Nirma University

Institute of Technology

Semester End Examination (IR), December 2019

B.Tech in Information Technology, Semester: VII

IT707: Microservice Architecture and Programming

Roll/ Exam No | | Supervisor's initial with date | |

Time : 3 Hours | Max Marks: 100

Instructions :
1. Attempt all questions.
2. Figures to right indicate full marks.
3. Draw neat sketches wherever necessary.
4. Assume necessary data wherever required.

SECTION-I

Q.1 **Answer the following.** **[16]**

A CO3BL3 With suitable example demonstrate how API gateway makes life of the client (like mobile app) easy which is going to use MSA based large scale application. (06)

B CO1BL1 How materialized views in CQRS pattern can be helpful in micro-service based applications? (04)

C CO3BL3 Write conceptual code for JMS producer and consumer service for messaging system based application where producer sends message in the topic "Testing AMQ" and consumer consumes the message arriving in the same topic. (06)

Q.2 **Do as directed.** **[20]**

A CO2BL3 1. Compare CRUD operations based data management with event sourcing based data management. (04)

2. How Message Durability and Persistence is addressed in JMS? (04)

B CO3BL4 Demonstrate with example the difference between Topic and Queue based messaging architecture used for asynchronous communication in MSA. (06)

C CO2BL3 Demonstrate with example the need of compensating transaction when a distributed transaction is spanning over multiple microservices in an application based on MSA. (06)

OR

C CO2BL3 Identify three use-cases of CQRS pattern where it can be the best possible solution for the given problem. (06)

Q.3 **Answer the following.** **[14]**

A CO1BL2 1. Compare the calling types supported by gRPC based application. (04)

2. Compare Websockets and REST based communication approaches. (04)

B CO3BL3 With an example show how an event-store can work as database as well as it can also work as a message broker. (06)

OR

B CO3BL4	Write gRPC service definition including required message definition also for the application which allows client to get the current location of server as well server allows client to get its current location. Here client and server both can be considered running in mobile devices.	(06)

SECTION-II

Q.4 Do as directed. **[18]**

A CO2BL4	Identify a scenario in microservice(s) communication, where circuit breaker plays an important role. Illustrate its states and its working.	(10)
B CO1BL2	Even if SOA is available, but still the developers want to make use of microservices. What are the reasons behind this?	(04)
C CO1BL2	Why the Full Stack Developer profile can be the best match for MSA based application development team?	(04)

Q.5 Answer the following. **[20]**

A CO1BL3	How Containers are better than Virtual machines with respect to deploying the microservices in distributed scenarios? Justify the same using example.	(07)
B CO2BL3	Mention the importance of serverless architecture pattern: The read heavy reporting engine. How caching data and index tables are associated with this?	(06)

OR

B CO2BL3	Conceptually define serverless computing. How this will remove the management of underlying infrastructure? How LAMBDA function can be triggered?	(06)
C CO1BL2	How Entity, Value Object, Factory, Repository and Service acts as a building blocks for Domain Driven Design (DDD)? Also state the significance of bounded context with respect to DDD.	(07)

Q.6 Do as directed. **[12]**

A CO3BL2	DevOps and Microservices go hand in hand, justify the statement. How Continuous Integration and Continuous Delivery are mapped to DevOps methodologies?	(05)
B CO3BL3	Justify the need for monitoring of the microservices. How SLA (Service Level Agreement) are associated with the microservices?	(07)

OR

B CO3BL2	Discuss the importance of OAuth 2.0 for microservices. Also Mention its protocol flow.	(07)