



**SIDDHARTHA INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**

Siddhartha Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code: AI-DRIVEN SOFTWARE ENGINEERING & DEVOPS (23CS0932)

Course & Branch: B.Tech- CSM&CAI

Regulation: R23

Year & Sem: III-B.Tech & I-Sem

UNIT – I

Foundations of AI in Software Engineering

1	a)	What is AI-driven Software Development?	[L1][CO1]	[2M]
	b)	Mention any two software lifecycle phases where AI can be applied	[L1][CO1]	[2M]
	c)	Define Deep Learning	[L1][CO1]	[2M]
	d)	What is meant by “learning from code”?	[L1][CO1]	[2M]
	e)	What is a Software Knowledge Graph?	[L1][CO1]	[2M]
2	a)	Differentiate between Traditional Software Development and AI-driven Software Development.	[L2][CO1]	[5M]
	b)	Explain the opportunities of Artificial Intelligence in different phases of the Software Development Life Cycle (SDLC).	[L4][CO1]	[5M]
3	a)	What is code representation?	[L5][CO1]	[5M]
	b)	Describe the role of Natural Language Processing (NLP) in source code understanding and software maintenance.	[L1][CO1]	[5M]
4		Explain the role of Artificial Intelligence across different phases of the Software Development Life Cycle (SDLC).	[L6][CO1]	[10M]
5		Describe Machine Learning (ML) and Deep Learning (DL) models used in software engineering tasks.	[L4][CO1]	[10M]
6	a)	What are datasets and benchmarks in Software Engineering AI? Why are they important?	[L3][CO1]	[5M]
	b)	Discuss the features and benefits of AI-enhanced software development tools.	[L4][CO1]	[5M]
7	a)	Explain the concept of Learning from Code with suitable examples.	[L4][CO1]	[5M]
	b)	Describe the applications of Machine Learning and Deep Learning models in software engineering.	[L2][CO1]	[5M]
8		Analyse the working and benefits of AI-enhanced software development tools.	[L2][CO1]	[10M]
9		Design an AI-based framework for automated bug detection and explain its workflow	[L3][CO1]	[10M]
10		Examine the challenges of training AI models on source code repositories and propose suitable solutions	[L4][CO1]	[10M]

UNIT – II**AI in Code Generation and Refactoring**

1	a)	Define Code Completion in software development.	[L1][CO2]	[2M]
	b)	What is a Large Language Model (LLM)?	[L1][CO2]	[2M]
	c)	Name any two AI models used for code generation.	[L1][CO2]	[2M]
	d)	What is Code Clone Detection?	[L1][CO2]	[2M]
	e)	Define Automated Refactoring.	[L1][CO2]	[2M]
2	a)	Explain the concept of source code embeddings and their applications in software engineering tasks	[L2][CO2]	[5M]
	b)	Discuss the role of AI in Software Architecture Recommendations with suitable examples	[L3][CO2]	[5M]
3	a)	What is Prompt Engineering? Explain its significance in software development tasks using AI tools.	[L2][CO2]	[5M]
	b)	Compare Codex and CodeBERT with respect to architecture, functionality, and software engineering applications	[L4][CO2]	[5M]
4		Discuss the role of AI in Software Architecture Recommendations. Explain how AI assists architects in making design decisions.	[L2][CO2]	[10M]
5		Discuss Prompt Engineering strategies for software engineering tasks such as code generation, testing, debugging, and documentation	[L4][CO2]	[10M]
6	a)	Describe the process of automated refactoring	[L3][CO2]	[5M]
	b)	Explain its benefits in maintaining software quality.	[L4][CO2]	[5M]
7	a)	Discuss the benefits of Automated Refactoring using AI techniques.	[L5][CO2]	[5M]
	b)	Explain how Machine Learning techniques can be used for Bug Detection in software systems.	[L4][CO2]	[5M]
8	a)	Describe the concept of Code Smells and their impact on software maintainability.	[L5][CO2]	[5M]
	b)	Explain the need for reliability and safety mechanisms in AI-generated code.	[L4][CO2]	[5M]
9	a)	Describe the concept of Program Synthesis and its significance in software development.	[L6][CO2]	[5M]
	b)	Explain different types of code clones and the importance of code clone detection.	[L6][CO2]	[5M]
10		Analyze the challenges related to Reliability, Security, and Safety in AI-generated code	[L3][CO2]	[10M]

UNIT – III**Intelligent Testing, QA, and Debugging**

1	a)	What is AI-based test case generation?	[L1][CO3]	[2M]
	b)	Define automated unit testing.	[L1][CO3]	[2M]
	c)	What is regression testing in software engineering?	[L1][CO3]	[2M]
	d)	How can Machine Learning improve regression testing?	[L1][CO3]	[2M]
	e)	What is fault localization?	[L1][CO3]	[2M]
2	a)	Explain the concept of AI-based test case generation and its advantages over manual test case creation.	[L2][CO3]	[5M]
	b)	Discuss the role of Artificial Intelligence in automated unit testing with suitable examples.	[L2][CO3]	[5M]
3		Describe the architecture and workflow of an automated unit testing system powered by Artificial Intelligence. Illustrate with suitable examples.	[L4][CO3]	[5M]
4		Compare and contrast AI-based static code analysis and dynamic code analysis. Discuss their strengths, limitations, and applications.	[L2][CO3]	[5M]
5	a)	Describe how Machine Learning techniques can be applied to regression testing	[L2][CO3]	[5M]
	b)	Explain the process of learning bug patterns from software repositories and its benefits	[L2][CO3]	[5M]
6		Explain the process of automated debugging using Artificial Intelligence.	[L3][CO3]	[10M]
7		Describe AI-enhanced Quality Assurance metrics	[L4][CO3]	[10M]
8		Discuss Reinforcement Learning for test prioritization in detail.	[L6][CO3]	[10M]
9		Examine the ethical issues and biases associated with AI-driven testing systems	[L3][CO3]	[10M]
10		Discuss fault localization techniques in software engineering	[L6][CO3]	[10M]
11		Explain how software repositories can be mined to learn bug patterns	[L3][CO3]	[10M]

UNIT-IV
AI in DevOps Automation and CI/CD

1	a)	Define DevOps and mention its primary objectives.	[L1][CO4]	[2M]
	b)	What is the role of AI in DevOps?	[L1][CO4]	[2M]
	c)	Define Continuous Integration (CI) and Continuous Deployment (CD).	[L1][CO4]	[2M]
	d)	What is a predictive build failure model?	[L1][CO4]	[2M]
	e)	What is log analysis in DevOps?	[L1][CO4]	[2M]
2	a)	Explain the fundamentals of DevOps and its benefits in modern software development.	[L2][CO4]	[5M]
	b)	Describe how Artificial Intelligence can be integrated into DevOps practices to improve software delivery	[L3][CO4]	[5M]
3	a)	Explain the architecture and working of an Intelligent CI/CD pipeline.	[L2][CO4]	[5M]
	b)	Discuss the concept of predictive build failure analysis and its advantages in software projects.	[L6][CO4]	[5M]
4	a)	Explain the role of AI in log analysis and anomaly detection in production environments.	[L3][CO4]	[5M]
	b)	Describe Infrastructure-as-Code (IaC) and explain how AI can enhance IaC management.	[L4][CO4]	[5M]
5	a)	Discuss the concept of self-healing systems and their significance in cloud-native applications.	[L4][CO4]	[5M]
	b)	Explain the key components and applications of AIOps in IT operations management.	[L6][CO4]	[5M]
6	a)	Describe how AI improves monitoring, tracing, and feedback loops in DevOps environments.	[L5][CO4]	[5M]
	b)	Explain the role of AI in DevSecOps for automating security testing and vulnerability detection.	[L5][CO4]	[5M]
7		Discuss the architecture, working principles, and advantages of self-healing systems	[L6][CO4]	[10M]
8		Explain the concept of AIOps in detail. Discuss its architecture, components, benefits, and real-world applications in IT operations.	[L6][CO4]	[10M]
9		Analyze the role of AI in monitoring, distributed tracing, and automated feedback loops.	[L6][CO4]	[10M]
10		Explain DevSecOps and discuss how AI-based security automation enhances vulnerability detection, threat prediction, compliance monitoring, and incident response.	[L4][CO4]	[10M]
11		Design an AI-powered DevOps framework for a large-scale cloud application	[L4][CO4]	[10M]

UNIT-V**Advanced Topics and Ethical Considerations**

1	a)	Define transparency in AI-driven development tools.	[L1][CO5]	[2M]
	b)	What is Human-AI collaboration in software teams?	[L1][CO5]	[2M]
	c)	What is autonomous code deployment?	[L1][CO5]	[2M]
	d)	Define technical debt.	[L1][CO6]	[2M]
	e)	What is AI-based technical debt prediction?	[L1][CO6]	[2M]
2	a)	Explain the importance of Explainability and Transparency in AI-driven software engineering tools.	[L6][CO5]	[5M]
	b)	Discuss the ethical issues associated with AI-assisted software development	[L2][CO5]	[5M]
3	a)	Explain the legal challenges involved in automated software engineering processes.	[L4][CO5]	[5M]
	b)	Describe the role of Human-AI Collaboration in improving software team productivity.	[L3][CO5]	[5M]
4	a)	Explain the risks associated with autonomous code deployment and suggest mitigation strategies	[L2][CO5]	[5M]
	b)	Discuss how AI can be used for technical debt prediction and management.	[L3][CO5]	[5M]
5	a)	Explain the concept of AI-based Developer Productivity Analytics with suitable examples.	[L4][CO6]	[5M]
	b)	Describe the latest research trends in Artificial Intelligence for Software Engineering (AI4SE).	[L4][CO6]	[5M]
6		Discuss the role of AI in Developer Productivity Analytics and explain the metrics, techniques, benefits, and limitations of AI-based productivity assessment systems.	[L6][CO6]	[10M]
7		Explain the concept of Human-AI Collaboration in software teams and its challenges	[L6][CO6]	[10M]
8		Design an AI-enabled Smart DevOps Workflow for a software organization.	[L6][CO6]	[10M]
9		Develop a case study-based framework illustrating how Explainable AI, Human-AI Collaboration, and Smart DevOps practices can be integrated to improve software quality and development efficiency.	[L6][CO6]	[10M]
10		Describe the concept of technical debt and explain how Artificial Intelligence can be used for its prediction, detection, prioritization, and management.	[L6][CO6]	[10M]
11	a)	Discuss the major challenges faced in the adoption of AI-driven software engineering solutions.	[L4][CO6]	[5M]
	b)	Explain the architecture and components of a Smart DevOps Workflow powered by AI.	[L4][CO6]	[5M]

Course Code: 23CS0932

R23