

## MEMORANDUM OF UNDERSTANDING

This memorandum of understanding ("Agreement" or "MOU") is made on 19<sup>th</sup> day of January 2024 ("Execution date") and effective from 19<sup>th</sup> day of January 2024 ("Effective Date") at \_\_\_\_\_ by and between:

- (1) **AU Small Finance Bank Limited**, having CIN no. L36911RJ1996PLC011381, a small finance Bank duly incorporated under Section 22 of Banking Regulation Act, 1949 having its registered office at 19-A, Dhuleshwar Garden, Ajmer Road, Jaipur, Rajasthan, 302001 hereinafter referred to as "AUSFB" (which expression shall, unless repugnant to the context or meaning thereof, be deemed to mean and include its successors and assigns) of the **ONE PART**

and

- (2) **GLA University**, a private state university, GLA University is a private university in Mathura, Uttar Pradesh. It has been declared fit to receive central assistance under Section 12B of UGC Act, 1956 after proper assessment for the same by the UGC. It is recognized by University Grants Commission (UGC), NCTE and Pharmacy Council of India. It has been accredited by the National Assessment and Accreditation Council (NAAC) with 'A+' Grade and it also comes in the TIMES Higher Education 2024 Rankings, with the worldwide band rank of 1001-1200, all India rank of 44 and Research Quality (World) Rank of 691, having its registered office at 17km Stone, NH-2, Mathura-Delhi Road Mathura, Chaumuhan, Uttar Pradesh 281406 hereinafter referred to as "GLAU" (which expression shall, unless repugnant to the context or meaning thereof, be deemed to mean and include its successors and assigns), of the **OTHER PART**,

Wherein AUSFB and University are individually referred to as a "Party" and jointly referred to as "Parties".

### **WHEREAS:**

- a) AUSFB is a leading Small Finance Bank providing banking & financial services ("Services") to its customers.
- b) AU Small Finance Bank is coming up with a training program for students who aspire to make a career in banking and fintech industries.
- c) University is a Deemed to be University notified Under Section 3 of University Grants Commission Act, 1956 by University Grants Commission.

### **NOW, THEREFORE, the Parties agree as follows:**

- a) University and AUSFB are interested in collaborating for a Campus Internship program.
- b) Provide/receive handholding/mentoring support exclusively for promoting innovation and startups.
- c) To pursue this intention, the Parties desire to enter into this MOU in order to apply their complimentary capabilities for the benefit of both the Parties.

THEREFORE, in consideration of the foregoing and the mutual covenants contained herein, the Parties agree as set out below:

### **1. SCOPE OF SERVICES**

दिनांक: 19/06/2023

क्र. सं. 11325

मुद्रा क का मूल्य ..... 100.00 रु0.....

नाम - AU SMALL FINANCE BANK LTD

निवास स्थान - Jaipur

मुद्रा क खरीदने का आधार व सम्बन्धित कार्यो का प्रमाणन -  
Agreement

राजस्थान स्टाम्प अधिनियम , 1998 के अन्तर्गत स्टाम्प राशि पर  
प्रभारित अधिभार

1. आधारभूत अवसंरचन सुविधाओं हेतु

(धारा 3-क) 10% रुपये ..... 10 ....

2. गाय और उसकी नस्ल के संरक्षण और संवर्धन हेतु / प्राकृतिक  
आपदाओं एवं मानव निर्मित आपदाओं के निवारण हेतु

(धारा 3-ख) 20% रुपये ..... 20 ....

कुल योग ..30....

कृष्ण कुमार शर्मा  
स्टाम्प विक्रेता ला. नं. 9/01  
जिलाधीश कार्यालय, जयपुर

हस्ताक्षर स्टाम्प विक्रेता  
कृष्ण कुमार शर्मा ला. नं. 9/01



- 1.1. Parties propose to establish a formal working relationship in relation to provision of providing various Tech Training & BFSI training services of AUSFB in order to establish a campus internship program ("Program") for the students of the University (hereinafter "Purpose").
- 1.2. Each Party shall appoint single point of contact for performing the service and managing the relationship with each other (hereinafter "Project Manager").
- 1.3. The duration of the Program will be 1 year.
- 1.4. For first 6 months, selected candidates will undergo a curriculum (Annexure I) prepared by the AUSFB for the students selected for the Program before offering them internship.
- 1.5. For next 6 months, candidates will attend a compulsory AUSFB Internship program post completing the curriculum (Annexure I) successfully. (In their last year/semester).
- 1.6. Parties hereby agree that there will not be an exchange of funds between the Parties for tasks/services associated with this MOU. University undertakes to not impose any additional fees on the students related to offering of additional curriculum (Annexure I) and training.
- 1.7. Candidates who are unable to clear internship Program will return to university after the completion of the internship Program.

## 2. ROLES AND RESPONSIBILITIES OF THE PARTIES

### 2.1. AUSFB shall:

- 2.1.1. Conduct session at University to explain end to end program to students and their career path with AUSFB post completion of Training & Internship.
- 2.1.2. Explain students the selection criteria/ Bond (If any), Duration, final assessment kept by AUSFB.
- 2.1.3. Issue an internship letter to selected candidates for internship Program after successful internship period of 6 months with AUSFB. In case any candidate leaves the internship before 6 months, he/she will not be given internship letter.
- 2.1.4. Pay a monthly stipend of Rs. 15,000 (Rupees Fifteen Thousand only) to the candidate during 6 months of internship Program.
- 2.1.5. Assess candidates in the 5th month of the Program.
- 2.1.6. The curriculum (Annexure I) will be based on technologies used by AUSFB. The teachers will be trained to teach the requisite curriculum (Annexure I) to the students.
- 2.1.7. Share the names of the selected candidates with the University post completion of 6 months in internship.
- 2.1.8. AUSFB shall share the LOI and Pre-placement offer document with selected candidate. Terms mentioned in these documents has to be adhered by candidate till successful completion of internship.
- 2.1.9. Period of internship will be decided by AUSFB.
- 2.1.10. Upon completion of 6 months of Program, onboard the selected candidates as full-time employees ("**Employees**") with AUSFB and execute a service agreement with such candidates as per the terms and conditions proposed by AUSFB.
- 2.1.11. Offer annual fixed package of INR- 5 lacs (Five Lac) for B.Tech and 4 lacs (Four Lacs) for MCA students from date of joining after final selection and complete 6 months internship. AUSFB may offer variable pay to the Employees over and above fixed package as per the sole discretion of AUSFB.
- 2.1.12. AUSFB shall not be liable to pay or reimburse any university or tuition fees paid by the candidates to the University and/or collected by university from the candidates for the Program.
- 2.1.13. Selection of candidate and Onboarding of the Employee shall be at sole discretion of AUSFB and AUSFB shall not be under any obligation for any reason whatsoever to select or onboard the candidates.

### 2.2. University shall: -



- 2.2.1. Design the curriculum (Annexure I) and train the candidates as per the University's policy in close collaboration with AUSFB.
- 2.2.2. University may allow candidate(s) to sit in other campus placements to whom AUSFB has issued LOI (Letter of Intent).
- 2.2.3. Not discuss, communicate or promise to the candidates any information relating to selection, stipend or onboarding on behalf of AUSFB unless specified by AUSFB in writing.

### **3. MUTUAL REPRESENTATIONS AND WARRANTIES**

3.1. Each Party represents, warrants and undertakes to the other Party as follows:

- a) The Party has the capacity and authority to enter into this MOU;
- b) The persons entering into this MOU on behalf of the Party have been duly authorized to do so;
- c) this MOU and the obligations created hereunder are binding upon the Party and enforceable against the Party in accordance with their terms (subject to applicable principles of equity) and do not and will not violate the terms of any other agreement, or any judgment or court order, by which the Party is bound;
- d) There is no proceeding pending or threatened which to the Party's knowledge, challenges or may have a material adverse impact on this MOU or the ability of the Party to perform its obligations pursuant to this MOU; and
- e) It has not withheld any information which is required for effective performance of the contractual obligations under this MOU and that information's provided to the other Party are complete, true and accurate to the best of its knowledge and belief.

3.2. Each Party acknowledges that the other Party has entered into this MOU in reliance on the representations, warranties and undertakings set out hereunder.

### **4. TERM**

The Term of this MOU shall be commenced from the Effective Date and shall end after 24 months from the Effective Date (ie 15<sup>th</sup> October 2023), unless as otherwise agreed upon in writing or terminated in accordance with the provisions of this Agreement.

### **5. TERMINATION**

Either party may terminate this MOU by giving Thirty (30) days prior written notice to the other.

This MOU may be terminated by:

- a) AUSFB, without any prior notice, upon breach of any obligations or responsibilities undertaken by the University.
- b) The aggrieved Party, upon notice, where breaching Party commits a material breach of the terms, which is:
  - (i) Incapable of being remedied; or
  - (ii) Capable of being remedied, remains un-remedied, within a period of thirty (30) days after receipt of notice from aggrieved Party requiring that the breach be remedied.
- c) Either Party, immediately upon notice, in the event of insolvency, bankruptcy, reorganization under the bankruptcy laws or assignment for the benefit of creditors of either Party.

### **6. RELATIONSHIP OF PARTIES**

The relationship of AUSFB to University is that of an independent contractor and not an employee, agent or partner of the University. Nothing herein shall be construed as creating any other relationship.

### **7. CONFIDENTIALITY**

All Confidential Information shall be held in confidence by the recipient in at least the same manner as the recipient protects its own confidential information. Neither party shall disclose, publish, release, transfer or otherwise make available Confidential Information (individually or collectively "Disclose") of, or obtained



from, the other party in any form to, or for the use or benefit of, any person or entity without the disclosing party's consent, other than to the receiving party's employees or agents on a "need to know" basis. The party receiving information shall be responsible for ensuring that its employees and agents receiving or with access to Confidential Information do not engage in actions or fail to take actions that would Disclose the Confidential Information of the other party. "Confidential Information" shall mean all information clearly identified in writing as "confidential" at the time of disclosure. The obligations set forth in this clause shall not restrict any disclosure by the receiving party, (a) required by applicable law, including tax laws which may require the disclosure of the tax treatment or tax structure of any matters contemplated hereunder, or for the defense or pursuit of legal action (and the receiving party shall use all commercially reasonable efforts to give prompt notice to the disclosing party of any pending disclosure and seek, with the cooperation of the disclosing party a protective order covering the disclosing party's information), and (b) to a party's attorneys, financial advisors and auditors or consultants under duties of confidentiality. The provisions of this clause shall not apply with respect to information that: (i) is independently developed by the recipient, without violating the disclosing party's proprietary rights, (ii) is or becomes publicly known (other than through unauthorized disclosure) or (iii) is rightfully received by a party free of any obligation of confidentiality.

The obligation of either party to maintain confidentiality shall survive termination of this MOU for a period of one (1) year thereafter.

#### **8. LIMITATION OF LIABILITY**

Except as otherwise expressly set forth in this MOU, AUSFB does not make any warranties or representations express or implied, regarding any matter, including the merchantability, non-infringement suitability, originality, fitness for a particular use or purpose, or result to be derived from the use of any services, purchased equipment or other materials provided under this MOU and all such warranties are hereby expressly disclaimed. In no event will either party be liable for any consequential or indirect loss or damages, including without limitation any loss of anticipated savings, loss of goodwill, loss of profits, loss or alteration of data, loss of use of any equipment or process arising from or as a result of this MOU.

Each party's liability for breach of its nondisclosure obligations under the Confidentiality section above or breach of the other's intellectual property rights shall not be subject to the damages or liability limitations.

AUSFB and University will perform their respective duties, obligations and responsibilities as set forth under this MOU. University's failure to perform any designated responsibilities or any acts rendering AUSFB's obligation impossible will excuse AUSFB's obligation to perform its corresponding obligations under this MOU.

#### **9. INDEMNIFICATION**

Subject to the above clause each Party (the "Indemnifying Party") agrees to indemnify the other Party (the "Indemnified Party") and its officers, directors, employees and personnel who are contractors from and against any and all costs, liabilities, losses, and reasonable and properly incurred expenses (including reasonable attorneys' fees) (collectively "Losses") resulting from any claim suit, action or proceeding (each a "Claim") brought by a third party: (a) for patent, trade secret or copyright infringement by virtue of the Indemnified Party's use of materials, resources or services provided by the Indemnifying Party pursuant to this MOU (but excluding any infringement contributorily caused by the Indemnified Parties) or (b) personal injury caused by the gross negligence or willful misconduct of the Indemnifying Party. An Indemnifying Party's indemnification obligations under this provision shall be subject to: (i) receiving prompt written notice of the existence of the Claim from the Indemnified Party; (ii) being able to, at its option, control the defense of such Claim; (iii) receiving the timely cooperation of the Indemnified Party in the defense of the Claim, with the actual costs of such cooperation being borne by the Indemnifying Party, and (iv) the Indemnified Party taking all reasonable steps to mitigate any Losses which it may suffer in connection with the MOU.

This provision shall survive termination of this MOU.

#### **10. RIGHTS OF AUDIT**



AUSFB shall reserve the right to audit at its cost (not more than two times a contract year during the term and two years post expiry or termination of this Agreement), by providing prior seven (7) days written notice to validate the compliance of obligation by the University including (i) roles and responsibilities (ii) provision of services (iii) confidentiality provisions, (iv) IPR, (v) compliance of laws. If any non-compliance is revealed in the audit, AUSFB reserves to terminate the MOU and recover its loss pursuant to the breach of the University.

#### **11. FORCE MAJEURE AND EXCUSED EVENT**

Neither Party will be liable for performance delays or for non-performance due to causes beyond its reasonable control including but not limited to natural disasters or governmental acts. In the event of non-performance due to causes beyond a Party's control, continuing for more than one (1) month, the Party not-in-default shall be entitled to terminate this MOU by providing seven (7) days' notice to the non-performing Party.

#### **12. DISPUTE RESOLUTION**

In the event of a dispute concerning the conclusion, validity, interpretation or performance of this MOU, the Parties shall make every reasonable effort to reach an amicable settlement in good faith. Notwithstanding anything to the contrary stated in this MOU, either Party shall have the right to seek injunctive relief from any courts of appropriate jurisdiction for breach of confidentiality or infringement of any intellectual property rights.

In the event that the Parties are unable to resolve a Dispute in accordance with the amicable settlement, the dispute shall be referred to arbitration by a sole Arbitrator appointed by the mutual decision of both AUSFB and GLAU. The award of the Arbitrator shall be final and binding on the Parties. The Arbitration and Conciliation Act, 1996, or any statutory modification thereof, shall apply to the arbitration proceedings, which shall be held in Jaipur and conducted in the English language.

In respect of the matters where it is determined in an arbitration proceeding conducted in accordance with the preceding paragraph that (i) the arbitration proceeding provided in such paragraph is unenforceable; or (ii) the subject matter thereof is non-arbitrable under the Indian Arbitration and Conciliation Act 1996, as amended, in such a situation, courts in Jaipur, India will have exclusive jurisdiction in relation to such matters, each party irrevocably waives any right it may have to object to an action being brought in any of those courts, to claim that the action has been brought in an inconvenient forum or to claim that those courts do not have jurisdiction.

#### **13. NON-SOLICITATION**

Except for the selected candidates by AUSFB under the Program, neither Party shall during the term of this MOU and for a period of one (1) year thereafter, directly or indirectly, solicit or recruit the employees of the other Party who are directly involved or associated with the services and/or the Program at any time during the term of this MOU.

#### **14. INTELLECTUAL PROPERTY RIGHTS**

There shall be no transfer of Intellectual Property rights (IPR) owned by either AUSFB to the University or by the University to AUSFB as a result of AUSFB providing services to the University under this MOU.

#### **15. ACCESS TO INFORMATION**

University agrees to ensure that any information which AUSFB may require for the purpose of providing the services shall be made available to it, as and when they may reasonably require. University agrees that AUSFB shall not be held responsible or liable if and to the extent that information material to the Services is withheld or concealed from it or misrepresented to it.

#### **16. COMPLIANCE WITH SUPPLIER CODE OF CONDUCT**



The University shall note that AUSFB follows strict principles as enshrined anti-corruption legislations. The University shall conduct its business in an honest and ethical manner, shall act professionally, fairly and with integrity in all its business dealings and relationships wherever it operates and shall comply with the requisite provisions in relation to prevention of facilitation of tax evasion. The University shall further train all its directors, officers, employees, representatives, subcontractors and agents in a manner reasonably designed to ensure compliance with such policies and procedures, including the Supplier Code of Conduct, which are posted on AUSFB website: <https://www.aubank.in> – Code of conduct. The University will ensure that appropriate measures are taken to comply with this Section.

Any violations of these principles will be viewed seriously including termination of this MOU and such other measures as mandated under applicable laws. In case, the University has any doubts or require any clarification, the University should get in touch with AUSFB's legal department. In case University has any complaint or observes any violation of corporate governance codes by any third party including AUSFB employees, the University may submit its complaint under the whistle-blower policy of AUSFB using e-mail id: [sachin.sharma19@aubank.in](mailto:sachin.sharma19@aubank.in) / [pooja.purohit@aubank.in](mailto:pooja.purohit@aubank.in)

## **17. GENERAL**

### **17.1. ASSIGNMENT**

Neither Party may assign this MOU or any part thereof and/or any of its rights and/or obligations hereunder, to any third party, other than to its affiliates or successors due to corporate restructuring without the express written consent (not to be unreasonably withheld or delayed) of the other Party and any such assignment in contravention of this provision shall be void. This MOU shall be binding upon the successors and permitted assigns of both the Parties.

### **17.2. BINDING ON SUCCESSOR**

This MOU shall be binding on any successor in title, in the event of any acquisition, merger, divestiture of either Party. Accordingly, all rights and obligations of each Party in the event of acquisition, merger or divestiture shall mutatis mutandis pass on the successor in title or assignee.

### **17.3. PUBLIC ANNOUNCEMENTS**

Neither Party may publicize or disclose to any third party, without the written consent of the other Party, either the terms of this MOU or the fact of its existence and execution, except as may be necessary to comply with other obligations stated in this MOU or as otherwise required by law.

### **17.4. WAIVER**

Either Party's failure to exercise any of its rights under this MOU will not constitute or be deemed to constitute a waiver or forfeiture of such rights.

### **17.5. SURVIVAL**

All the sections of this MOU which by their nature are intended to survive the termination, shall survive any termination of this MOU.

### **17.6. SEVERABILITY**

If any term or provision of this MOU is held to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall in no way be affected or impaired thereby, and the Parties shall substitute for the affected portion an enforceable provision(s) which most closely approximates the intent and the economic effect thereof.

### **17.7. NOTICES**

All notices related to this MOU shall be in writing and delivered by reliable overnight delivery service, to the registered address of each Party.

### **17.8. COMPLIANCE WITH LAWS:**

The parties shall comply with all applicable laws and regulations. Notwithstanding the generality of the foregoing the parties shall comply with laws relating to anti-bribery and anti-corruption.

**17.9. NO THIRD-PARTY BENEFICIARIES**

This MOU shall not confer any rights or remedies upon any third-party other than the parties to this MOU and their respective successors and permitted assigns.

**17.10. GOVERNING LAW**

This MOU will be governed by the laws of India and the parties agree that courts in Jaipur shall have exclusive jurisdiction without giving effect to conflict of laws principles.

**17.11 SINGLE POINT OF CONTACT (SPOC)**

**For AU Small Finance Bank Limited**

Name:- Pooja Purohit

Designation:- AVP- Human Resource

Email ID :- pooja.purohit@aubank.in

Contact No. :- 8905994162

**For GLA University**

Name:- Rahul Singh

Designation Asso. GM – Corporate Relations

Email ID :- Rahul.singh@gla.ac.in

Contact No. :- 9997105543 /6309546077

**17.12 ENTIRE AGREEMENT**

- a) This MOU constitute the entire Agreement between the Parties, and supersede any previous or contemporaneous communications, representations, MOUs or undertakings between the Parties, whether oral or written, regarding the subject matter of this MOU.
- b) This MOU may not be modified in any manner except by an instrument in writing signed by a duly authorized officer or representative of each of the Parties hereto. This paragraph may not be waived, expressly or implicitly.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be duly executed on the date set forth above.

For and on Behalf of AUSFB

**AU Small Finance Bank Limited**

Signed by: Group Head- HR

Name: Mr. Vivek Tripathi

For and on Behalf of GLA University

Signed by: Registrar

Name: Mr. Ashok Kumar Singh



## Annexure I

### Technology Stacks:

## Annexure I

### Technology Stacks:

#### ❖ Linux OS administration: -

##### 1. File System Navigation and Management:

- Use commands like **cd**, **ls**, **pwd**, **mkdir**, **rmdir**, **cp**, **mv**, **rm**, and **touch** to navigate and manage files and directories.

##### 2. User and Group Management:

- Create, modify, and delete user accounts using commands like **useradd**, **passwd**, **userdel**, and **groupadd**.
- Assign users to groups and manage group memberships with commands like **usermod** and **usergrp**.

##### 3. File Permissions and Ownership:

- Understand and manipulate file permissions using **chmod**.
- Change file ownership with **chown** and **chgrp**.
- View permissions and ownership using **ls -l**.

##### 4. Package Management:

- Use package managers like **apt**, **yum**, or **dnf** to install, update, and remove software packages.
- Common package management commands include **apt-get**, **yum install**, **dnf update**, and **rpm**.

##### 5. Process Management:

- Monitor and manage running processes with commands like **ps**, **top**, **kill**, and **pkill**.
- Start and stop services using **systemctl** (systemd) or **service** (init).

##### 6. System Information:

- Retrieve system information with commands like **hostname**, **uname**, **lsb\_release**, and **free**.

##### 7. System Monitoring and Logs:

- Check system logs using **journalctl** (systemd) or **/var/log** files.
- Monitor system resource usage with tools like **top**, **htop**, and **vmstat**.

##### 8. Networking:

- Configure network interfaces with **ifconfig**, **ip**, and **netplan**.
- Troubleshoot network issues using **ping**, **traceroute**, and **netstat**.
- Manage DNS resolution in **/etc/resolv.conf**.



❖ **Windows server Administration: -**

**1. User Account Management:**

- Create, modify, and delete user accounts.
- Manage user passwords and account properties.
- Assign users to different groups with specific permissions.

**2. File and Folder Management:**

- Create, move, copy, and delete files and folders.
- Set file and folder permissions and ownership.
- Use Windows Explorer or the Command Prompt for file operations.

**3. System Settings and Control Panel:**

- Adjust system settings, including display, sound, and power options.
- Use the Control Panel to configure various aspects of the system.
- Access and modify system properties.

**4. Software Installation and Removal:**

- Install and uninstall software applications through the Control Panel or using installer packages.
- Use Windows Update to keep the system and software up-to-date.

**5. System Monitoring and Task Manager:**

- Monitor system performance using the Task Manager.
- Manage running processes and applications.
- Identify and troubleshoot system resource issues.

**6. Device Management:**

- Install, update, and troubleshoot hardware drivers.
- Access the Device Manager to manage hardware devices.
- Configure hardware settings and peripherals.

**7. Network Configuration and Troubleshooting:**

- Set up and configure network connections, including Wi-Fi and Ethernet.
- Troubleshoot network issues using tools like "ipconfig" and "ping."
- Configure network sharing and access permissions.

**8. Security and Antivirus:**

- Configure and manage Windows Firewall settings.
- Install and update antivirus software to protect against malware and viruses.
- Regularly apply security updates and patches.

❖ **VMware vSphere virtualization administration: -**

**1. Installation and Configuration:**

- Install VMware vSphere Hypervisor (ESXi) on your physical server or host.
- Configure network settings, including IP addresses, DNS, and gateway settings for ESXi.
- Install and configure VMware vCenter Server if managing multiple hosts.

**2. Virtual Machine (VM) Creation:**

- Create new virtual machines using the vSphere Client.
- Choose hardware specifications such as CPU, RAM, storage, and network settings.
- Install guest operating systems on VMs.



### 3. Resource Allocation:

- Allocate CPU and memory resources to virtual machines.
- Use resource pools to group VMs and allocate resources collectively.
- Set reservations, limits, and shares to control resource allocation.

### 4. Storage Management:

- Add and manage datastores (storage devices) for VM storage.
- Create virtual machine disks (VMDK files).
- Monitor storage usage and performance.

### 5. Networking Configuration:

- Configure virtual switches and port groups.
- Assign network adapters to VMs.
- Set up VLANs and network segmentation as needed.

### 6. Snapshot Management:

- Create snapshots of VMs to capture their current state.
- Use snapshots for backup purposes or to revert to previous states.
- Manage and remove snapshots when they are no longer needed.

### 7. Cloning and Templates:

- Clone existing VMs to create duplicates with identical configurations.
- Create VM templates for faster provisioning of VMs.

## ❖ Kubernetes basic administration: -

### 1. Cluster Setup and Installation:

- Set up a Kubernetes cluster by installing a Kubernetes distribution like kubeadm, kops, or Minikube.
- Configure and initialize the control plane and worker nodes.

### 2. Kubectl Configuration:

- Install and configure the **kubectl** command-line tool to interact with the Kubernetes cluster.
- Use **kubectl** to manage and monitor the cluster, such as creating and inspecting resources.

### 3. Nodes and Pods:

- Understand the concept of nodes (physical or virtual machines) and how they form the foundation of a Kubernetes cluster.
- Create and manage pods, which are the smallest deployable units in Kubernetes, using YAML manifest files.

### 4. Deployments and Replicas:

- Use Deployments or ReplicaSets to define desired pod replicas and manage rolling updates.
- Deploy and scale applications by creating or modifying Deployment objects.

### 5. Services and Networking:

- Create Kubernetes Services to expose pods to the network.
- Understand Kubernetes networking concepts like ClusterIP, NodePort, and LoadBalancer.
- Use Ingress controllers to manage external access to services.

### 6. Configuration Management:

- Use ConfigMaps and Secrets to externalize configuration settings from application code.



- Mount configuration data into pods as environment variables or volumes.
- 7. Storage Management:**
    - Define PersistentVolume (PV) and PersistentVolumeClaim (PVC) resources to manage storage for applications.
    - Use storage classes to dynamically provision storage resources.
  - 8. Monitoring and Logging:**
    - Implement monitoring and logging solutions for the cluster and applications, such as Prometheus, Grafana, and ELK Stack.
- 

❖ **AWS cloud basic administration: -**

- 1. Creating an AWS Account:**
    - Sign up for an AWS account.
    - Set up billing and payment methods.
    - Configure account settings and enable multi-factor authentication (MFA) for security.
  - 2. Access Management (IAM):**
    - Create and manage IAM users and groups.
    - Assign permissions and policies to control access to AWS resources.
    - Use IAM roles for services and EC2 instances.
  - 3. Resource Provisioning (EC2):**
    - Launch and manage EC2 (Elastic Compute Cloud) instances.
    - Choose instance types, configure security groups, and assign key pairs.
    - Create custom Amazon Machine Images (AMIs) for application deployment.
  - 4. Storage Services:**
    - Use Amazon S3 (Simple Storage Service) for object storage.
    - Create and manage EBS (Elastic Block Store) volumes for EC2 instances.
    - Implement versioning and lifecycle policies for S3 objects.
  - 5. Networking and VPC:**
    - Set up Virtual Private Cloud (VPC) networks.
    - Configure subnets, route tables, and security groups.
    - Use Elastic Load Balancing (ELB) for distributing traffic across multiple EC2 instances.
  - 6. Database Services:**
    - Create and manage RDS (Relational Database Service) instances for MySQL, PostgreSQL, or other database engines.
    - Use DynamoDB for NoSQL database needs.
    - Configure database backups, snapshots, and scaling.
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❖ **Oracle Cloud: -**

- 1. Creating an Oracle Cloud Account:**
  - Sign up for an Oracle Cloud account.
  - Set up billing and payment methods.
  - Configure account settings and security settings.
- 2. Access Management (IAM):**



- Create and manage IAM users, groups, and compartments.
  - Assign permissions and policies to control access to Oracle Cloud resources.
  - Use dynamic groups and instance principals for more secure access.
3. **Resource Provisioning (Compute):**
    - Launch and manage virtual machines (VMs) using Oracle Cloud Compute services.
    - Choose VM shapes, configure networking, and assign SSH keys for authentication.
    - Create custom images and boot volumes for VM deployment.
  4. **Storage Services:**
    - Use Oracle Cloud Object Storage for scalable and secure object storage.
    - Configure block storage using Oracle Cloud Block Volumes.
    - Set up file storage with Oracle Cloud File Storage Service.
  5. **Networking and Virtual Cloud Networks (VCNs):**
    - Create and manage Virtual Cloud Networks (VCNs) to isolate and control network traffic.
    - Configure subnets, route tables, and security rules within VCNs.
    - Use Oracle Cloud Load Balancer to distribute traffic across multiple instances.
  6. **Database Services:**
    - Create and manage Oracle Cloud Database services, including Autonomous Database and Oracle Database Cloud Service.
    - Configure database backups, snapshots, scaling, and high availability options.
    - Implement Data Guard for disaster recovery.
  7. **Security and Compliance:**
    - Implement security best practices, including encryption, network security, and IAM policies.
    - Monitor and enforce compliance with Oracle Cloud Guard.
    - Use Oracle Identity Cloud Service (IDCS) for identity and access management.
  8. **Monitoring and Logging:**
    - Set up Oracle Cloud Monitoring for monitoring OCI resources.
    - Configure alarms and notifications based on metrics.
    - Use Oracle Cloud Logging for centralized log management.
- 

❖ **Shell Scripting basic: -**

1. **Choosing a Shell:**
  - Common shells include Bash (Bourne Again Shell), sh (Bourne Shell), and zsh (Z Shell).
  - Most Unix-like systems default to Bash, making it a good choice for beginners.
2. **Creating a Shell Script:**
  - Create a new text file with a **.sh** extension (e.g., **myscript.sh**).
  - Add a shebang line at the top to specify the shell to use (e.g., **#!/bin/bash**).
3. **Executing Shell Scripts:**
  - Make the script executable using the **chmod** command (e.g., **chmod +x myscript.sh**).



- Run the script using `./myscript.sh`.

#### 4. Comments:

- Use `#` to add comments in your script for documentation.
- Comments are ignored by the shell and are for human readability.

### ❖ Ansible basic administration: -

#### 1. Installing Ansible:

- Install Ansible on a control node (your local machine or a dedicated server) from which you will manage remote hosts.
- Ansible is typically installed using package managers like **apt** or **yum** on Linux or via **pip** (Python package manager).

#### 2. Inventory:

- Create an Ansible inventory file (by default, named **inventory**) to define the list of remote hosts or target systems you want to manage.
- Define groups of hosts for easier management.

iniCopy code

```
[web] webserver1 ansible_host=192.168.1.101 webserver2 ansible_host=192.168.1.102
[db] dbserver1 ansible_host=192.168.1.201
```

#### 3. Playbooks:

- Write Ansible playbooks using YAML syntax. Playbooks describe the desired state of the system and the tasks to achieve that state.

yamlCopy code

```
--- - name: Install Nginx hosts: web tasks: - name: Update package cache apt:
update_cache: yes - name: Install Nginx apt: name: nginx state: present
```

#### 4. Running Playbooks:

- Use the **ansible-playbook** command to execute playbooks against your inventory.

bashCopy code

```
ansible-playbook myplaybook.yml
```

#### 5. Modules:

- Ansible modules are reusable scripts that perform specific tasks on managed hosts.
- Common modules include **apt**, **yum**, **copy**, **file**, **service**, and many more.

#### 6. Roles:

- Roles are a way to organize tasks and files in a structured manner.
- Roles help in breaking down complex configurations into manageable pieces.

#### 7. Variables:

- Use variables in playbooks to make them more flexible and reusable.
- Variables can be defined in playbooks, inventory, or separate variable files.

### ❖ Storage basic administration: -

#### 1. Data Storage Devices:

- **Hard Disk Drive (HDD):** A traditional mechanical data storage device that uses spinning disks to read and write data.



- **Solid-State Drive (SSD):** A modern storage device that uses flash memory chips for faster data access and better reliability.
  - **Optical Drives:** Devices like CD/DVD/Blu-ray drives that use laser technology to read and write data on optical discs.
  - **USB Flash Drives:** Portable and non-volatile storage devices that connect via USB ports.
  - **Network Attached Storage (NAS):** A dedicated device or server connected to a network for shared data storage and access.
2. **Storage Capacity:**
- Storage capacity is the amount of data that a storage device can hold, typically measured in bytes (e.g., gigabytes, terabytes, petabytes).
  - Larger capacity storage devices can store more data but are often more expensive.
3. **Storage Hierarchy:**
- Storage devices can be categorized into tiers or levels based on their speed, cost, and accessibility.
  - Examples of storage tiers include primary storage (fast but expensive), secondary storage (slower but cost-effective), and archival storage (slow but low cost).
4. **File Systems:**
- File systems are methods for organizing and managing data on storage devices.
  - Common file systems include NTFS (Windows), ext4 (Linux), HFS+ (macOS), and FAT32 (universal).
  - File systems define how data is stored, named, and accessed.
5. **Data Redundancy and Backup:**
- Data redundancy involves creating duplicate copies of data for backup and fault tolerance.
  - Regular backups are essential to protect against data loss due to hardware failures, human errors, or data corruption.
6. **Storage Access Methods:**
- **Block Storage:** Divides storage into fixed-size blocks, often used for raw storage devices and virtual machine disks.
  - **File Storage:** Organizes data into files and folders, suitable for general-purpose storage and user access.
  - **Object Storage:** Stores data as objects with metadata, ideal for web applications and cloud storage.
7. **RAID (Redundant Array of Independent Disks):**
- RAID is a method of combining multiple physical disks into a single logical unit to improve data performance, redundancy, or both.
  - RAID levels include RAID 0 (striping), RAID 1 (mirroring), RAID 5 (striping with parity), and others.
8. **Data Access Speed:**
- Data access speed is determined by factors such as the storage device type (HDD vs. SSD), interface (SATA, NVMe), and rotational speed (for HDDs).
9. **Latency and Seek Time:**
- Latency is the time it takes for a storage device to respond to a data request.
  - Seek time is the time required to position the read/write head to the desired location on a hard disk.



## 10. Storage Protocols:

- Storage devices and systems communicate with computers using various protocols like SATA, SCSI, Fibre Channel, and iSCSI.

### ❖ Backup basic concept: -

#### ❖ Data Backup:

- Data backup involves making a duplicate copy of data from its original location (source) and storing it in a secondary location (backup storage).
- The primary purpose of data backup is to protect against data loss caused by hardware failures, software issues, accidental deletions, and other unforeseen events.

#### ❖ Backup Methods:

- There are several backup methods, including:
  - **Full Backup:** A complete copy of all data at a specific point in time.
  - **Incremental Backup:** Copies only the data that has changed since the last backup, reducing storage space and backup time.
  - **Differential Backup:** Copies all changes made since the last full backup, providing faster restores than incremental backups.

#### ❖ Backup Storage:

- Backup data is stored in secondary storage devices or media such as external hard drives, network-attached storage (NAS), tape drives, cloud storage, and optical discs.
- It's essential to choose a storage solution that meets your data retention and recovery needs.

#### ❖ Backup Retention:

- Backup retention defines how long backup copies are retained before they are deleted or overwritten.
- Retention policies should consider regulatory requirements, business needs, and storage capacity limitations.

#### ❖ Backup Frequency:

- The frequency of backups depends on the criticality of the data and the potential for data changes.
- Critical data may be backed up continuously or daily, while less critical data may be backed up weekly or monthly.

#### ❖ Disaster Recovery (DR):

- Disaster recovery planning involves preparing for major data loss scenarios, such as natural disasters or complete hardware failures.
- Off-site backups and data replication are commonly used for disaster recovery purposes.

#### ❖ Backup Software:

- Backup software helps automate and manage backup processes, scheduling, and retention policies.
- Examples of backup software include Veeam, Acronis, Backup Exec, and open-source solutions like Duplicity and Amanda.

### ❖ Full Stack, Java spring boot, Devops , Cloud-AWS , Azure