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KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2023/2024 ACADEMIC YEAR
THIRD YEAR, FIRST SEMESTER EXAMINATION
FOR THE BACHELOR OF BUSINESS INFORMATION TECHNOLOGY
KBI 2303 – SPECIALIZED PROGRAMMING LANGUAGES

Date: 14TH AUGUST 2023
Time: 2:30PM – 4:30PM

INSTRUCTIONS TO CANDIDATES
ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS
QUESTION ONE (30 MARKS)

a) Differentiate between the following terms as used in computer programming languages
   i)   Compiler and an interpreter   (2 Marks)
   ii)   AWT and Swing   (2 Marks)
   iii) JDK and JVM   (2 Marks)
   iv)   Source code and Byte code   (2 Marks)
b) Enumerate any four roles of a lexical analyzer   (4 Marks)
c) Distinguish between compilation and interpretation   (4 Marks)
d) Give the reasons for optimizing the code   (2 Marks)
e) Distinguish between Input () and print () function in python   (2 Marks)
f) Differentiate between low level and high level programming languages   (4 Marks)
g) Perform a lexical analysis on the following program and count the number of valid tokens
                                                                                 (6 Marks)

```
1.int main ()
2.{
3.  int a = 10, b = 20;
4.  printf("sum is :%d",a+b);
5.  return 0;
6.}
```

QUESTION TWO (20 MARKS)

a) Describe the following structure and analysis commonality features of computer programming languages
   i)   Syntactic
   ii)   Lexical
   iii) Pragmatic
   iv)   Semantic   (8 Marks)
b) Describe the symbol table and states its roles   (2 Marks)

c)   Prolog is a logical and a declarative programming language. Discuss the applications of Prolog
                                                                                              (5 Marks)
d)   Consider the following information given by consumers surveying bureau of Kenya:
      An ES has the following facts and rules.
      IF one has at least 1 million shillings to invest AND has basic knowledge of running businesses
      THEN he should invest in securities.
      IF the person's annual income is 50 million AND has basic knowledge of running businesses
      THEN he should invest in stocks.
      IF a person is younger than 30 but older than 22 THEN he should invest in stocks.
      IF a person is younger than 30 but older than 22 THEN he has basic knowledge of running
      businesses.
      IF a person wants to invest in stocks THEN he should invest KenGen shares.
Using symbolic representation, show the production-rule knowledge base containing the above
information   (5 Marks)

QUESTION THREE (20 MARKS)

a)   Describe the following terminologies as used in lexical analysis
      i)   Token
      ii)   Pattern
      iii) Lexeme   (6 Marks)
b)   Explain parsing in compiler design   (4 Marks)
c)   List any four high level programming languages. Describe one feature of each of the four high
      level languages   (8 Marks)
d)   Enumerate two classified of optimization   (2 Marks)

QUESTION FOUR (20 MARKS)

a)   In software development, if we need to choose a language for a project, we need to ask a few
      questions to ourselves before we make any decision. Highlight any five factors considered in
      choosing a language   (5 Marks)
b)   Program to calculate the area of the rectangle can be implemented in varied ways.
      i)   Develop an Algorithm to achieved above solution   (5 Marks)
      ii)   Implement algorithm in b (i) using Java language   (5 Marks)
      iii) Implement algorithm in b (i) using Java language Python   (5 Marks)

QUESTION FIVE (20 MARKS)

a)   Explain the following programming paradigms giving examples
      i)   Functional programming
      ii)   Imperative programming
      iii) Object Oriented programming   (6 Marks)
b)   Describe the advantages of intermediate code in programming languages   (4 Marks)
c)   Elucidate the six phases of a compiler   (6 Marks)
d)   Examine the attributes of a good language   (4 Marks)