



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

(A Centre of Excellence)

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

**DIPLOMA IN INFORMATION TECHNOLOGY
(DICT 10A/DICT 11M)**

ECT 2204: OBJECT ORIENT PROGRAMMING

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: OCTOBER 2012

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions

Answer 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

SECTION A (COMPULSORY)

Question One (20 marks)

- a) Explain the following terms:
- i) Class
 - ii) Object
 - iii) Inheritance
 - iv) Polymorphism
- b) State any **SIX** benefits of object orient programming. **(8 marks)**
- c) Distinguish between constructors and destructors. **(6 marks)**
- d) Explain the term ‘Data Hiding’ **(4 marks)**
(2 marks)

SECTION B (Answer Any Two Questions)

Question Two (20 marks)

- a) List **THREE** ways in which an object can be passed as an argument to a function. **(3 marks)**
- b) Write a class definition ‘student’ with three member variables ID, cat_mark and exam_mark and three functions set_values, find_grade and print. The function set values gets values of ID, cat mark and exam mark. The function findgrade adds catmark and exammark and return the grade. The function Print Display ID and the grade. The grade is calculated as follows: **(17 marks)**

Mark (Catmark + Exammark)	Grade
0 – 49	F
50 – 59	C
60 – 69	B
70 – 100	A

Question Three (20 marks)

- a) State **FOUR** ways in which a constructor differs from a member function. **(4 marks)**
- b) Explain the term ‘overloading’ **(2 marks)**
- c) By means of a suitable example, show how a function can be overloaded. **(6 marks)**
- d) With aid of suitable example explain what is meant by default constructor. **(6 marks)**
- e) Explain naming rules for constructor. **(2 marks)**

Question Four (20 marks)

- a) Explain ‘friend function’ **(2 marks)**

- b) A Class, Example has been defined as shown below. Include in the class definition a friend function called calculate to perform the following arithmetic $2*a + (b + c)$. Show how the class may be implemented. **(9 marks)**

```
#include <isotream.h>

Class Example

{int a, b, c;

void setvalues (int A, int B, int C)

{a = A; b = B; c = C}

} // end of class
```

- c) Write C++ code that will read marks of 20 students and output the number of students who passed the exam and the number of students who failed. The pass mark is the average mark of the 20 students. **(9 marks)**

Question Five (20 marks)

- a) Briefly explain the concept of polymorphism as applied to OOP. **(2 marks)**
b) State any **THREE** types of polymorphism available in C++ **(2 marks)**
c) Describe the scope of variables in C++. **(4 marks)**
d) Given the class definition below:

```
{private:
int X, Y, Z;
Protected:
char strName [25];
Public:
void setInfo(Char *Name, int X1, int Y1, int Z1
{strncpy ((strName, Name, 25);
X = X1; Y = Y1, Z = Z1;
}

};
```

Write definition of class 'EX 1' which is derived from 'EX' and has one additional data member B1 and two additional member functions:

1. Add which returns $(X+Y+Z)/B$ **(6 marks)**
2. 'Print' which displays values of StrName and result of function 'Add' **(6 marks)**