Department of Artificial Intelligence and Machine Learning

Course Code: : 21AI54 Date : 20/03/2024

Semester : V Semester Marks : 50 M

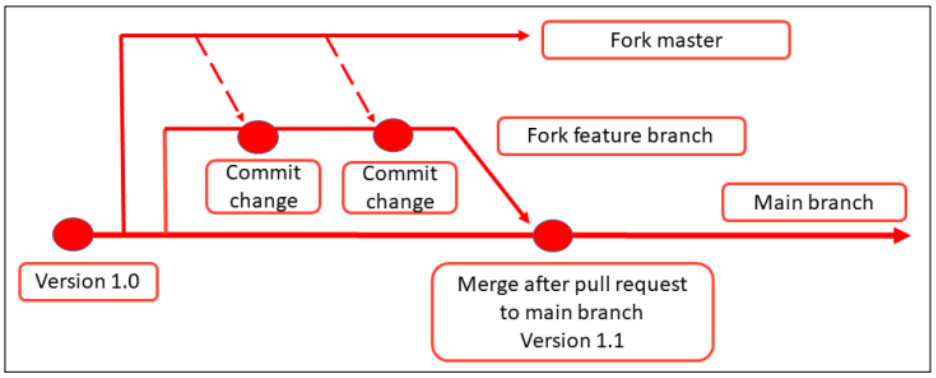
CLOUD COMPUTING AND ARCHITECTURES

CIE 3 / Improvement Test

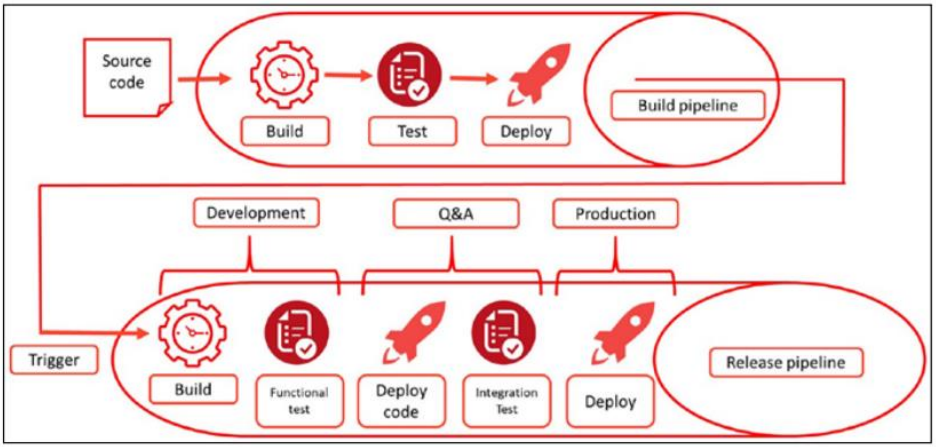
Scheme and Solutions

<table>
<tr><th colspan="2">SL. No</th><th>Questions</th><th>M</th><th>BT</th><th>CO</th></tr>
<tr><td rowspan="2">1</td><td>a</td><td>Define RAID? Compare Stripping and Mirroring in RAID
Define 1 m 3 Differences 3M
RAID (Redundant Arrays of Independent Disks)
Data redundancy, although taking up extra space, adds to disk reliability. This means, that in case of disk failure, if the same data is also backed up onto another disk
<table>
<tr><th>Features</th><th>RAID 0</th><th>RAID 1</th></tr>
<tr><td>Full Form</td><td>RAID is an abbreviation for the Redundant Array of Independent Disks level 0.</td><td>RAID 1 is an abbreviation for Redundant Array of Independent Disks level 1.</td></tr>
<tr><td>Basic</td><td>It utilizes disk stripping.</td><td>It utilizes disk mirroring.</td></tr>
<tr><td>Write Penalty</td><td>There is no written penalty.</td><td>It has a written penalty.</td></tr>
<tr><td>Cost</td><td>It is inexpensive.</td><td>It is more costly than RAID 0.</td></tr>
<tr><td>Read Performance</td><td>It has a better-read performance.</td><td>It has moderate reading performance.</td></tr>
<tr><td>Protection</td><td>There is no protection.</td><td>It offers mirror protection.</td></tr>
<tr><td>Storage Efficiency</td><td>The storage efficiency is 100%.</td><td>The storage efficiency is 50%.</td></tr>
<tr><td>Write Performance</td><td>It has a better-written performance than RAID 1.</td><td>It has a slower write performance than a single disk.</td></tr>
<tr><td>Emphasized</td><td>Its emphasis is on data accessing speed.</td><td>Its emphasis is on data availability.</td></tr>
</table></td><td>1+3+3</td><td>3</td><td>2</td></tr>
<tr><td>b</td><td>Write any three advantages of using RAID in cloud storage (Each Advantage Carries one marks)
Advantages of RAID
Data redundancy: By keeping numerous copies of the data on many disks, RAID can shield data from disk failures.
Performance enhancement: RAID can enhance performance by</td><td>3</td><td>1</td><td>2</td></tr>
</table>

		distributing data over several drives, enabling the simultaneous execution of several read/write operations. **Scalability:** RAID is scalable, therefore by adding more disks to the array, the storage capacity may be expanded. **Versatility:** RAID is applicable to a wide range of devices, such as workstations, servers, and personal PCs			
2	a	**Briefly explain the DevOps Agile Skills Association (DASA) principles (Explain Any Five Principles)** **1. Customer-centric action:** Develop an application with the customer in mind: what do they need and what does the customer expect in terms of functionality? This is also the goal of another concept, domain-driven design, which contains good practices for designing. **2. Create with the end in mind:** How will the application look when it's completely finished? **3. End-to-end responsibility:** Teams need to be motivated and enabled to take responsibility from the start to the finish of the application life cycle. This results in mottos such as you build it, you run it and you break it, you fix it. One more to add is you destroy it, you rebuild it better. **4. Cross-functional autonomous teams:** Teams need to be able and allowed to make decisions themselves in the development process. **5. Continuous improvement:** This must be the goal—to constantly improve the application. But DevOps applies to more than just the application: it's also about the processes, the people, and the tools. DevOps, at its core, is a culture, a mindset. **6. Automate as much as possible:** The only way to really gain speed in delivery and deployment is by automating as much as possible. Automation also limits the occurrence of failures, such as misconfigurations.	5	2	3
	b	**What is forking? With a suitable diagram explain the concept of pushing code to the main branch using a fork** **Define 1 M, Diagram 2 M Explanation 2 M** **Forking:** In this method, teams copy code from the main and create a separate or feature branch. **or** Developers create a feature branch by taking a copy from the source code on the main branch. Developers can work in isolation on the forked code, and when they're done, commit the code back to the main branch, merging the new features or builds with it. This can't be done frequently as intensive testing is required before the merging takes place	1+2+2	2	3

					
3	a	**What is AIOps? Explain the Components used in AIOps** **Define 1 M** AIOps combines analytics of big data and ML to automatically investigate and remediate incidents that occur in the IT environment **AIOps require highly sophisticated systems, comprising the following components:** ▪ Data Analytics ▪ Machine Learning ▪ Automation ▪ Visualization **Data analytics:** The system gathers data from various sources containing log files, system metrics, monitoring data, and also data from systems outside the actual IT environment, such as posts on forums and social media **Machine Learning:** AIOps uses algorithms. In the beginning, it will have a baseline that represents the normal behavior of systems, applications, and users. Applications and the usage of data and systems might change over time. AIOps will constantly evaluate these new patterns and learn from them, teaching itself what the new normal behavior is and what events will create alerts **Automation:** This is the heart of AIOps. If the system detects issues, unexpected changes, or abnormalities in behavior, it will prioritize and start remediation. It can only do that when the system is highly automated. From the analytics output and the algorithm, AIOps systems can determine what the best solution is to solve an issue. If a system runs out of memory because of peak usage, it can automatically increase the size of memory. **Visualization:** Although AIOps is fully automated and self-learning, engineers will want to have visibility of the system and its actions. For this, AIOps offers real-time dashboards and extensive ways of creating reports that will help in improving the architecture of systems.	1+4	2	3
	b	**Illustrate how to optimize the cloud environments using AIOps** The following guidelines are recommended to successfully implement an AIOps strategy:	5	3	3

		1. AIOps systems are learning systems 2. Data is essential in AIOps 3. Most important in a successful implementation is to standardize **Optimizing cloud environments using AIOps** The two major benefits of AIOps are, ▪ first, the speed and accuracy in detecting anomalies and responding to them without human intervention. ▪ Second, AIOps can be used for capacity optimization. Most cloud providers offer some form of scale-out/-up mechanism driven by metrics, already available natively within the platform.			
4	a	**Discuss the following cloud tools** **i. AWS Cloud Watch** The latter is a distributed tracing service that provides end-toend visibility into application performance and behavior and allows users to visualize and analyze the flow of requests and responses across distributed systems. **ii. GCP** In Google Cloud Platform Services (GCP), we could identify Cloud Operations—formerly Stackdriver—as an AIOps-enabled tool, since it collects and analyzes metrics, logs, and traces from GCP resources and applications, and provides visibility into operational health and performance **iii. OCI** In Oracle Cloud Infrastructure (OCI), we would look at Oracle Management Cloud, a suite of management and monitoring services for OCI	6	2	1
	b	**What do you mean by GreenOps? Discuss its advantages** GreenOps is becoming increasingly relevant in today's world, where concerns about climate change and sustainability are growing. What do we mean by GreenOps? Before we dive into that, it's relevant to notice that GreenOps and AIOps are actually quite intensively related. Both concepts make use of AI, as we will learn In short, we can define GreenOps as the practice of using cloud technology to optimize the environmental sustainability of IT operations, helping organizations to reduce their carbon footprint and operate in a more environmentally friendly manner. The cloud offers a number of benefits when it comes to achieving sustainability goals. One of the most significant advantages of the cloud is that it	4	1	3

		allows organizations to use shared resources, which can reduce the overall energy consumption of IT operations. By using virtualized infrastructure and shared resources, organizations can improve the efficiency of their IT operations and reduce the number of physical servers they need to run. Another advantage of the cloud is that it allows organizations to scale their operations up or down quickly and easily, depending on their needs.			
5	A	**Illustrate in detail the Build and Release pipeline used in DevOps** The below Figure shows the concept of implementing a build and release pipeline with various test stages.  The code is developed in the build pipeline and then sent to a release pipeline where the code is configured and released for production. During the release stages, the full build is tested in a test or Quality and Assurance (Q&A) Assurance environment. In Q&A, the build is accepted and released for deployment into production	6	3	3
5	b	**Identify the various steps involved in successful implementation of DevOps (Each steps Carries 4 marks)** **To get to a successful implementation of DevOps, an organization is advised to follow these steps:** 1. One of the key principles in DevOps is autonomous teams that take end-to-end responsibility. 2. Choose the CI/CD system. Decide on the CI/CD system and ensure all teams work with that system. Again, it's about consistency. 3. It's advised to perform a proof of concept. Generic Test Agreement (GTA) describes what and how tests must be executed before systems are pushed to production. 4. Automate as much as possible. This means that enterprises will have to adopt working in code, including Infrastructure as Code (IaC)	4	3	3
