



MANICALAND STATE UNIVERSITY OF APPLIED SCIENCES

**FACULTY OF ENGINEERING, APPLIED SCIENCES AND
TECHNOLOGY**

DEPARTMENT: COMPUTER SCIENCE AND INFORMATION SYSTEMS

MODULE: PRINCIPLES OF COMPUTER PROGRAMMING

CODE: INSY103/BCOS112

SESSIONAL EXAMINATIONS

JUNE 2024

DURATION: 2 HOURS

EXAMINER: Dr C. KURANGA

INSTRUCTIONS

- 1. Answer Question 1 and any other three questions*
- 2. Each question carries 25 marks*
- 3. Start a new question on a fresh page*

SECTION A

Question 1

- a) Explore a brief history of computer programming languages. [10]
- b) With the aid of examples, explain formatted input and output statements. [4]
- c) Explain the different phases of solving a given problem using computer. [6]
- d) With the aid of examples, explain the various types of tokens. [7]
- e) Discuss the rules to be followed while naming identifiers. [8]
- f) Find the result of each of the following expressions with $i=4$, $j=2$, $k=6$, $a=2$. [5]
 - i) $k*=i+j$
 - ii) $j=j/=k$
 - iii) $i\%=i/3$
 - iv) $m= i+(j=2+k)$
 - v) $a=i*(j/=k/2)$

SECTION B

Question 2

- a) Discuss format specifiers used in `scanf()` function to read int, float, char, double and long int data types. [4]
- b) Explain different data types available in C. [4]
- c) With the aid of examples, explore precedence and associativity of operators in C. [12]

Question 3

- a) Write a program that computes loan payments. The program reads interest rate, number of years, and loan amount, and displays the monthly and total payments. The formula to compute the monthly payment is as follows:

$$\text{monthlyPayment} = \frac{\text{loanAmount} \times \text{monthlyInterestRate}}{1 - \frac{1}{(1 + \text{monthlyInterestRate})^{\text{numOfYears} \times 12}}}$$

[11]

b) Discuss three programming methodologies.

[9]

Question 4

a) Explain unary operators in C.

[8]

b) With the aid of examples and syntax, explore any two different decision making statements.

[12]

Question 5

a) Write a program to find the factorial of a number.

[8]

b) Explain the use of break and continue statements.

[12]

Question 6

a) Write a program that uses nested loops to draw this pattern:

```
*****
****
***
**
*
```

[8]

b) A customer in a store is purchasing 5 items.

Write a program that asks for the price of each item and then displays the subtotal of the sale, the amount of sales tax and the total. Assume the sales tax is 7%. [12]

END OF EXAMINATION