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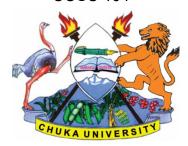

UNIVERSITY EXAMINATIONS
ODEL
EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF COMMERCE
COSC 104: INTRODUCTION TO COMPUTER PROGRAMMING METHODOLOGIES
STREAMS: Y2S1   **TIME:2 HOURS**
DAY/DATE: FRIDAY 6/12/2019   **2.30 P.M – 4.30 P.M**

INSTRUCTIONS:
- Answer **QUESTION 1** in section A and any other **TWO QUESTIONS** from section B.
- Write your answers **legibly** and use your time wisely.

QUESTION ONE [30 MARKS] ATTEMPT ALL QUESTIONS IN THIS SECTION
- (i)   Explain the meaning of computer programming
                [2marks]
- (ii)   What is a variable? State its declaration and initialization   [4marks]
- (iii) A C storage class defines the scope (visibility) and lifetime of variables with a c program. Discuss any four   [8marks]
- (iv)   The type void specifies that no value is available. Discuss three kinds of situations where it is used in c programming
         [6marks]
- (v)   A c program basically consists of 5 parts. Explain.   [5marks]
- (vi)   Write a c program to find largest of the three input numbers entered by the user
         [5marks]

SECTION B: ANSWER ONLY TWO QUESTIONS FROM THIS SECTION
QUESTION 2[20MARKS]
- (i)   A c program consists of various tokens. A token is either a **keyword**, an **identifier**, a **constant**, a **string literal** or a **symbol**. With use of appropriate examples, discuss.

         [10marks]
- (ii)   Explain the following terms as used in c language.
         (a) Basic types   [2marks]
         (b) Enumerated types   [4marks]
         (c) The type void   [2marks]
         (d) Derived types   [2marks]

QUESTION 3 [20MKS]

By use of control constructs, demonstrates how the following would be achieved.

a) A program to sum the number of integers from 1 to a given number n.   [4 marks]

b) A program which sums the contents of a integer list or array.   [4 marks]

c) Translate the following for loop into a while loop (which does the same thing as the for loop):

> *for i in range(1,10):*
> *print "i = ", i*

[8 marks]

d) Translate the following while loop into a for loop (which does the same thing as the while loop):

> *i = 20*
> *while (i > 0):*
> *print "i = ", i*
> *i =- 1*

[4 marks]

QUESTION 4: 20 MRKS

(a) What differentiates a function from a procedure? illustrate   [4marks]

(b) Explain how a function or a procedure simplifies the task of programming.   [6marks]

(b) Write a program that uses a function to calculate the area of a circle   [10marks]

QUESTION 5 [20 MKS]

a) What is a recursive function?   [2 marks]

b) The following iterative function returns the sum of all elements in a list. For example, given the list [1, 2, 3] the function will return 1+2+3 or 6. Re-write the function as a recursive function.

```
def sum(arg):
result = 0
for i in arg:
result += i
return result
```
          [10 marks]

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

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

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

[8 marks]