Birla Institute of Technology & Science, Pilani
Work Integrated Learning Programmes Division
First Semester 2022-2023

Mid-Semester Test
(EC-2 Regular)

Course No.	: SE ZG585
Course Title	: Cross-Platform Application Development
Nature of Exam	: Open Book
Weightage	: 30%
Duration	: 2 Hours
Date of Exam	: 23/09/2022 (FN)

No. of Pages = 2
No. of Questions = 4

Note to Students:
1. Please follow all the *Instructions to Candidates* given on the cover page of the answer book.
2. All parts of a question should be answered consecutively. Each answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

Q.1 Answer in brief: **[2 * 3 = 6]**

(a) Explain with an example, relationship between microservices, Docker and kubernetes.

(b) Consider a case of composite pattern - where an application fetches data from different APIs. For example, a dashboard that retrieves the required data from different sources such as logging services APIs, cloud based backends for consumption numbers, third-party analytics services to capture end-user interactions etc. Which type of API design style will be suitable for this scenario? Justify?

Ans:

Rest api – with api gateway

(c) Serverless computing can be thought of as no servers instead of less servers. Justify/Invalidate.

Ans:

Invalid -

Baas (Firebase- business + storing data) nd Faas (Azure function app, logic app)

Q.2 Rishikesh is an enthusiastic traveler. When travelling he uses his DSLR camera a lot to capture the pictures of the surroundings. Also he uses these pictures in blogposts which narrates his journeys and experiences of the places which he has visited in the past. As his blogs are very informative, many readers find them quite useful when they plan their journeys to those places, hence many feedbacks are also shared by the readers.

Answer the following sub-questions based on the above narrative: **[2 + 2 + 2 = 6]**

(a) What type of data is captured in this narrative?

Ans:

Image – Azure blob storage, AWS s3

Text – Mongodb, sql server

(b) Whether a file based system will be appropriate choice for such type of data? Why?

Ans:

No,
Azure Blob storage, AWS s3

(c) What other type of data storage will be suitable for such type of data? Justify with example.

Ans:

Cloud based object storage system
Azure Blob storage, AWS s3, Google cloud storage

Q.3 Let's assume that you need to design a mobile app for English language dictionary. It should serve as English language learning tool and provide word games built for every level of learner.
With trusted definitions and synonyms plus word puzzles, language quizzes, and spelling quizzes, this English dictionary and thesaurus app for Android should be optimized with your mobile device in mind to help you learn English or improve your English vocabulary. In addition to the trusted reference content from Dictionary.com and Thesaurus.com, this education app should include:

- Word Puzzle ► To Improve your vocabulary with fun spelling quizzes and vocabulary challenges.
- Word of the Day ► Learn a new word each day and expand your vocabulary education.
- Synonyms ► Get thesaurus content alongside your dictionary definitions.
- Audio pronunciations ► Never mispronounce another word.
- Voice search ► Find the definitions you're looking for anywhere, anytime. The app even offers up English spelling help. Not sure how a word is spelled? Say it out loud, and this app will find it for you.
- Grammar help ► Get grammar tips, word usage, and more to improve your writing.
- Favorite words and search history ► Customize your recently searched word list, and never forget the newest words you've learned
- Learner's dictionary ► Includes extra information about word usage for English learners

Answer the following sub questions based on this scenario: **[2 + 2 + 1 + 2 + 2 + 1 = 10]**

a) What will be the type of mobile dictionary application? Justify briefly.

Ans:
Native (object C, swift for IOS, Kotlin Java for Andriod)

or Hybrid mobile application (on React Native or Flutter)

b) What features of the mobile phone will be leveraged by this dictionary application?
Ans:
Voice search, audio pronunciations, and offline functionality

c) What framework and programming language will be suitable for development of this type of application?
Ans:
Native (object C, swift for IOS, Kotlin Java for Andriod)

d) If this application needs to work in offline manner, then using a file for storing dictionary data will be an appropriate choice? Justify.
Ans:
No
Database – sql lite (offline), mongo (online)

e) Every day when user first time opens up the application, a new "word of day" needs to be shown to him. Describe the factors that you will consider while designing this feature?
Ans:
1. Data Source: The first factor to consider when designing this feature is the data source. It is important to identify the data source that will provide new words each day. This could be an online dictionary, an online thesaurus, or a database of words.
2. Word Difficulty: The second factor to consider is the difficulty of the word. Depending on the target audience, the word difficulty should be tailored accordingly. For example, if the target audience is children, the word difficulty should not be too high.
3. Word Relevance: The third factor to consider is the relevance of the word to the target audience. The word should be relevant to the target audience's interests, needs, and/or experience.
4. Word Variety: The fourth factor to consider is the variety of words. In order to keep the feature engaging, it is important to provide a variety of words from different topics.
5. Word Frequency: The fifth factor to consider is the frequency of the words. It is important to ensure that the same words are not repeated too often.
6. Word Support: The sixth factor to consider is the support for the words. It is important to provide

f) Whether using any Backend-as-a-Service (BaaS) for dictionary app will make any difference?
Ans:
Yes it make difference,
If we using online mode then it would be recommend for BaaS

Q.4 For the below mentioned cases, identify a suitable architectural style (discussed in the class) and provide an architectural block diagram and short description narrating the request-response flow between various components involved. **[8]**

a) Yours is a unified payment interface that enables transfer of money from one bank account to another account and also has plans in mind to extend it for transfer of money between bank account and credit cards.

Ans:
Client – server architecture

b) Yours is credit score management system that tracks the loans taken by the customer and updates the credit score on regular basis when an EMI is paid by the customer

Ans:
Event based Arch

c) Yours is a business that wants to adapt mobile-only application for supporting the business transactions and does not want to take headache associated with management and maintenance of infrastructure required for the application
Ans:
Serverless Arch

and MBaaS

d) You quickly need to build a prototype of the product before embarking on a more ambitious project, its less complex in nature and the team has expertise into conventional development and deployment approaches

Ans:

Monolithic application

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