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MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY

UNIVERSITY EXAMINATIONS 2021/2022 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS YEAR TWO SEMESTER TWO EXAMINATIONS

FOR THE BACHELOR IN INFORMATION TECHNOLOGY

COURSE CODE : BIT 324E
COURSE TITLE : PRINCIPLES OF PROGRAMMING

DATE: TUESDAY 26TH APRIL, 2022 **TIME:** 8:00-10:00AM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

Question #1 [30 Marks]

a) How does execution of a machine code program on a von Neuman architecture computer occur? [3mks]

b) Explain two programming language deficiencies that were discovered as a result of the research in software development in the 1970 [3mks]

c) Explain briefly the three fundamental features of object- oriented programming [3mks]

d) What arguments can you make against the idea of a single language for all programing domains? [2mks]

e) Some programming languages for example, Pascal have used the semicolon to separate statements, while java uses it to terminate statements. Which of these in your opinion is most natural and least likely to result in syntax errors? Support your answer [4mks]

f) Explain the following compelling reasons have contributes to computer scientist learning about all programming languages

i) Improves background for choosing appropriate language

ii) Increased capacity to expression of ideas [4mks]

g) Explain how reliability in programming language can be achieved through

i) Type checking

ii) Exceptional handling

iii) Readability and writ ability [2mks]

h) Describe language design trade-off [2mks]

i) Define the data abstraction [2mks]

j) What is an example of lack of orthogonally in the design of C [5mks]

Question #2 [20 Marks]

a) Compare and contrast procedural, functional, logical and object orientated programming language [6mks]

b) With the aid of a diagram describe the layered interface of virtual computers by a typical computer system [8mks]

c) Write a program of your own choice in two different programming languages clearly highlighting its characteristics [6mks]

Question #3[20 Marks]

a) With the aid of a diagram, explain the influence of computer architecture on language design [6mks]

b) Describe the markup/programming hybrid languages [4mks]

c) Using a program code of your own choice, write a program to highlight three types of abstraction [10mks]

Question #4[20 Marks]

a) Describe the four methodologies and their respective abstraction concepts [8mks]

b) What are the different grammar symbol for formal language [2mks]

c) Describe briefly the three approaches to build a lexical analyser [4mks]

d) Why are named constants used, rather than numbers, for token codes [2mks]

e) What are the character classes used, rather than individual characters, for the letter and digit transition of a state diagram for a lexical analyser [4mks]

Question #5[20 Marks]

a) Consider the following problem:

I need to calculate my fees balance after paying a sum of ksh.50,000. A transaction rate of 0.5% is applied to the fees. One has to calculate the rate subtract it from the amount paid and then subtract this new value from the school invoice. Assuming my invoice is currently at ksh. 150,000:

i) Explain how this will be achieved by second generation language [8mks]
ii) Explain how this will be achieved by third generation language [6mks]
iii) Explain how this will be achieved by 4^{th} generation language [6mks]