JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- APRIL-2023

COURSE CODE(CREDITS): 19B1WCI635(2)

COURSE NAME: Architecting Distributed Cloud Application

COURSE INSTRUCTORS: Dr.Rajni Mohana , Dr. Jagpreet Sidhu

MAX. TIME: 1 Hour 30 Minutes

MAX. MARKS: 25

Note: *All questions are compulsory. Marks are indicated against each question in square brackets.*

1) a) Outline some strategies for preventing service instance failure due to force majeure events such as data center outages or hardware failures. [5 marks CO2,CO4]

    b) Discuss how running multiple instances of services and replicating data can help prevent service instance failure.

2) What are some reasons for splitting a monolithic application into micro services? Discuss how micro services architecture can improve scalability, flexibility, resilience, and maintenance compared to a monolithic architecture. [5 marks CO1,CO3]

3) Discuss why the request/reply pattern may not be the best approach for communication between a client and a service instance. Explain how messaging communication can be a better alternative, highlighting its benefits such as improved resource efficiency, resilience, and elasticity. [5 marks CO2,CO4]

4) Discuss the importance of versioning in API design and the need for backward compatibility. Explain the potential issue that can arise during rolling updates when new and old service instances run together, resulting in failures if version mismatches occur. [5 marks CO3,CO4]

5) Highlight the benefits of using a leader to conserve resources by reducing the chance of work being done by multiple service instances. Discuss the potential problem of leader failure and the need to quickly elect a new leader using fault-tolerant algorithms that are difficult to implement. [5 marks CO3,CO4]