Name: Enrolment No:	

UPES
End Semester Examination, May 2025

Course: Container Orchestration and Automation Semester: VI
Program: BTECH-CSE Time : 03 hrs.
Course Code: CSVT3026 Max. Marks: 100

Instructions: Please attempt according to the time provided and given weightage.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	A container is crashing immediately after start. How would you investigate the issue using Docker CLI commands? Provide a minimum of 2 commands(upto 2 marks) along with an explanation (upto 2 marks).	4	CO1
Q 2	A service defined in docker-compose.yml is not starting. What two Docker Compose CLI commands would you use to diagnose the issue (upto 2 marks), and what information does each provide (upto 2 marks)?	4	CO3, CO4
Q 3	You are given a frontend (React app) and a backend (Node.js API) that need to communicate over a private Docker network. Write a docker-compose.yml file that defines both services such that they: • Run on the same custom bridge network • Use named services so the frontend can call the backend via DNS (e.g., http://backend:5000) • Use image names my-frontend and my-backend respectively	4	CO2
Q 4	Briefly explain two of the following cloud service models. Make sure to write out the full form of each abbreviation: IaaS, PaaS, SaaS. For each model, include: • What the model provides • One real-world example	4	CO1
Q 5	What is the purpose of the ".dockerignore" file in a Docker project? Provide two specific examples of files or folders you would typically include in ".dockerignore", and briefly explain why.	4	CO2

SECTION B
(4Qx10M= 40 Marks)

Q 6	What is Docker (upto 2 marks)? Explain its architecture with a Diagram (4 marks)? What are the key components of Docker architecture (upto 4 marks)?	10	CO1
Q 7	Explain the Docker Swarm architecture also with a diagram(upto 5 marks). Explain the key conmponents(upto 5 marks).	10	CO3

Q 8	Compare in a tabular format between Docker Swarm vs Kubernetes vs Apache Mesos containing a minimum of 10 different points(upto 10 marks)	10	CO3, CO4
Q 9	Compare between virtualization vs Docker containerization(upto 5 marks). Explain the idea of virutalization an application using Docker with an example dockerfile(upto 5 marks). **Or** Explain what a YAML file and its key features (upto 2 marks). What are the valid entries that an YAML file can contain (upto 2 marks). Give an example of a YAML file used in docker-compose (upto 3 marks). List four other use cases of YAML other than docker-compose (upto 3 marks).	10	CO1, CO4

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SECTION-C
(2Qx20M=40 Marks)
Question 11 has an internal choice. Always answer in bullet points and not as paragraphs.

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Q 10	What is Continuous delivery (upto 4 marks)? Explain also with a diagram the CI/CD pipeline along with its benefits (upto 4 marks). Explain DevOPS culture and its principles (upto 4 marks). Explain the ideas mentioned in CALMS (upto 4 marks). Represent the DevOPS lifecyle diagrammatically (upto 4 marks).	20	CO3, CO4
Q 11	A) What is Microservices (upto 4 marks)? Represent this architecture diagrammatically(upto 8 marks). How does Docker support the microservices architecture? Explain this also with a diagram using the k8 architecture(upto 8 marks). **(OR)** B) Explain the concept of Docker Bakery also with a diagram(upto 10 marks) and an example using either nodejs or python or of an operating system(upto 5 marks). Explain the best practices of Docker Bakery(upto 5 marks).	20	CO2, CO3