



F. No.5-445/22-23/Bioinformatics/AIII
20th August 2024

**NOTICE INVITING TENDER FOR
Establishment of Cloud Solution for Bioinformatics related Computing for
ICAR-NAARM**

The Director, ICAR-NAARM invites Bids from the authorized dealers/OEM to **Establishment of Cloud Solution for Bioinformatics related Computing for ICAR-NAARM**. The bidders are requested to submit the bids online on GeM Portal. The summary of the requirement is as under.

Important dates related to submission of tender as under:

Tender Publishing Date & Time	20-08-2024	1800 hrs
Pre Bid Meeting Date & Time (ONLINE)	04-09-2024	1500 hrs
Bid Closing date & Time	10-09-2024	1800 hrs

. ** Pre Bid Meeting will be organized on 4th September 2024 at 3.00 p.m. ONLINE.

Use this Link: <https://zoom.us/meeting/register/tJ0pcuyqqD4tHNUVoJc1Zg1j9Vbvp5QYTM1a>

You can add this sentence:

Pre-Bid Date & Time: 04-Sep-2024, Time 3.00 p.m.

To register: <https://zoom.us/meeting/register/tJ0pcuyqqD4tHNUVoJc1Zg1j9Vbvp5QYTM1a> (Link will be sent automatically to the email used at the time of registration).

Establishment of Cloud Solution for Bioinformatics related Computing

ICAR-National Academy of Agricultural Research Management (ICAR-NAARM), Hyderabad is a constituent institute of Indian Council of Agricultural Research (ICAR) under Department of Agricultural Research and Education (DARE), Ministry of Agriculture and Farmers' Welfare, Government of India. ICAR-NAARM is interested in establishing a cloud based solution for bioinformatics related computing tasks and invites this bid from reputed firms engaged in developing and establishing cloud based solutions. The bidding firm is expected to study the requirement and execute in close association with the Head, Information and Communication Management of the Academy. This facility is also expected to be used as a training platform to train other users on different bioinformatics tools. The platform should be able to automate bioinformatics computing tasks using available Common Workflow Language (CWL). To start with, RNA sequence workflow (See Table 1) would be made available. Apart from this, one more workflow for next generation sequencing pipeline is also part of the scope (Table 2). The solution is expected to be cost-effective and scalable as per the requirement. The solution comprises of two parts namely a computing portal which can be accessed for bioinformatics computing requirements using the pre-defined workflows and a training event computing portal which can support the trainings of the academy for using the computing portal. The details are as follows:

Bioinformatics Computing Portal

The basic requirement for the portal requires (i) transfer genomics data to cloud and allow data access; (ii) Run secondary Workflow analysis. It should be possible to ingest, store, archive, analyse, interpret and predict genomics data. The portal should also allow the Academy to build at-scale to store, query and analyze genomic, transcriptomic and other omics data. It should also allow users to find any open data on Omics from reputed registries across the world and use them within the portal itself.

Bioinformatics Training Events

The training events in the portal involve creating temporary users who can, once authorized, participate in the training events, use the workflow/other activities from their browsers. The administrator should be able to define the events and create temporary users. Each event may have up to 50 participants and can be for 5-7 days. The users can have access only during the specified duration (in terms of days/hours) as decided by the administrator of the event.

Table 1: RNA Sequence Workflow

Sr.No.	Task	Software/Algorithm
1.	Quality control	FastQC/FastP/FASTX toolkit
2.	Trimming of the reads	Trim_galore/ Trimmomatic
3.	Mapping to reference genome	HISAT2, STAR
4.	Assembly	Cufflinks, cuffmerge, cuffdiff
5.	Conversion of mapped reads from SAM (Sequence Alignment Map) to BAM (Binary Alignment Map) format	Samtools
6.	Sorting mapped reads based on chromosomal coordinates	Samtools
7.	Differential gene expression	"DESeq2" R package from Bioconductor
8.	Go Enrichment and KEGG Pathway analysis	Blast2Go

Table 2: ChIP-Seq workflow

S.No	Task	Software/Algorithm
1.	Quality Control	FASTQC
2.	Trimming of the reads	Trimmomatic
3.	Read Mapping	Bowtie2
4.	Peak Calling	MACS2/ SICER
5.	Peak Annotation	ChIPseeker
6.	Differential Analysis	DESeq2, edgeR
7.	Gene Set Enrichment Analysis	GOseq and ChIP-Enrich/Enricher
8.	Result Interpretation and Visualization	IGV (Integrative Genomics Viewer), R packages (ggplot2, heatmap)

General Scope

The cloud service provider should be from MeitY Approved list.

The proposal is for three years from the award and payments to be made every half-yearly. The Academy has option of existing the contract with three-month notice period.

Establish Computing platform with the RNA Sequence & ChIP-Seq Work Flows identified – Automated Analysis, detailed log for error in any steps, outputs as desired.

Provision for Training Events (up to 50 users at a time) to train on the workflow with browser based secured access to authorized users to carry out the tasks/exercises for 5 – 7 days.

Provision for rerunning/recreating the workflow as and when desired.

Training of NAARM Faculty/staff on identified workflow and develop/implement other workflows

Training of IT Staff for managing the cloud solution including user management and other administrative tasks

The successful firm should execute an agreement with the Academy for the execution of the same.

Eligibility Conditions for Bidder

- Turn-over of at least 25 lakhs for the preceding three financial years (Certificate from the Auditor certifying the turnover to be attached).
- Should have a team of cloud architect, application development, cloud based managed services to support implementation of the computing portal.
- Manufacturer Authorization Form (MAF) from the Cloud Service Provider letter head authorizing the bidder to participate in this bid and extend necessary support to execute in their Cloud Platform
- Bidder should have executed at least **two (2)** cloud based solutions in Scientific Organizations/Universities etc. having a contract value of at least 8.00 lakhs per year.
- Bidder having a partner office/local support center in and around Hyderabad (GHMC) – preferable.

Eligibility Conditions for Cloud Service Provider (CSP)

- CSP must be from MEITY certified cloud service provider on GEM portal.
- CSP must have established genome sequence analysis solution through ready to use CI/CD pipelines

Technical Compliance for Bidder

Item	Compliance (Yes/No)	Remarks (If any)
Deploy the application on Cloud, user administration, security administration, planning and implementation of cloud management		
Provide all reasonably possible support to the Academy Scientists in respect of aforesaid cloud service solution.		
Ensure the platform is available 99.50 % uptime		
Enable scaling up or down of computing resources up to 10 percent automatically and beyond that limit inform the Academy for permission to scale up.		
Monitoring Portal for complete infrastructure and services procured		
Providing Access to Log file entries		
Log files should be retained for 4 months for analysis		
Provide services for archival of the data as and when technically required.		
Provide the Academy with reports on the cloud services (eg. usage, uptime) monthly or whenever asked by the Academy.		
Provide support to the technical team of the Academy for optimization of resources in the cloud environment for better performance and cost management.		
Provide interoperability support with regards to available APIs, data portability etc. for the Academy to utilize in case of change of cloud service provider, migration back to in-house infrastructure, burst to a different cloud service provider for a short duration or availing backup from a different service provider.		
The Bidder shall provide and implement security mechanisms for handling data at rest and in transit. For this, bidder shall provide encryption mechanism.		
Backups should be retained for a period of minimum 45 days		
The data stored in the cloud for a minimum of 60 days during the termination/closure process		
Bidder shall provide and implement tools and processes for monitoring the availability of assigned applications, responding to system outages with troubleshooting activities designed to identify and mitigate operational issues.		
Bidder shall make provisions to monitor the network traffic in NAARM's Cloud landscape and to analyze the amount of data transferred (uploaded/ downloaded) via Internet traffic.		
Bidder shall make provisions to monitor the uptime of all cloud resources and set threshold for alerts.MSP shall make provisions for setting alerts based on defined thresholds. There should be provision to configure different email addresses for sending alerts.		
Bidder shall ensure that there should be historical data for a minimum of 12 months for resource utilization to resolve any billing/ audit disputes if any.		
Bidder shall ensure that there are sufficient graphical reports of cloud resource utilization and available capacity.		
Bidder shall configure, schedule, monitor and manage backups of all the data including but not limited to files, images and databases as per the policy finalized		

Item	Compliance (Yes/No)	Remarks (If any)
<p>In case the primary environment goes down, the Bidder shall scale up the specified DR instances for the services to be delivered without any change in performance with the required RPO and RTO as defined as follows;</p> <p>Recovery Time Objective (RTO) <= 4 Hours Measured during the regular planned or unplanned (outage) Change over from DC to DR or vice versa.</p> <p>Recovery Point Objective (RPO) <= 2 Hours Measured during the regular planned or unplanned (outage) changeover from DC to DR or vice versa.</p>		

Cloud Service Provider Technical Compliance

Item	Compliance (Yes/No)	Remarks (If any)
Overall Requirements		
System should be able to provide ability to automatically increase/ scale the number of Instances/ VMs as the program scales, or during demand spikes for few hours/ days to maintain performance		
No prior intimation or buffer will be given, as increase/ decrease number of instances should happen automatically based on the controls/ parameters set up for maximum/ minimum usage of VMs.		
System should be able to provide metering and billing of services like VMs, storage, at hourly basis.		
In case hourly prices are not available, the same will be paid based on the pro-rata basis, the monthly rate and actual usage of the service.		
Solution Requirements		
Solution should provide temporary, limited access to individual accounts for event participants. Administrators can configure this limited access to expire based on time or budget. When the access expires, all of the resources in the account are automatically destroyed and returns the account to the account pool.		
The solution should be deployable through both CLI and API		
When a lease owner approaches or exceeds their budget, they should receive an email notification		
There should be a mechanism to deploy the infrastructure using Terraform		
The solution should provide a Utilization and usage report with details like event duration, no of accounts, lease lifetime, account utilization, budget utilization and spend		
Storage Service		
Cloud Service Provider(CSP) should offer persistent block level storage volumes for use with compute instances		
CSP shall offer Storage Service which shall provide scalable, redundant and dynamic storage up in 1GB increments per request for service from the end users		

Item	Compliance (Yes/No)	Remarks (If any)
For all volumes pertaining to production VMs, Solid State Device (SSD) based Block Storage should be offered with support of minimum 3000 IOPS		
For the proposed Block Storage, CSP should offer the capability to increase the size of an existing block storage volume, running operating system, without having to provision a new volume and copy/move the data in the increments of 1 GB		
For the proposed Block Storage option in S.No. 4, CSP managed backup service must be able to take the backup of the storage volumes		
For the proposed Block Storage option in S.No. 4, CSP managed disk encryption must be supported		
For the proposed Block Storage option in S.No. 4, size of the storage volume can be expanded without detaching the storage from the VM or deallocating the VM from the storage		
Block Storage with minimum monthly uptime of 99.99% or higher (as published in the CSP's Public Portal)		
CSP should offer a Managed hybrid cloud storage service to connect on-premises storage to Cloud Storage for any future migration to the Cloud		
CSP should offer a data recovery feature (not using backup restore functions) to help restore accidentally deleted block storage snapshots and block storage backed machine images		
Object Storage		
Cloud provider should offer secure, durable, highly scalable object storage for storing and retrieving any amount of data from the web		
Cloud service should support encryption for data at rest using 256-bit Advanced Encryption Standard (AES-256) encryption to encrypt your data		
Cloud Service should offer geographical redundant object storage with copies of data stored in minimum 3 different physical location (MeitY Empaneled)		
Cloud Service should support managing an object's lifecycle by using a lifecycle configuration, which defines how objects are managed during their lifetime, from creation/initial storage to deletion		
Cloud service should support read-after- write consistency for PUT operations for new objects		
CSP shall offer a storage tiering class that can automatically move data to low cost tiers based on the data access pattern without having to manually set a lifecycle management policy		
Genomics Service		
The cloud service provider must have a native out of the box integration with Illumina HiSeq/Thermo Fisher machines		
The cloud service provider must have a managed service capable of ingesting, storing, analysing and querying of genomics, transcriptomics and proteomics data using a single service.		
The same service mentioned in point 2 above must have more than 30 preconfigured ready to execute bioinformatics workflows.		
The same service mentioned in point 2 above must provide the ability to run custom workflows built using Nextflow or WDL		

Item	Compliance (Yes/No)	Remarks (If any)
The same service mentioned in point 2 above must provide the capability of running these workflows through a graphical interface, command line interface and API calls.		
The same service mentioned in point 2 above must ingest and transform genomics data formats such as (g)VCF, GFF3, and TSV/CSVs into Apache Iceberg tables making data accessible to be queried		
Security		
CSP must provide native service for security like Identity & access management, manage user access and encryption keys, Single sign on service for cloud and a Centralize Governance and Compliance Management		
CSP should offer an HSM as a managed service of same cloud service provider for ease of integrations, manageability and deeper integrations with rest of the services. CSP should support FIPS (Federal Information Processing Standard) 140-2 Level 3 for the storage of encryption keys SSL certificates etc. as managed service		
CSP should offer Distributed Denial of Service (DDoS) protection service for L3/L4 attacks		
CSP should offer Managed Threat Detection Service with ML based threat detection and prevention		
CSP should offer a service to centrally manage firewall rules across multiple accounts. Automatically enforce your defined security policies across existing and newly created resources.		
CSP should offer native security services from the cloud service provider for solutions such as Anti-DDoS, Web Application Firewall, Network Firewall with IPS/IDS capability, Cloud Security Posture Management, Encryption at rest and in transit, Firewall Manager, AI managed Threat Detection service, Vulnerability management		

FINANCIAL BID FORMAT & L1 SELECTION PROCEDURE

Upto 10 percent Autoscaling (Up/Down) of resources are allowed; beyond that explicit permission from the Academy is required.

Bill of Materials

(i) Details for the Computing Portal (Yearly) (Committed – Minimum)

(In Indian Rupees)

Description	Configuration	Indicative Cost					
		Year 1		Year 2		Year 3	
		Cost (Excluding All Taxes)	Taxes	Cost (Excluding All Taxes)	Taxes	Cost (Excluding All Taxes)	Taxes
Bioinformatics Server x 2	Operating system (Linux), Server (16 vCPU, 128 GB RAM, Consistent for 1 year, Number of instances: 2), Storage amount (100 GB)						
Object Storage (Intelligent – Tiering)	Storage (5 TB per month) with 50 % in Frequent Access and remaining 50% in Archival Instant Access storage						
Object Storage	Data Transfer - 1 TB per month						
File Storage	Storage Type (SSD), Throughput Capacity (125 MBps/TiB), Storage capacity (1200 GB per month)						
Omics Workflows	Per run config: 1200 GB Storage, 32vCPU, 64 GB RAM, estimated run time per task 4 hours, total runs per month (5)						
	Preconfigured workflow of GATK-BP Germline fq2vcf for 30x genome for 5 runs per month						
Omics Storage	100 new samples added every month and 100 existing samples accessed every month 20 gigabases per sample (not GB)						

Omics Analytics	Datastore for storing variant data (400 GB per month), Datastore for annotation data (400 GB per month)						
	Total						

(ii) Bioinformatics Training Events - 50 participants (One time)

Description	Configuration	Indicative Cost					
		Year 1		Year 2		Year 3	
		Cost (Excluding All Taxes)	Taxes	Cost (Excluding All Taxes)	Taxes	Cost (Excluding All Taxes)	Taxes
Training Participant server	Operating system (Linux), Server (16 vCPU, 128 GB RAM, Number of instances: 50), On-Demand Utilization 40 hours; Storage amount (100 GB)						
API Gateway	1 million REST API request units, Cache memory size (1.6 GB), 1000 WebSocket message units, 1 million HTTP API requests units, Average size of each request (512 KB), Average message size (32 KB)						
Serverless Functions	Number of requests (100000), Amount of ephemeral storage allocated (1 GB)						
Queuing Service	1 million requests, 1 million HTTP/HTTPS notifications, 1 million EMAIL/EMAIL-JSON notifications, 1 million notifications, 1 million serverless function invocations						
	Outbound data to Internet (500 GB), Standard queue requests (1 million), FIFO queue requests (1 million)						
No-SQL Database	Table class (Standard), Average item size (all attributes) (25 KB), Data storage size (100 GB)						
No-SQL Database Backup and restore	On-demand backup data storage (10 GB), Point-In-Time Recovery (PITR) data storage (10 GB), Table data restored (10 GB)						
No-SQL Database data export to object storage	Full export to Object Storage (10 GB), Incremental export to Object Storage (5 GB)						

Description	Configuration	Indicative Cost					
		Year 1		Year 2		Year 3	
		Cost (Excluding All Taxes)	Taxes	Cost (Excluding All Taxes)	Taxes	Cost (Excluding All Taxes)	Taxes
Monitoring	Number of Metrics (includes detailed and custom metrics) (100), Number of other API requests (1000000), Standard Logs: Data Ingested (1 GB), Logs Delivered to Monitoring system: Data Ingested (1 GB), Logs Delivered to Object storage: Data Ingested (1 GB), Number of Dashboards (5), Number of Standard Resolution Alarm Metrics (10), Number of High-Resolution Alarm Metrics (10), Number of composite alarms (10)						
Participant identity and access management	Number of users (50), Advanced security features enabled						
Grand Total							

TERMS AND CONDITIONS

1.	Online bids on GeM are invited for and on behalf of the Director, ICAR – NAARM, from eligible dealers / OEM for Establishment of Cloud Solution for Bioinformatics related Computing .
2.	All communications must be addressed to the Director, ICAR-NAARM, Rajendranagar, Hyderabad.
3.	Specifications: The detailed specifications for Establishment of Cloud Solution for Bioinformatics related Computing are provided in Schedule of this tender document
4.	<p><u>Eligibility Criteria:</u></p> <ol style="list-style-type: none"> a. Scanned copy of Authorized Dealer/OEM Document. b. Scanned Copy of PAN and GSTIN c. Scan of Brochure of the equipment Offered and Filled Schedule II d. Filled Annexure – A. e. Filled Details as per Annexure-B. f. Proof of at least two contracts related to similar works by authorized Bidder/OEM (The Cloud Solution for Bioinformatics related Computing) of value Rs 8 Lakhs each or above during the last 3 financial years along with duly filled Annexure-C g. Scanned copy of Bid Security Declaration Form to be submitted on Company Letterhead as per Annexure – D h. The firm should enclose copies of income tax returns for the last 2 years (Financial Year 2022-23, 2023-24) i. The firm should have turn over minimum of Rs.25.00 lakhs for the preceding three financial years. Annexure – E to be submitted as proof. j. The detailed specifications offered and its brand should be provided in the technical document k. The vendor shall supply all the components in one lot. Part supply is not allowed. The bidder shall be selected based on whole lot, not on item wise. The delivery shall not exceed 4-5 weeks from the date of receiving the supply order l. The bidder may personally visit the site for surveying before submitting the bids. m. The bidder should write the specifications of the offered products clearly.
5.	Rejection of tenders: Tenders not complying with any one of the above conditions, are liable to be rejected. No correspondence in this regard will be entertained.
6.	Rates: The rates quoted by you should be inclusive of all taxes, delivery, supply and installation, training and all other incidentals.
7.	Security Deposit: The successful bidder must furnish a Performance Security Deposit @10% on the total amount quoted which will be refunded/returned only after satisfactory completion of warranty (18 months from date of installation) of the material. The Security Deposit should be in the form of Demand Draft, Fixed Deposit Receipt or Bank Guarantee from any commercial bank and on which no interest will be paid.
8.	If after finalization of the tender, the selected firm expresses its inability to supply the material at the quoted rates, thus failing in fulfilling the stipulated terms and conditions for award of the contract, then the Security Deposit amount is liable to be forfeited in total.

9.	Payment: The firm is required to submit the GST Bill in Triplicate along with the bank details. Payment will be made only after satisfactory completion and after it has been certified by the concerned in-charge stating that the work has been done satisfactorily. Payments will be made at the end of every quarter based
10.	Taxes / Duties: GST as applicable will be paid
11.	Acceptance of tender: Director, ICAR-NAARM reserves the right to accept or reject any of the tenders either in part or in full without assigning any reason thereof.
12.	Jurisdiction: All disputes including court proceedings shall be settled within the Hyderabad jurisdiction only.
13.	The detailed specifications offered and its brand should be provided in the technical document
14.	The Finalized bidder will have to supply and install the materials within 45 days of issuance of Purchase/Supply Order.

CHECKLIST (To be uploaded with Technical Bid)

S. No.	Document to be uploaded in Technical bid on GeM Portal	Whether Uploaded (Yes/No)
1.	Scanned copy of Authorized Dealer/OEM Document.	
2.	Scanned Copy of PAN and GSTIN	
3.	Scan of Brochure of the equipment Offered. The bidder should write the specifications of the offered products clearly along with brochure and filled Schedule II	
4.	Filled Annexure – A.	
5.	Filled Details as per Annexure – B	
6.	Proof of at least two contracts related to similar works by authorized Bidder/OEM (Establishment of Cloud Solution for Bioinformatics related Computing.) of value Rs 8 Lakhs each or above during the last 3 financial years along with duly filled Annexure-C	
7.	Scanned copy of Bid Security Declaration Form to be submitted on Company Letterhead as per Annexure – D	
8.	The firm should enclose copies of income tax returns for the last 2 years (Financial Year 2022-2, 2023-24)	
9.	The firm should have turn over minimum of Rs.25.00 lakhs for the preceding three financial years. Annexure – E to be submitted as proof.	

COMMERCIAL DETAILS

(To be submitted on Firm's Letter head)

1.	Name and Address of Bidder	
2.	Telephone No. / Mobile No. / FAX No.	
3.	Email ID	
4.	Month and Year of Establishment	
5.	PAN and GSTIN Number	
6.	Bid Security Declaration Form	
7.	Local Office Address in Hyderabad / Secunderabad	

SIGNATURE OF THE BIDDER & STAMP

Date:

Place:

RELEVANT WORK EXPERIENCE DETAILS

(To be submitted on Firm's Letter head)

Sr. No.	Name of the Dept. Organization where similar supply was made	Period	
		From	To
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			

AUTHORISED SIGNATORY OF THE FIRM WITH SEAL

Place:

Dated:

UNDERTAKING

(To be submitted on Firm's Letter head)

To
The Director
ICAR-NAARM
Rajendranagar
Hyderabad 500 030

Sir,

We, the undersigned, declare that: We understand that, according to your conditions, bids must be supported by a Bid-Securing Declaration.

We accept that we will automatically be suspended from being eligible for bidding in any contract with your institute for the period of time of 2 years starting on date of closing of bids if we are in breach of our obligation(s) under the bid conditions, because we:

- (a) have withdrawn our Bid during the period of bid validity specified in the Letter of Bid; or
- (b) having been notified of the acceptance of our Bid by your institute during the period of bid validity,
 - (i) fail or refuse to execute the Contract, if required, or
 - (ii) fail or refuse to furnish the Performance Security as per tender conditions

We understand this Bid-Securing Declaration shall expire if we are not the successful Bidder.

Signature of Authorized signatory with company seal

AGENCY TURNOVER

(To be submitted on chartered Accountant's Letter head)

Name of the Firm : _____

GSTIN & PAN Details: _____

Period	Turnover
2021-22	
2022-23	
2023-24	

It is certified that the details provided above are correct and I have gone through relevant records to come out with the figures quoted above.

SIGN AND SEAL
Authorised Chartered Accountant

Place:

Dated:

Sample of BOQ

(To be filled and uploaded in GeM Bid as per the format there)

Item Num	Item Title	Item Description	Item Quant	Unit	Me	Consigner	Delivery Period (In
1	Bioinformatics Server x2 Operating system (Linux), Server (16 vCPU, 128 GB RAM, Consistent for 1 year, Number of instances: 2), Storage amount (100 GB) Year 1	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
2	Bioinformatics Server x2 Operating system (Linux), Server (16 vCPU, 128 GB RAM, Consistent for 1 year, Number of instances: 2), Storage amount (100 GB) Year 2	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
3	Bioinformatics Server x2 Operating system (Linux), Server (16 vCPU, 128 GB RAM, Consistent for 1 year, Number of instances: 2), Storage amount (100 GB) Year 3	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
4	Object Storage (Intelligent – Tiering) Storage (5 TB per month) with 50 % in Frequent Access and remaining 50% in Archival Instant Access storage Year 1	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
5	Object Storage (Intelligent – Tiering) Storage (5 TB per month) with 50 % in Frequent Access and remaining 50% in Archival Instant Access storage Year 2	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
6	Object Storage (Intelligent – Tiering) Storage (5 TB per month) with 50 % in Frequent Access and remaining 50% in Archival Instant Access storage Year 3	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
7	Object Storage Data Transfer - 1 TB per month Year 1	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
8	Object Storage Data Transfer - 1 TB per month Year 2	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
9	Object Storage Data Transfer - 1 TB per month Year 3	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
10	File Storage Storage Type (SSD), Throughput Capacity (125 MBps/TiB), Storage capacity (1200 GB per month) Year 1	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
11	File Storage Storage Type (SSD), Throughput Capacity (125 MBps/TiB), Storage capacity (1200 GB per month) Year 2	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
12	File Storage Storage Type (SSD), Throughput Capacity (125 MBps/TiB), Storage capacity (1200 GB per month) Year 3	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
13	Omics Workflows Per run config: 1200 GB Storage, 32vCPU, 64 GB RAM, estimated run time per task 4 hours, total runs per month (5) Year 1	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
14	Omics Workflows Per run config: 1200 GB Storage, 32vCPU, 64 GB RAM, estimated run time per task 4 hours, total runs per month (5) Year 2	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
15	Omics Workflows Per run config: 1200 GB Storage, 32vCPU, 64 GB RAM, estimated run time per task 4 hours, total runs per month (5) Year 3	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
16	Omics Workflows Preconfigured workflow of GATK-BP Germline fq2vcf for 30x genome for 5 runs per month Year 1	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
17	Omics Workflows Preconfigured workflow of GATK-BP Germline fq2vcf for 30x genome for 5 runs per month Year 2	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
18	Omics Workflows Preconfigured workflow of GATK-BP Germline fq2vcf for 30x genome for 5 runs per month Year 3	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
19	Omics Storage 100 new samples added every month and 100 existing samples accessed every month	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
20	Omics Storage 100 new samples added every month and 100 existing samples accessed every month	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
21	Omics Storage 100 new samples added every month and 100 existing samples accessed every month	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
22	Omics Analytics Datastore for storing variant data (400 GB per month), Datastore for annotation data (400 GB per month) Year 1	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
23	Omics Analytics Datastore for storing variant data (400 GB per month), Datastore for annotation data (400 GB per month) Year 2	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30
24	Omics Analytics Datastore for storing variant data (400 GB per month), Datastore for annotation data (400 GB per month) Year 3	As per Schedule III SL.No. (i) of the Tender document	1	UNIT	AS P	ao.stores	30