



KENYATTA UNIVERSITY
EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE INFORMATION
TECHNOLOGY

SIT 104: VISUAL PROGRAMMING

2ND SEMESTER 2023/2024

TIME: 2 HOURS

INSTRUCTIONS:

- i. This paper consists of **FIVE** questions
 - ii. Question **ONE** is compulsory and contains 30 marks
 - iii. Attempt any **TWO** of the remaining four questions. Each question is 20 marks
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QUESTION 1(30 MARKS)

- (a) Define the term object and outline main aspects of it.
[3 marks]
- (b) Discuss the following terms as used in programming.
 - i. Class
 - ii. Encapsulation
 - iii. Abstraction .[6 marks]
- (c) Briefly explain the term component in programming and explain any two risks of using them in software development.
[5 marks]
- (d) Design a form for computing sensitiveness of governor using formula below .Write a code to display result on a textbox.

- The governor is said to be sensitive when it readily responds to a small change of speed.
- Sensitiveness of a governor is defined as the ratio of difference between the maximum and minimum speeds to the mean equilibrium speed.

$$\text{Sensitiveness} = \frac{\text{range of speed}}{\text{mean speed}}$$

$$= 2 \frac{(N_2 - N_1)}{N_1 + N_2}$$

where, N = mean speed

N_1 = minimum speed corresponding to full load conditions

N_2 = maximum speed corresponding to no load conditions.

- (e) Discuss any three ways of enhancing write ability in a graphical user interface. [5 marks]
- (f) Write a program in VB.net that list radius of sphere from 1 mm to 30 mm, surface area and corresponding volume. Values should be displayed in DataGridView [6 marks]
- [5 marks]

QUESTION 2

- (a) Briefly explain structure of vb.net program. [4 marks]
- (b) Discuss any three reasons why a programmer would prefer coding command line interface instead of graphical user interface. [6 marks]
- (c) Discuss any three tools that enhance writability in an application . [3 marks]
- (d) Brinell hardness number is calculated using the formula below

$$HB = \frac{\text{Load (kgf)}}{\text{Surface Area of Indentation (mm}^2\text{)}} = \frac{P}{\frac{\pi D}{2} (D - \sqrt{D^2 - d^2})}$$

where D : Diameter of the ball indenter,

d : Diameter at the rim of the permanent impression,

P : Load.

Design a graphical user interface form to compute HB. Write a program that will display Brinell hardness in a textbox when user click ok button.

[7 marks]

QUESTION 3

- (a) Explain use of access modifiers in computer programs. [3 marks]
- (b) Discuss multitier software architecture. State any two advantages of such approach. [6 marks]

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- (c) Briefly explain the term application programming interface (API). State application of API in software development [5 marks]
- (d) Strain energy due to pure shear is calculated using formula below

$$U = \tau^2 V / (2G)$$

Where,

τ = Shear Stress

G = Shear modulus or Modulus of rigidity

V = Volume of the material.

Design a form for displaying various values of strain energy for shear stresses between some set of values. Write a code to active operation and also refresh data grid view [6 marks]

QUESTION 4

- (a) Outline how user program stores data persistently in a computer. Explain how this is achieved. [4 marks]
- (b) Write a code snippet to handle connection to none existence file. [4 marks]
- (c) Briefly explain how polymorphism concept is implemented in window forms. [4 marks]
- (d) Briefly explain the term software architecture; Explain how layered architecture enhance application maintenance. [6 marks]

QUESTION 5

- (a) Discuss any three ways of enhancing user interface for physically challenged users. [6 marks]
- (b) Differentiate between
i. SDI and MDI
ii. File and database and give any two-application using such. [8 marks]
- (c) Discuss general structure of a MessageBox dialogue and write a code that displays your registration no and the course you are enrolled for as its title in an authoritative way. [6 marks]

*****END OF EXAMINATION*****