Name: **Enrolment No:**	

UPES

End Semester Examination, December 2023

Course: Microservices & Containerization **Semester: V**

Program: BCA (IOT/CS/AIML) **Time : 03 hrs.**

Course Code: CSBC3020P **Max. Marks: 100**

Instructions: 1) All the questions are compulsory.

2) An internal choice has been provided in Question 9 and Question 11.

SECTION A

(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Define Service-Oriented Architecture (SOA) and Microservices.	**4**	**CO1**
Q 2	Explain the difference between virtualization and containerization with suitable example.	**4**	**CO2**
Q 3	Describe the concept of docker image.	**4**	**CO3**
Q 4	Discuss some fundamental security considerations when developing microservices.	**4**	**CO3**
Q 5	Define orchestration in the context of containerized applications.	**4**	**CO4**
	SECTION B **(4Qx10M= 40 Marks)**		
Q 6	Describe Docker Swarm and highlight its role in container orchestration with example.	**10**	**CO3**
Q 7	Illustrate the role of Docker in containerization. What are Docker containers, and how do they simplify the packaging and deployment of applications?	**10**	**CO4**
Q 8	Explain the advantages of using microservices in software development. Provide examples of scenarios where microservices are particularly beneficial.	**10**	**CO2**
Q 9	Compare and contrast container orchestration tools such as Kubernetes and Docker Swarm with suitable example. OR Analyze and discuss the container orchestration tools that contribute to the scalability and reliability of microservices-based applications.	**10**	**CO4** **CO4**

SECTION-C (2Qx20M=40 Marks)			
Q 10	Elaborate on Docker volume and Docker networking. Explain the default networking behavior in Docker and the various networking modes available.	**20**	**CO3**
Q 11	Outline the steps involved in deploying and managing services on Docker Swarm. Include key commands and concepts used in the process. OR Explain key security considerations specific to containerized environments. How can vulnerabilities be mitigated, and what best practices should be followed?	**20**	**CO2** **CO4**