Machakos University College

(A Constituent College of Kenyatta University)
UNIVERSITY EXAMINATIONS 2013/2014
SCHOOL OF COMPUTING AND APPLIED SCIENCE

SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 209: MICROPROCESSOR AND ASSEMBLY LANGUAGE

DATE: 7TH APRIL, 2014 **TIME:** 8.30 a.m. – 10.30 a.m.

Question 1: Compulsory (20 Marks)

a) Explain the meaning of the following terms as they relate to Assembly language programming

i. Compiler
ii. Assembler
iii. Machine language
iv. Interpreter
v. Translator
vi. Register **(6 Marks)**

b) The following code defines the start of a class to represent bank accounts:

```
class BankAccount(object):
interest_rate = 0.3
def __init__(self, name, number, balance):
        self.name = name
    self.number = number
    self.balance = balance
    return
```

i. Name the class variables and the instance variables in the given code.

(4 Marks)

ii. Add instance methods called **deposit()** and **withdraw()** which increase and decrease the balance of the account. Make sure the withdraw() method doesn't allow the account to go into overdraft. Add a third method called **add_interest()** which adds interest to the balance (the interest should be the interest rate multiplied by the current balance). **(10 Marks)**

Question 2: (20 Marks)

a) Compare and contrast RISC and CISC. What are the advantages and disadvantages of each? **(10 Marks)**

b) Translate the following for loop into a while loop

```
for i in range(1,10):
print "i = ", I
```

(4 Marks)

c) Write a program in python to sum the number of integers from 1 to a given number n. **(4 Marks)**

d) What does the following code do?

```
def a(b, c, d): pass
```

(2 Marks)

Question 3: (20 Marks)

a) Explain the fetch-execute cycle. **(6 Marks)**

b) List and explain any THREE advantages that assembly language have over High level languages. **(9 Marks)**

c) Name and give an example of the three types of errors that might be contained in a Python program. **(3 Marks)**

d) Write a python program that creates a list of all the integers less than 100 that are multiples of 3 or 5. **(2 Marks)**

Question 4: (20 Marks)

a) What is a recursive function? **(2 Marks)**

b) Write an iterative python function that returns the sum of all elements in a list. For example, given the list [1, 2, 3] the function should return 6 (ie 1+2+3 = 6). **(6 Marks)**

c) The following code implements a recursive function in Python called foobar.

```
def foobar(arg):
if arg == []:
```

return arg

else:

return foobar(arg[1:]) + [arg[0]]

What does the foobar function do? Write a line of code which calls the foobar function with a suitable argument and state what the return value will be. **(8 Marks)**

d) Identify and correct the mistakes in the following python code:

def hello()

....print "hello world" **(2 Marks)**

e) Briefly explain what mutable means and name a Python variable type that is mutable. **(2 Marks)**

Question 5: (20 Marks)

a) What are the two ways to add something to a list? How are they different? **(4 Marks)**

b) What are the two ways to remove something from a list? How are they different? **(4 Marks)**

c) What is the difference between a list and a tuple? **(4 Marks)**

d) Write a short Python code segment that adds up the lengths of all the words in a list and then prints the average (mean) length. **(8 Marks)**