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UNIVERSITY EXAMINATIONS 2023/2024

SECOND YEAR, SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

CIT 3252: APPLICATION PROGRAMMING

DATE: APRIL 2024 **TIME: 2 HOURS**

INSTRUCTIONS: Answer Question ONE and any other TWO questions.

QUESTION ONE (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

$N1$ = minimum speed corresponding to full load conditions

$N2$ = maximum speed corresponding to no load conditions.

[5 Marks]

e) Discuss any three ways of enhancing write ability in a graphical user interface. [6 Marks]

f) Write a program in C#.net that list radius of sphere from 1 mm to 30 mml, surface area and corresponding volume. Values should be displayed in DataGrid view [5 Marks]

QUESTION TWO (20 MARKS)

(a) Briefly explain structure of c#,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 readability in an application. [3 Marks]

(d) Brinell hardness number is calculated using the formula below

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

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 THREE (20 MARKS)

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]

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 = ShearStress

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 FOUR (20 MARKS)

(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 database 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 FIVE (20 MARKS)

a) Discuss any three ways of enhancing user interface for physically challenged user

[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 Message box 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]