables in part a [6 marks]
- c) Write a C program that calculates the factorial of any positive number n. [8 marks]



TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS
DEPARTMENT OF BUSINESS ADMINISTRATION
UNIVERSITY EXAMINATION FOR:
BBIT Y1S2
EIT 4102: FUNDAMENTALS OF PROGRAMMING
END OF SEMESTER EXAMINATION
SERIES: APRIL 2016
TIME: 2 HOURS
DATE: Pick Date May 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of Choose No questions. Attempt Choose instruction.

Do not write on the question paper.

Question ONE

- a) Provide definitions for the following terms/phrase.
- i. Programming syntax [2 marks]
 - ii. Program semantics [2 marks]
 - iii. Programming [2 marks]
 - iv. Algorithm [2 marks]
- b) Describe three programming constructs [3 marks]
- c) Write a C program to find the sum of the first 20 integers [5 marks]
- d) State two methods of defining constants in C. Illustrate how constants may be used in a program that calculates the area a rectangle [6 marks]
- e) Create a function called **max ()** that takes two parameters num1 and num2 and returns the maximum between the two. [3 marks]
- f) Outline the computer problem solving steps [5 marks]

Question TWO

- a) Write a C program to perform basic arithmetic operations which are addition, subtraction, multiplication and division of two numbers. Numbers are assumed to be integers and will be entered by the user.

[10 marks]

- b) Write a C program that uses an array and outputs the following

[10 marks]

```
Element[0] = 100
Element[1] = 101
Element[2] = 102
Element[3] = 103
Element[4] = 104
Element[5] = 105
```

Question THREE

- a) Explain the difference machine language, assembly language and high level language. Give one advantage and one disadvantage for each mentioning where each language may be applied

[10 marks]

- b) Write a C program to print a pyramid pattern as shown

[10 marks]

```
  *
 ***
*****
*****
*****
```

Question FOUR

- a) Describe the key elements of a program development environment (PDE)

[4 marks]

- b) Write a program that stores a sentence entered by a user into a data file

[6 marks]

- c) Write a C program that prompts a user for marks and prints A if mark is ≥ 70 , B if marks is ≥ 60 and ≤ 69 , C if mark is ≥ 50 and ≤ 59 , D if mark is ≥ 40 and ≤ 49 and F if mark is < 40

Question FIVE

- a) Write an algorithm that reads in, displays and exchanges integer values of two variables [4 marks]
- b) Draw a flow chart and write te pseudo code for the algorithm in part a [8 marks]
- c) Implement the algorithm using C programming language. [12 marks]



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN BUILDING AND CIVIL ENGINEERING

EBC 2204 BUILDING TECHNOLOGY AND SERVICES II
END OF SEMESTER EXAMINATION

SERIES: JULY 2017

TIME: 2 HOURS

DATE: ---- JULY 2017

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

-Drawing instruments.

-Scientific calculator

This paper consists of **FIVE** questions. Attempt **any THREE** questions.

Do not write on the question paper

Mobile Phones are NOT allowed inside the examination room

QUESTION ONE

- (a) State **THREE** principal requirements of fire places and flues (3 marks)
- (b) With the aid of sketches explain the construction details of the following elements of fireplaces:-
- (i) External projection of chimney breast
 - (ii) Hearths
 - (iii) Chimney stack through flat roof (7Marks)
- (c) Briefly describe the procedure adopted when inspecting smoky chimney (10 marks)

QUESTION TWO

(a) (i) Explain dry lining

(ii) Name THREE techniques of fixing dry-lining (6marks)

(b) Explain the following paint defects and their remedies

(i) Blistering

(ii) Blistering (4 marks)

(c) (i) State THREE reasons for using suspended ceilings

(ii) Sketch and label cross section of open ceiling (10 marks)

QUESTION THREE

(a) State the principle factors influencing the type of material used for a particular framed construction (4 marks)

(b) With the aid of sketches, explain the following types of stanchion connections

(i) slab or bloom bases

(ii) Gusseted base

(iii) Stanchion cap

(iv) Beam to stanchion (10 marks)

(C) State the advantages of using precast concrete construction (6 marks)

QUESTION FOUR

(a) Explain the following functional requirements of a wall

- (i) Strength and stability
- (ii) Weather resistant
- (iii) Thermal insulation

(8 marks)

(b) State SEVEN building code requirements of formwork

(7 marks)

(c) Sketch and label a cross section of typical beam formwork

(5 marks)

QUESTION FIVE

(a) State FOUR functional requirements of upper floors

(6 marks)

(b) With the aid of a sketch describe the construction of partially self-centering upper floors

(8 marks)

(c) With the aid of a sketch describe the construction of brick facing

(6 marks)



TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS

DEPARTMENT OF MATHEMATICS & PHYSICS

UNIVERSITY EXAMINATION FOR:

Bachelor of Science in Statistics & COMPUTER SCIENCE

EIT 4301: ICT PROFESSIONAL ETHICS EXAM1

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

DATE: Pick Date May 2016

Instructions to Candidates

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.

Question ONE

QUESTION ONE [30 marks]. CASE STUDY: COMPUTER ETHICS

Cybercrime or Computer crime can be defined as offences that are committed against individuals or groups of individuals with a criminal motive to intentionally harm the reputation of the victim or cause physical or mental harm, or loss, to the victim directly or indirectly, using modern telecommunication networks such as Internet (Chat rooms, emails, notice boards and groups) and mobile phones. Such crimes may threaten a nation's security and financial health. Cybercrime can be put into two categories. Those that use computer as a target:- using a computer to attacks other computer, e.g. Hacking, virus/worms attacks, Dos attack etc. and those that use computer as a weapon :- using a computer to commit real world crime e.g. cyber terrorism, credit card fraud and pornography etc. Issues surrounding these types of crimes have become high-profile, particularly those surrounding hacking, copyright infringement, child pornography, and child grooming. There are also problems of privacy when confidential information is intercepted or disclosed, lawfully or otherwise. Internationally, both governmental and non-state actors engage in cybercrimes, including espionage, financial theft, and other cross-border crimes. The international legal system is attempting to hold actors accountable for their actions through the International Criminal Court as well as encouraging all countries that use the internet need to secure their cyberspace.

- Define the term cybercrime. [2 marks]
- Identify two categories of cybercrime. [2 marks]
- Describe five types of cybercrime that are commonly in use. [10 marks]
- Explain five merits of securing cyber space for a country [10 marks]

e. Explain how the following applications can be used to commit computer crime.

[6 marks]

- i. Email
- ii. Mobile phone
- iii. Chat
- iv. Notice board or bulletin boards

Question TWO

a. Define the term ethics in the context of information technology [2 Marks]

b. Describe four primary factors that characterize computer ethics. [6 marks]

c. Identify four types of software licenses. [4 marks]:

d. Define the following ethical terms. [6 marks]

- i. Intellectual Property:
- ii. Trade Secret
- iii. Copyright:
- iv. Patent

e. Describe two ways in which software can be pirated. [2 marks]

Question THREE

a. Explain the following terms/phrases: (6 Marks)

- i. Contract
- ii. Software contract
- iii. Code of conduct

b. Both Ethics and Law complement each other when an individual is using ICT resources. Discuss any three differences between the two [6 Marks]

c. Ethical choices are decisions made by individuals who are responsible for the consequences of their actions.

Explain the following terms: [8 Marks]

- i. Responsibility
- ii. Accountability
- iii. Liability
- iv. *Due process*

Question FOUR

- a. Differentiate between a copyright and a patent. [2 marks]
- b. Explain any five moral dimensions of the information age [10 Marks]
- c. Explain any four key technological trends that raise ethical issues. [8 Marks]

Question FIVE

- a. List five types of individual data held by institutions. [5 marks]
- b. Outline five types of data that can be regarded as sensitive and personal. [5 marks]
- c. State any FIVE commitments highlighted in IEEE code of ethics [5 Marks]
- d. State the Five Acts that are covered by the Computer Misuse Act 1990 regarding the correct use of computers. [5 Marks]



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EIT 4301: ICT PROFESSIONAL ETHICS EXAM2

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

DATE: Pick Date May 2016

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Question ONE

Ethics is a reflection on morality. It refers to the principles of right and wrong in making choices by individuals. It has been described as the art and science that seeks to bring sensitivity and methods to the discernment of moral values (Carbo, 2006). Thus, ethics guide human and societal behavior. Capuro (2006) had no difficulty in asserting that ethics is an unending quest on explicit and implicit use of the moral code. However, ethical issues in ICT persist: Talk of information privacy, data security, plagiarism, technology manipulation, the subject of social and ethical implications of Information and Communication technology has been addressed in the literature. As noted by Carbo (2006) ethical considerations for ICT related issues first appeared under the topic "information ethics" in the Annual Review of Information Science and Technology in 1992. This suggests that there is an ethical agenda associated with the use of ICT. Individuals and organizations therefore need to be ethically sensitive as they deploy ICT on their operations. The impact of ICT on human relationship has been tremendous. ICT has helped to enhance family relationship (e.g. mobile phones, palmtops, laptops, virtual conferencing and so on), as well help to separate family and friends from each other. A wide range of new laws, regulations, rules and practices are therefore needed if society is to manage these workplace and other changes and development brought about by ICT. Thus the society need to consider the following ethical and social challenges related to ICT use:

- a. Define the term ICT ethics [2 marks]
- b. Outline Four Basic concepts in Ethics. [5marks]

- c. Describe five key characteristics of an Ethical Analysis [5 marks]
- d. List TWO Differences between Ethics and Laws [4 marks]
- e. Explain five ethical issues listed in the case study [10 marks]
- f. Identify five key areas where ethical issues may arise for an organization [5 marks]

QUESTION 2[20 marks]

- a. Explain the following social problems resulting from existence of computers:
 - i. Software theft
 - ii. Cyber crime
 - iii. Computer misuse
 - iv. Computer Crime
 - v. Computer errors [10 Marks]
- b. Identify four types of software licenses. [4 marks]:
- c. Define the following ethical terms. [6 marks]
 - i. Intellectual Property:
 - ii. Trade Secret
 - iii. Copyright:
 - iv. Patent

QUESTION 3[20 MARKS]

- a. Explain the following terms/phrases: (6 Marks)
 - i. Contract
 - ii. Software contract
 - iii. Code of conduct
- b. Both Ethics and Law complement each other when an individual is using ICT resources. Discuss any three differences between the two. [6 Marks]
- c. Ethical choices are decisions made by individuals who are responsible for the consequences of their actions. Explain the following terms: (8 Marks)
 - i. Responsibility
 - ii. Accountability
 - iii. Liability
 - iv. *Due process*

Question 4 [20 marks]

- a. Differentiate between a copyright and a patent. [2 marks]
- b. Explain any five moral dimensions of the information age [10 Marks]
- c. Explain any four key technological trends that raise ethical issues. [8 Marks]

QUESTION FIVE [20 marks]:

- a. List five types of individual data held by institutions. [5 marks]
- b. Outline five types of data that can be regarded as sensitive and personal. [5 marks]
- c. State any FIVE commitments highlighted in IEEE code of ethics [5 Marks]
- d. State the Five Acts that are covered by the Computer Misuse Act 1990 regarding the correct use of computers. [5 Marks]