**MANIPAL UNIVERSITY, MANIPAL**

**CDC 5051 Sessional and Assignment Questions**

**March-July 2021-22**

DevOps for Cloud Practical’s Modules for execution

Practical Exam

Practical Lab Assignment and Sessional Questions

**Practical Exam Instructions and Evaluation**

* **Each Group needs to complete/Implement following tasks as part of Practical Internals and Examination.**
* **Each group should select any Multi-Tier Web applications (Application Layer + Database Layer) developed using Python/Java/Nodejs/ASP.Net/PHP applications along with suitable databases.**
* **Each modules carries certain weightage and accordingly marks are allocated.**
* **Subset or at-least 3 modules need to be given demo by group as part of internal practical marks and assignment evaluation.**
* **Complete all modules and models need to be demonstrated during your final practical examination along with write-up given to questions on scheduled exam day.**
* **Viva-voice will be conducted to individual student on scheduled exam date.**

**Prerequisites:**

1. **Set up a GitHub Public Repo for your Applications.**
2. **Select a suitable Multi-Tier Web Applications implemented on any platform of your choice.**
3. **Prepare templates and scripts to deploy your environment and applications like Docker files, Docker-compose, Kubernetes deployment/service files and Ansible script for infrastructure deployment.**

**Following are the set of modules need to be implemented:**

1. Setup a Jenkins master and slave architecture environment.

Create Continuous Integration Build pipeline project for any Web applications using suitable build utilities to pull code from version control, build, validate, compile, test, install dependencies, package and deploy application on Slave node which serves as a Build Environment Servers.

1. Create Jenkins Continuous Delivery project to containerize any web application along with databases on a Docker hosted Jenkins Slave nodes (Docker Host should server as Build or Staging or Pre-Production Servers) and also ensure you push image of applications to user’s Docker hub repository
2. Create Jenkins Continuous Deployment project to deploy containerized application on Kubernetes cluster environment (Kubernetes Cluster should be your Production Environment)
3. Create Ansible playbook to create Build Server Environment or Docker Server Environment or Kubernetes Environment for the above Mentioned Modules. (**It will be good practice if you execute this as the First task and Complete the remaining Modules**)
4. Create Continuous Monitoring Services using Nagios to Monitor Jenkins slave nodes (Build Server) or Docker hosts (Pre-Production Servers) or Kubernetes cluster nodes (Production Servers) which host web servers and databases. (Example: Monitor CPU load, Disk space, RAM usage, Processes running, Apache server running status, mysql connection etc.)