



TECHNICAL UNIVERISTY OF MOMBASA

# Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR:  
BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

ICS 2175: COMPUTER PROGRAMMING

END OF SEMESTER EXAMINATION

**SERIES: AUGUST 2013**

**TIME: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Attempt question **ONE** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

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**Question One (Compulsory)**

- a) Define the following terms: **(10 marks)**
- (i) Program
  - (ii) Programming
  - (iii) Program flow chart
  - (iv) Software
  - (v) Algorithm
- b) Differentiate between the following terms as used in computer programming:
- (i) Debugging and testing
  - (ii) Syntax error and logical error
  - (iii) Source code and object code
  - (iv) Compiler and interpreter **(12 marks)**
- c) Develop a program algorithm (using both program flowchart and pseudocode) that allows a user to input the radius and the height of a cylinder and computer the volume of the cylinder. The program should display the computed results (Hint:  $PIE = 3.14$ ) **(8 marks)**

### Question Two

- a) Explain the term “Disk Checking” as used in algorithm development. **(4 marks)**
- b) Type question (b) are shown in the original
- c) Explain the role of a linker and a loader in the execution of a software program. **(4 marks)**
- d) Given the following algorithm statement, develop a program flowchart that can be used to represent the same algorithm. If value of hourworked is less than or equal to 30 men normal pay is calculated as hours\* rate and overtimepay is 0. If the value of hours worked is greater than 30 then normal pay is calculated by multiplying the hours in excess of 30 by rate times 1.5 i.e. (hours-30\* rate\* 1.5) **(8 marks)**

### Question Three

- a) Develop a program that accepts two numbers from the keyboard calculate the sum and displays it on the screen. **(6 marks)**
- b) One of the qualities of a good program is readability. As a result there are a number of techniques employed by programmers to ensure that programs are readable. Discuss any TWO of them. **(4 marks)**
- c) Write an algorithm (Program pseudo code) to determine whether a number entered is ODD or EVEN (HINT: Use the MODULUS operator) **(5 marks)**

### Question Four

- a) Differentiate between: pre-processor directive and declaration. **(2 marks)**
- b) Explain any SIX features of a good program algorithm **(6 marks)**
- c) List and explain TWO advantage of using functions when programming **(4 marks)**
- d) Discuss the advantage and disadvantage of the following:
- (i) Structured programming
  - (ii) Modular programming

### Question Five

- a) State the SIX factors considered when choosing a good programming language. **(6 marks)**
- b) Discuss the importance of the following program control structures:
- (i) Selection (Decision) construct
  - (ii) Repetition (looping) construct **(4 marks)**
- c) With the help of a block diagram, explain Program Development Lifecycle. **(6 marks)**
- d) Write a C program that outputs the even numbers, between 1 and 20, along with their square and cubes in the format shown below. (Hint: Use do while...loop structure)

Number	Square	Cube
2	4	8
4	16	64
6	36	216

...                    ...                    ...  
...                    ...                    ...  
20                    400                    8000

**(4 marks)**