Unit-1

1. What is MLOps, and what motivates its adoption in modern organizations?

2. Describe the key components of MLOps. How do these components work together to create an effective machine learning operations pipeline?

3. Explain the different roles involved in MLOps. Discuss how collaboration between these roles is essential for the successful implementation of MLOps in an organization.

4. Compare and contrast MLOps with DevOps. How does MLOps extend the principles of DevOps to address the specific needs of machine learning workflows?

5. Outline the machine learning lifecycle and its phases. How does MLOps support each phase of this lifecycle, from data collection to model deployment and monitoring?

6. Discuss the major phases involved in mastering MLOps. What skills and knowledge are required at each phase, and how do they contribute to successful machine learning operations?

7. What are some of the most commonly used tools in MLOps? Provide examples of how these tools are used to automate and streamline various aspects of the MLOps pipeline.

8. Explain the MLOps Maturity Model Levels. How can organizations assess their current MLOps maturity level, and what steps can they take to progress to higher levels of maturity?

9. Describe the stages of CI/CD in the context of MLOps. How do these stages differ from traditional software CI/CD pipelines, and what additional considerations must be made for machine learning models?

10. What are the future trends in MLOps, and how might they shape the evolution of machine learning operations? Discuss potential advancements in MLOps practices, tools, and methodologies.

Unit-2

1. Explain the process of collecting, labelling, and validating data for a machine learning project.
2. Describe feature engineering in the context of TensorFlow Extended (TFX).
3. What strategies can be employed to address class imbalances in a dataset?
4. Discuss the importance of understanding the data journey over a production system's lifecycle.
5. Compare and contrast labelled and unlabeled data in the context of machine learning.

6. Explain the significance of data augmentation in diversifying a training set.
7. Describe how TensorFlow Extended can be used to implement data transformation and selection.
8. How can enterprise schemas be utilized to address quickly evolving data in a machine learning system?
9. What role does ML metadata play in the production lifecycle of a machine learning system?
10. Discuss the ethical considerations involved in the data collection and labelling process.

Unit-3 & 4

1. What are the key considerations for deploying a machine-learning model into a runtime environment?
2. Explain the importance of data access before validating and launching an ML model into production.
3. Describe the process of model risk evaluation before deploying a machine learning model.
4. Discuss the concepts of reproducibility and audibility in the context of quality assurance for machine learning models.
5. Explain the security challenges associated with machine learning systems.
6. Provide an introduction to FLASK API and MLFlow. How can these tools be used to streamline the deployment of machine learning models and manage their lifecycle?
7. What are CI/CD pipelines, and how do they apply to machine learning deployment? Discuss the benefits of integrating CI/CD practices into ML workflows and the challenges involved.
8. Describe the components of an ML artefact. What role do these artefacts play in the deployment pipeline, and how do they contribute to the model's successful deployment?
9. Compare and contrast different model deployment strategies. What factors should be considered when choosing a deployment strategy, and how do these strategies differ in terms of scalability and maintenance?
10. Discuss the role of containerization in scaling ML deployments. What are the benefits of using containers for ML models, and what challenges might arise when scaling deployments in a production environment?

Unit-5

1. Discuss the roles and responsibilities of different stakeholders in shaping governance policies for machine learning operations (MLOps).

2. Explain how governance practices should be matched with the risk level of an organization's machine learning operations.

3. What are some of the current regulations driving MLOps governance? Discuss how these regulations influence the development, deployment, and monitoring of machine learning models.

4. Describe the concept of Responsible AI. Why has it become increasingly important in the development and deployment of machine learning models?

5. Discuss the key elements of Responsible AI. How can organizations implement these elements to ensure that their AI systems are ethical, transparent, and fair?

6. How can the emergence of Responsible AI impact an organization's governance strategy?
7. What role do regulatory bodies play in shaping MLOps governance? Provide examples of how external regulations can enforce governance practices within an organization.

8. Explain the relationship between risk management and MLOps governance. How can organizations balance the need for innovation with the requirement to manage risks effectively?

9. Discuss the challenges that organizations face in implementing Responsible AI. What steps can be taken to overcome these challenges and ensure that AI systems are aligned with ethical standards?

10. How can organizations ensure compliance with both internal governance policies and external regulations? Discuss the importance of continuous monitoring and adaptation in maintaining governance standards in MLOps.