

BOWEN UNIVERSITY IWO, OSUN STATE
COLLEGE OF COMPUTING AND COMMUNICATION STUDIES
COMPUTER SCIENCE PROGRAMME

B. SC. DEGREE FIRST SEMESTER EXAMINATION SESSION: 2023/2024
COURSE CODE: CSC 403 COURSE TITLE: SURVEY OF PROGRAMMING
LANGUAGES

COURSE CREDIT: 3 DATE:
INSTRUCTION:

TIME ALLOWED: 2 HOURS 30 MINUTES
Answer question ONE and any other THREE questions

QUESTION ONE

- a. What do you understand by the compilation process? Each of the phases of the compiler processes the source program in a particular way and also carries out some operations on the source code being compiled. Consider the operations below; specify which of the phases of the compiler would perform such operation. Keep your answers short and straight to the point. **(5 marks)**
- i. Enhances the runtime and execution of the program,
 - ii. Checks the compatibility of the identifier and their types,
 - iii. Flags error message on seeing two operators standing side by side,
 - iv. Stores identifiers with their names and types.
- b. Define Language paradigm. Why do we need so many programming paradigms? Explain briefly two programming paradigms with examples of programming languages used in each case. **(5 marks)**
- c. What do you understand by the term "programming"? In your own opinion, briefly explain three major concerns that necessitate the concept of programming in high level Languages. **(5 marks)**
- d. Give a brief definition of syntax analysis? In a tabular form state out the differences between syntax and semantics of a programming language. **(5 marks)**
- e. What is operator precedence? Study the following program to test the order of precedence of arithmetic operators in Python. What will be the value of w, x, y and z after the program is executed? **(5 marks)**

Def precedence():

```
a = 10
b = 6
c = 1
d = 3
x = 0
y = 0
w = 0.0
z = 0.0
```

```
w = a**2 - b * (c + d)
x = a + b * (c // d) # Using integer division in Python
y = a * ((b + c) // d) # Using integer division in Python
z = (a + b) - c / d
```

```
print("The value of w is:", w)
print("The value of x is:", x)
print("The value of y is:", y)
print("The value of z is:", z)
```

precedence()

QUESTION TWO

- You are given a programming problem that can be solved using more than one programming languages. Discuss briefly three criteria that would inform the choice of the one you will eventually use to solve the problem. **(5 marks)**
- Explain the concept of data type in computer programming. Hence, differentiate between the following pairs of data type: **(5 marks)**
 - List and Array
 - Float and Double
 - Char and String
- What is a variable? Naming conventions in computer programming depends on a particular language. Nevertheless, a few conventions have become general standards when naming variables. Explain four (4) of them. **(5 marks)**

QUESTION THREE

- What do you understand by the term "Grammar"? Give the formal (mathematical) syntax of a grammar as proposed by Noam Chomsky in 1956, explaining its components. **(6 marks)**
- Why are production rules an important component of a grammar? Find the Language $L(G)$ generated by the Grammar $G = (\{S, B\}, \{a, b, c\}, S, P)$. Given that P consists of following production rule: **(6 marks)**
 - $S \rightarrow abc$
 - $S \rightarrow aBSc$
 - $Ba \rightarrow aB$
 - $Bb \rightarrow bb$
- What is the relationship between the production rules and the start symbol of a formal grammar? **(3 marks)**

QUESTION FOUR

- Consider the following application domains, discuss the features of the programming languages that are best suitable for each of them, hence, give 2 examples in each case. **(6 marks)**
 - System programming
 - Artificial Intelligent
 - Mathematical/Scientific programming
- What is Modular Programming (MP)? Explain three advantages of practising MP. What are its drawbacks? **(5 marks)**
- Explain the technological advancements that made third generation language (3GL) to be more preferred and accepted than 2GL in the programming world. **(4 marks)**

QUESTION FIVE

- a. What is looping in computer programming? Mention three types of basic iteration construct in JAVA. (5 marks)
- b. Write and explain the syntax of a FOR loop in Java. (5 marks)
- c. What are programming languages building blocks? Discuss any four building blocks of your choice of programming language, in each case, give a suitable example. (5 marks)

QUESTION SIX

- a. Mention five features of C# that position it competitively among other object-oriented programming languages in modern programming. (5 marks)
- b. In a tabular form, explain five distinctions between interpreter and compilation. (5 marks)
- c. Discuss briefly five reasons a computer programmer should be conversant with concepts of programming languages. (5 marks)