SCOTT CHRISTIAN UNIVERSITY
EXAMINATIONS
28 JUL 2025
SIGN.....
P. O. BOX 43 - 90100, MACHAKOS.

Scott Christian
UNIVERSITY
A Dynamic Centre of Academic Excellence

SCHOOL OF EDUCATION AND BUSINESS STUDIES

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

UNIT CODE/NAME: DCT 027: STRUCTURED PROGRAMMING

May – August 2024/2025 End Semester Exams - Time: 2 Hours

Instructions: Answer Question ONE (Compulsory) and any other TWO questions.

QUESTION ONE (30 MARKS) [COMPULSORY]

a) Differentiate the following terms as used in programming **(4 Marks)**

   i) Program and Algorithm

   ii) Local variable and global variable

b) As a programmer who wishes to design a system using the modular approach, highlight four advantages you're likely to derive from using this approach **(4 Marks)**

c) Describe the operations of an array and a structure as a data structure. **(4 Marks)**

d) C is used in many domains due to its efficiency and control. Describe three real-world applications of C programming and explain why C is suited for those tasks. **(6 Marks)**

e) A solution is required that will capture and store the CAT marks of the BCS 1101 class in an array, the program should then calculate and output the average mark, the lowest and the highest mark. Devise an algorithm and write a C program to solve the problem.**(6 Marks)**

f) The table below shows the main menu of a management information system. Use it to answer the question that follows.

Option	Menu Activity
1	Capture a New Student
2	Edit Record
3	Check Balance
	Close Record

Write a C program that would prompt a user to enter an option. The program should then output the menu activity. Use the *switch..case* statement **(6 Marks)**

SECTION B (Answer ANY TWO. Each question carries 20 Marks)

QUESTION TWO (20 Marks)

a) Highlight the role of the following softwares: **(3 Marks)**
   i) Compiler
   ii) Text editor
   iii) Assembler

b) Discuss four factors that can be used to determine the qualities of a good programming language. **(4 Marks)**

c) A program is required to calculate an employee's net salary from the gross pay. The net salary is given by gross pay less deductions. Deductions include: 25% of the gross pay as tax, Ksh. 250 as NSSF contribution and Ksh. 500 as NHIF contribution.
   (i) Design a pseudo code for this program **(3 Marks)**
   (ii) Implement the above program in C. **(5 Marks)**

QUESTION THREE (20 Marks)

a) Define the term comment as used in programming and state any three roles of comments in a program. **(3 Marks)**

b) Explain the differences between the following terms:
   i) White box testing and Black box testing **(2 Marks)**
   ii) Machine code and source code **(2 Marks)**

c) A solution is required that accepts the price of one product in two supermarkets, your program should compare the prices and display a message saying which supermarket is more expensive that the other or whether they are the same.
   i) Devise a suitable flowchart for the above solution **(3 Marks)**
   ii) Write a C program to solve the above problem. **(5 Marks)**

QUESTION FOUR (20 Marks)

a) Describe using examples any three types of program errors. **(3 Marks)**

b) Explain any four types of documentation done on a computer program. **(4 Marks)**

c) The following is a C program segment. Use it to answer the question that follows

```
{
int a,b,c,y;
b=++a;
c=b++;
y=b+c;
}
```

Given that the value of a is 6, evaluate the value for b, c and y. **(3 Marks)**

d) Write a C program that will accept the item code of a product and display the respective product name using the table below. Use the *if* statement. **(5 Marks)**

Code	Item
A	Pencil
B	Book
C	Pen
D	Rubber

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QUESTION FIVE (20 Marks)

a) Discuss the stages involved in a program development cycle. **(7 Marks)**

b) Write a program that converts degrees Fahrenheit (F) to degrees Celsius (C) using the following formula: $C = (F - 32) / 1.8$. The value of F should be entered via the keyboard. **(3 Marks)**

c) Develop a program that: **(5 Marks)**

i) Reads ten (10) integers from the user into an array.

ii) Implements a function findMax() that returns the maximum value in the array.

iii) Implements another function findAverage() that returns the average of the values.

iv) Displays the maximum and average values.

End of Examination

