MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

OBJECT ORIENTED PROGRAMMING

DATE: 15/4/2019   **TIME: 2.30-5.30 PM**

INSTRUCTIONS

Answer any five questions

QUESTION ONE (20 MARKS)

a)   Distinguish between the following terms as applied in *Object Oriented programming*

      i.   Constant and variable.

      ii.   Polymorphism and Inheritance.

      iii.   Object and Class.

      iv.   Encapsulation and abstraction   (8 marks)

b)   Explain the meaning of the term *Object Oriented programming*.   (2 marks)

c)   The figure below shows an open cylinder. Write a C++ program that will   implement a class name cylinder with the appropriate dimensions only. The program should determine and output the volume of the cylinder.

      Hint: Volume=$\pi r^2 h$ (6 marks)
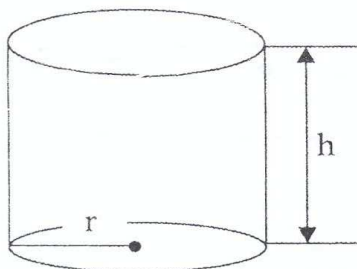
d)   Explain any **two** operators used in C++ programming.   (4 marks)

QUESTION TWO (20 MARKS)

a) Explain any **three** applications of **OOP**. (6 marks)

b) Distinguish between *function declaration* and *function definition* as applied in C++ programming language. (4 marks)

c) Write a C++ program that will prompt the user to enter a number. The Program then determines the *square root* of the number though a *built-in* Function and displays the result on the screen. (4 marks)

d) Describe the **two** different types of *arguments*. (4 marks)

e) Explain the meaning of *control flow* as used in C++ programming. (2 marks)

QUESTION THREE (20 MARKS)

a) With the aid of an example describe the concept of *function overloading* as applied in OOP. (4 marks)

b) Write a C++ program that uses an *array* to store **ten** values .it should then print out the numbers in *reverse*. (8 marks)

c) Explain the meaning of the term *Array* as used in C++. (2 marks)

d) Write a C++ program that will implement a class containing the dimensions of *right angled triangle* (base and height) and a *parameterized constructor* to initialize the dimension as **12cm** and **5cm** respectively. The program should then determine the *length* of the 3rd side through the use of a function and output it. (6 marks)

QUESTION FOUR (20 MARKS)

a) Explain any **two** qualities of a good program (2 marks)

b) Explain the different *scopes of variables* in C++ programming. (6 marks)

c) Write a C++ program that will prompt the user to enter their **two** names using an *Array* and then display them. (6 marks)

d) Write a C++ Program to calculate the **sum** of 5 subjects and find the *percentage* of each subject (6 marks)

QUESTION FIVE (20 MARKS)

a) Explain the methods of *initializing* an Array. (4 marks)

b) Write a C++ program that will accept a *number* n and display *sum of series* from one to n eg 1+1/2+1/3+1……..../n+1. (6 marks)

c) Explain the meaning of the following terms as used in C++ programming
   i.   Source code.
   ii.   Object code.
   iii.   Executable code.
   iv.   Pseudo code.   (8 marks)

   d) C++ is a *strongly typed* programming language. Explain the reason why.   (2 marks)

QUESTION SIX (20 MARKS)

Write a C++ program that will prompt the user to enter the *date and year*. The year Should not be greater than 2020 and not less than 1900 otherwise an error message should be displayed. The date includes day and month. The program should also check if the day entered is equal to the number of days in that particular month, if not so the program should then display an *error* message that the date is invalid otherwise it should display the *date and year*.   (20 marks)

QUESTION SEVEN (20 MARKS)

a)   Write a C++ program that will *accept a value* then display the value, and a Message indicating whether the value its an *even* number or an *odd* number.   (6 marks)

b)   Explain any **four** advantages of a function.   (4 marks)

c)   Write a C++ *function* that will calculate the area of a circle, and then demonstrate how the function is *called*.   (6 marks)

d)   Explain the meaning of the term *Jump* as used in C++ programming.   (2 marks)

e)   Explain the *logical operator* as used in C programming   (2 marks)

QUESTION EIGHT (20 MARKS)

a)   Implement a structure with the following *attributes*: employee name, employee number, location and address. Declare an array of **20** employees then read in their values and display them.   (10 marks)

b)   In recent army recruitment, recruits were manually admitted to KDF based on the following criteria;
      i.   Height should be not less than 5.4 feet
      ii.   Weight should not be less than 55 kg
      iii. And they should be Kenyan citizens aged 18 and above
      iv.   Have no criminal record

If none of these criteria is met, they are sent back and told to try again next time. i.e. "Not Qualified, Try Next Time" and if ALL the criteria is met, "Congratulations, Welcome to the Kenya Defense Forces". As a computer programmer, write the code to in C++ to actualize the process (6 marks)

c) Outline any **four** characteristics of Constructors (4 marks)