PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

PG DEGREE EXAMINATION DECEMBER 2025
(Third Semester)

TRANS DISCIPLINARY COURSE
(Common to PG Programmes)

DEVOPS METHODOLOGY AND TOOLS

Time: Three Hours   Maximum: 75 Marks

SECTION-A (10 Marks)
Answer ALL questions
ALL questions carry EQUAL marks   (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which tool is used for version control in DevOps? A. Docker B. Jenkins C. Git D. Kubernetes	K1	CO1
	2	Why is forking used in GitHub? A. To delete a repository B. To create a personal copy of someone else's repository C. To merge branches D. To view commit history	K2	CO1
2	3	What does POM stand for in Maven? A. Project Object Management B. Project Object Model C. Plugin Oriented Module D. Portable Object Management	K1	CO2
	4	In Maven, what is the correct sequence of the build lifecycle phases? A. compile → install → validate → test B. validate → compile → test → package → install → deploy C. deploy → compile → validate → test D. validate → package → compile → test	K2	CO2
3	5	Which of the following is used for user authentication in Jenkins? A. GitHub Tokens B. Jenkins' own database C. Maven settings D. Docker secrets	K1	CO3
	6	Why is Jenkins used in a DevOps pipeline? A. To design user interfaces B. To track bugs in code C. To automate the build and deployment process D. To write unit tests	K2	CO3
4	7	Where are plugins managed in Jenkins? A. Build pipeline B. User dashboard C. Plugin management section D. GitHub settings	K1	CO4
	8	Why pipeline integration with Git is considered important in Jenkins? A. It enhances server performance B. It allows automatic triggering of builds based on code changes C. It simplifies Jenkins installation D. It reduces memory usage	K2	CO4
5	9	Which component manages networking in Kubernetes? A. Docker Compose B. Jenkins Pipeline C. Kubernetes Services D. Maven Dependencies	K1	CO5
	10	Why are Replica Sets used in Kubernetes? A. To reduce memory usage B. To scale down applications C. To ensure desired number of pod replicas are running D. To connect services to the internet	K2	CO5

SECTION - B (35 Marks)
Answer ALL questions
ALL questions carry EQUAL Marks   (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Illustrate the DevOps Delivery Pipeline with a diagram and explain briefly in each stage.	K2	CO1
		(OR)		
	11.b.	Explain the difference between Git and GitHub. How do they work together in a typical version control process?	K2	
2	12.a.	Given a sample scenario where a Java project needs JUnit for testing, demonstrate how you would add the JUnit dependency to the pom.xml and explain its effect during the build process.	K3	CO3
		(OR)		
	12.b.	A developer is unsure whether Maven has added an external dependency properly. Show how you would verify that the dependency has been downloaded and is available in the local repository and the project classpath.	K3	
3	13.a.	Given the architecture of Jenkins, explain how you would set up a Jenkins environment for a small development team with limited resources. Include key components and justify your choices.	K3	CO3
		(OR)		
	13.b.	Assume a company needs to onboard multiple users to Jenkins. Illustrate the steps involved in setting up user accounts, enabling authentication, and implementing authorization using Jenkins' internal database.	K3	
4	14.a.	Analyze the components of a Jenkins pipeline. How do the stages, steps, and agents interact to achieve automation in the build process?	K4	CO4
		(OR)		
	14.b.	Break down the process of triggering an automated build in Jenkins through Git integration. What key elements must be correctly configured for this integration to function effectively?	K4	
5	15.a.	Analyze how the Kubernetes cluster architecture enables scalability and fault tolerance in distributed applications.	K4	CO5
		(OR)		
	15.b.	Illustrate and analyze the role of Kubernetes Services (ClusterIP, NodePort, LoadBalancer) in abstracting and managing network communication between Pods.	K4	

SECTION -C (30 Marks)
Answer ANY THREE questions
ALL questions carry EQUAL Marks   (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	DevOps is more than just tools—it's a cultural shift. Analyze this statement by examining the role of tools and mindset in successful DevOps implementation.	K4	CO1
2	17	Compare the roles of different Maven build lifecycle phases. Analyze how each phase contributes to the final outcome of the build process.	K4	CO2
3	18	Assume a company needs to onboard multiple users to Jenkins. Illustrate the steps involved in setting up user accounts, enabling authentication, and implementing authorization using Jenkins' internal database.	K4	CO3
4	19	Evaluate the importance of integrating Jenkins Pipelines with Git in a CI/CD workflow. Justify your answer with relevant scenarios.	K5	CO4
5	20	Critically evaluate the use of Replica Sets and Deployments in maintaining application availability and performance. What are the limitations, and how can they be mitigated?	K5	CO5

Z-Z-Z   END