

BINDURA UNIVERSITY OF SCIENCE EDUCATION
FACULTY OF SCIENCE AND ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE
BSc HONS DEGREE IN SOFTWARE ENGINEERING
SWE202: SOFTWARE ARCHITECTURE AND DESIGN

2 HOURS 30 MINUTES

INSTRUCTIONS FOR CANDIDATES

Answer **all** questions

Total marks: 100

NOV 2023

Question 1

- a. Explain the following terms
 - i. Test driven development [2]
 - ii. Load balancing [2]
 - iii. Software architecture [2]
 - iv. Software design [2]
- b. State any three differences between libraries and APIs [6]
- c. List any three similarities between libraries and frameworks [6]

Question 2

With the aid of examples where possible, explain the following software design principles

- a. Divide and conquer [4]
- b. Increasing Cohesive [4]
- c. Reducing coupling [4]
- d. Increase abstraction [4]
- e. Increase reusability [4]

Question 3

Bindura University of Science Education has made a decision to ensure that all the courses are available online towards the goal of having three times the number of students they have been recruiting in the past years. Some of the courses have lots of video content. As an engineer you have been asked to explain to the Vice Chancellor how the following can help make the Bindura University of Science Education's mission possible.

- a. Elasticity [5]
- b. Clustering [5]
- c. Testability [5]
- d. Maintainability [5]

Question 4

- a. Differentiate Data-centric style from Layered style. [4]
- b. Using any programming language of your choice implement examples for the following
 - i. Singleton design pattern [4]
 - ii. Decorator design pattern [4]
- c. Describe scenarios in which you should use
 - i. Websockets [4]
 - ii. HTTP requests [4]

Question 5

- a. The usage of state and behavior patterns has increased significantly in libraries and frameworks. Using examples, give a detailed description on how these two patterns are being used. [12]
- b. Explain any four advantages of using graphql over REST services. [8]

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