

**BOWEN UNIVERSITY, IWO**  
**COLLEGE OF COMPUTING AND COMMUNICATION STUDIES**  
**COMPUTER SCIENCE PROGRAMME**  
**B.Sc. DEGREE SECOND SEMESTER EXAMINATION 2022/2023 SESSION**  
**COURSE CODE: CIT 430    COURSE TITLE: ORGANIZATION OF PROGRAMMING**  
**LANGUAGES**  
**COURSE CREDIT: 3            DATE:            DURATION: 2½ HOURS**  
**INSTRUCTION: ATTEMPT ANY FOUR QUESTIONS**

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**Question One**

- a. List the justifications for the study of Organization of Programming Languages **(6 marks)**
- b. Write short notes on the following with examples: **(16 marks)**
  - i. Imperative Languages ii. Functional Languages iii. Logic Programming Languages
  - iv. Object-Oriented Languages
- c. What output is generated by the lines of code below? **(3 marks)**

```
#include <iostream>
using namespace std;
int main(void)
{
    int total = 0;
    for ( int i=0, j=-3; i > j; i--, j++)
    {
        total = total + i + j;
        cout<< total<<"\n";
    }
    cout<< "Total = "<< total<<"\n";
    return 0;
}
```

**Question Two**

- a. A new programming language has just been released. List and write short notes on the criteria you would use in evaluating it. **(8 marks)**
- b. How do the following affect the simplicity of a program written in a particular programming language?
  - i. Size of Basic Types ii. Feature Multiplicity iii. Overloading **(6 marks)**
- c. What is aliasing? **(2 marks)**
- d. You are to choose between two programming languages for the development of a new project and the cost is the main determinant. What various costs are you going to consider? **6 marks)**
- e. State two programming design methodologies you are aware of with an example of a language to support each. **(3 marks)**

**Question Three**

- a. List the different lexeme categories in a programming language. **(4 marks)**
- b. Identify the lexemes in the main program below and group them under the categories identified in question 3a. **(8 marks)**

```
int main(void)
{
    int total = 0;
    for ( int i=0, j=-3; i > j; i--, j++)
    {
```

```

total = total + i + j;
cout<< total<<"\n";
}
cout<< "Total = "<< total<<endl;
return 0;
}

```

- c. i. Briefly describe Backus-Normal Form (BNF). (4 marks)
- ii. Write a BNF for a **digit** (0 to 9), **letter** (A to Z) and **identifier** (that consists of a single letter or letters or that starts with an underscore followed by letter(s). No digit is allowed in the identifier) (6 marks)
- d. List three different times binding can occur. (3 marks)

#### Question Four

- a. Why do you think static typing is beneficial? (6 marks)
- b. Why do you think binding the declaration of a local variable to a different store location each time a procedure is entered is both advantageous and disadvantageous? (4 marks)
- c. Why in your own opinion, it is not necessary to have static variables in object-oriented languages? (2 marks)
- d. i. What type would you use to store the months of the year if you are using C or C++? (2 marks)
- ii. What operations can be applied on that particular type? (2 marks)
- e. List and write short notes on the features of an array. (9 marks)

#### Question Five

- a. In designing abstract data types in a new language you want to design, what issues must be addressed? (10 marks)

- b. Consider the program below:

```

#include <iostream>
using namespace std;
int main(void)
{
    int answer = -5 + 6/3*2;
    cout<<"Answer= " << answer<<endl;
    bool a, b, c, d, ans;
    a=b=true;
    b=c=false;
    ans = ( !a || !c and b );
    cout<< "Ans= " << ans<< endl;
    return 0;
}

```

- i. What is the value of **answer** printed? (3 marks)
- ii. What is the value of **ans** printed? (3 marks)
- c. i. What are exceptions in programs? (1 mark)
- ii. List four types of errors that can cause exceptions in programs. (8 marks)

#### Question Six

- a. i. Define run-time system in operating systems and illustrate with the aid of a diagram (6 marks)
- ii. List two main functions of run-time system in operating system (4 marks)
- b. List six run-time system structures and discuss any three (15 marks)