

**SRI VENKATESWARA UNIVERSITY**  
**B.Sc. DEGREE COURSE IN CLOUD**  
**COMPUTING**  
**V SEMESTER**  
**(Syllabus under CBCS w.e.f. 2022-23)**

Skill Enhancement Courses (SECs) for Semester V, from  
2022-23 (Syllabus-Curriculum)

Structure of SECs for Semester – V

*(To choose One pair from the Two alternate pairs of SECs)*

Uni v. Cod e	Cours es 6 & 7	Name of Course	Th. Hrs. / Week	IE Mar - ks	EE Mar - ks	Credi ts	Pra c.Hr s./ Wk	Mar - ks	Credit s
	6A	SOAP Integration for SaaS	3	25	75	3	3	50	2
	7A	REST Integration for SaaS	3	25	75	3	3	50	2

OR

	6B	AWS Compute Services	3	25	75	3	3	50	2
	7B	AWS Storage Services	3	25	75	3	3	50	2

**Note-1:**For Semester–V, for the domain subject Cloud Computing, any one of the two pairs of SECs shall be chosen as courses 6 and 7 ,i.e.,6A&7A or 6B&7B.The pair shall not be broken (A B allotment is random, not on any prioritybasis).

**Note-2:** One of the main objectives of Skill Enhancement Courses (SEC) is to inculcate field skills related to the domain subject in students. The syllabus of SEC will be partially skill oriented. Hence, teachers shall also impart practical training to students on the field skills embedded in the syllabus citing related real field situations.

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**B.Sc. DEGREE COURSE IN CLOUD COMPUTING**  
**V SEMESTER**  
**(Syllabus under CBCS w.e.f. 2022-23)**

Course Code:

**Course 6A: SOAP Integration for SaaS**  
(Skill Enhancement Course (Elective), 05 Credits)  
Max Marks: Theory:100 + Practical:50

**I. Learning Outcomes:**

Students after successful completion of the course will be able to:

1. Understand the architecture of a WSDL document
2. Identify various elements in a SOAP message
3. Create SOAP based web services to integration
4. Use the SOAP services exposed by Salesforce.com for integration with on-premise clouds
5. Handle security management and session management in SOAP calls

**II. Syllabus:** *(Total Hours: 90 including Teaching, Lab, Field Training and unit testsetc.)*

**UNIT-I**

Introduction to WSDL, Structure of WSDL, Abstract and Concrete WSDL, Introduction to SOAP Messages, Structure of SOAP Messages, SOAP Bindings in WSDL, Generate or Obtain the Web Service WSDL, Import the WSDL File into Your Development Platform, Primitive data types in Soap API, Introduction to SOAP UI Testing Interface.

**UNIT-II**

SOAP API Structure in Salesforce, Field Types, Compound fields, API data types and Salesforce field types, Core data types used in API calls, System fields, frequently occurring fields, API field properties,

**UNIT- III**

Custom objects, External objects, Tooling API in the Enterprise WSDL, Characteristics of API calls, Factors that affect data access, Package, and version settings

**UNIT-IV**

Error handling for session expiration, API Fault Codes, Security: User Authentication, User profile and Permission set configuration, Security token, Sharing,

**UNIT-V**

Obtaining the Partner WSDL file, Calls and the Partner WSDL, Object, fields and field data and the partner WSDL, Queries and the partner WSDL, Namespaces in the Partner WSDL, User Interface themes, Examples using the Partner WSDL.

## Practical Syllabus: Course 6A: SOAP Integration for SaaS

### III. SkillsOutcomes:

On successful completion of this practical course, student shall be able to:

1. Articulate the operations that a web service can perform based on the WSDL
2. Understand the SOAP bindings needed for service integration
3. Explain the SOAP APIs available in Salesforce
4. Integrate and invoke SOAP APIs of Salesforce from client machines using SOAP UI
5. Perform CRUD (Create, Read, Update, Delete) operations on objects of Salesforce
6. Handling authentication or authorization on secure web services

### IV. PracticalSyllabus:

1. Creating an abstract WSDL to identify various elements of a web service.
2. Converting a Java class / APEX code to a concrete web service
3. Invoking a SOAP web service from SOAP UI
4. Calling a SOAP web service from a Java class or APEX class
5. Performing create, read, update, and delete operations on different objects in Salesforce
6. Using various authentication methods to invoke secure web services.

### V. References:

1. Programming Web Services with SOAP by Doug Tidwell and James Snell
2. Salesforce.com integration Patterns by Salesforce.com
3. Web Services Testing with SoapUI by CharithaKankanamge
4. Web tutorials on SOAP API testing
5. Other web sources suggested by the teacher concerned and the college librarian including reading material

### VI. Co-CurricularActivities:

**a) Mandatory:** (*Training of students by teacher on field related skills: 15hrs*)

1. **ForTeacher:** Training of students by teacher in laboratory and field for a total of 15 hours on the concept of integration from on-premise cloud to off-premise clouds with specific reference to Salesforce.
2. **For Student:** Individual can browse through Internet to understand various integration paradigms related to SOAP with specific reference to Salesforce and is advised to submit a report on how different web services of Salesforce can be invoked from different client environments in 5 page document with relevant examples, source code and architectural diagrams.
3. Max marks for Field Work Report: 05.
4. Suggested Format for Field work: *Title page, student details, content page, introduction, any three SOAP APIs or Salesforce, invocation mechanism for these APIs, Common issues related to their invocation, Conclusion and Acknowledgements.*
5. Unit tests (IE).

### **b) Suggested Co-CurricularActivities**

1. Training of students by related industrialexperts.
2. One Seminar
3. Two Quizzes
4. Infographics on service architectural models.
5. Invited lectures and presentations on related topics by field/industrial experts.

# **SRI VENKATESWARA UNIVERSITY**

**B.Sc. DEGREE COURSE IN CLOUD COMPUTING**

**V SEMESTER - W.E.F. 2022-23**

**COURSE 6A: SOAP INTEGRATION FOR SAAS**

## **MODEL QUESTION PAPER**

Time: 3 hours

Marks: 75 marks

**Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.

Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

### **PART – A**

Answer any ***Five*** of the following question.

**(5X5=25M)**

<b>1.</b>	
<b>2.</b>	
<b>3.</b>	
<b>4.</b>	
<b>5.</b>	
<b>6.</b>	
<b>7.</b>	
<b>8.</b>	

**(P.T.O)**

**PART – B**

**Answer All The Questions. Each question carries 10 marks (5X10= 50M)**

9.	(A)  OR  (B)
10.	(A)  OR  (B)
11.	(A)  OR  (B)
12.	(A)  OR  (B)
13.	(A)  OR  (B)

**Suggested Question Paper Model for Practical Examination**  
Semester – V/ Cloud Computing- Course – 6A (SOAP Integration for  
SaaS)

**Cloud Computing**

Max. Time :3Hrs.

Max. Marks : 50

- 
- |   |      |
|---|------|
| 1. Demonstration of a given SOAP API  | 5 M  |
| 2. Identification of message structures and SOAP bindings related to the API  | 5M   |
| 3. Invocation of the API by passing relevant inputs using soap UI and Java    | 10M  |
| 4. Analysis of authentication and authorization mechanisms related to the API | 10 M |
| 5. Record+Viva-voce (10+10)   | 20 M |

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**B.Sc. DEGREE COURSE IN CLOUD COMPUTING**  
**V SEMESTER**  
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Course Code:

**COURSE 7A: REST INTEGRATION FOR SAAS**

(Skill Enhancement Course (Elective), 05 Credits)

Max Marks: Theory:100 + Practical:50

**I. Learning Outcomes:**

Students after successful completion of the course will be able to:

1. Understand the architecture of a WADL document
2. Understand different types of REST resources
3. Expose native methods as REST based web services to integration
4. Use the REST services exposed by Salesforce.com for integration with on-premise clouds
5. Understand the CURL and Workbench platforms to invoke and integrate REST services

**II. Syllabus:** *(Total Hours: 90 including Teaching, Lab, Field Training and unit testsetc.)*

**UNIT- I**

Introducing Force.com REST API, REST Resources, WADL structure, Using Compression, Using Conditional Requests, Cross-Origin Resource Sharing (CORS) framework.

**UNIT-II**

Obtain a Salesforce Developer Edition Organization; Set up Authorization, Send HTTP Requests with cURL,

**UNIT- III**

Using Workbench, Getting Information about My Organization Working with Object Metadata,

**UNIT-IV**

Working with Records, Working with Searches and Queries, Working with Recently Viewed Information, Managing User Passwords.

**UNIT-V**

Working with Approval Processes and Process Rules, Using Event Monitoring, Using Composite Resources.

# **SRI VENKATESWARA UNIVERSITY**

**B.Sc. DEGREE COURSE IN CLOUD COMPUTING**

**V SEMESTER - W.E.F. 2022-23**

**COURSE 7A: REST INTEGRATION FOR SAAS**

## **MODEL QUESTION PAPER**

Time: 3 hours

Marks: 75 marks

**Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.

Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

### **PART – A**

**Answer any *Five* of the following question.**

**(5X5=25M)**

<b>1.</b>	
<b>2.</b>	
<b>3.</b>	
<b>4.</b>	
<b>5.</b>	
<b>6.</b>	
<b>7.</b>	
<b>8.</b>	

**(P.T.O)**



**PART – B**

**Answer All The Questions. Each question carries 10 marks (5X10= 50M)**

9.	(A)  OR  (B)
10.	(A)  OR  (B)
11.	(A)  OR  (B)
12.	(A)  OR  (B)
13.	(A)  OR  (B)

## Practical Syllabus: Course7A:REST Integration for SaaS

### III. SkillsOutcomes:

On successful completion of this practical course, student shall be able to:

1. Understand the structure of a RESTful services and the differences between REST and SOAP calls.
2. Understand the REST service bindings needed for integration.
3. Understand the CORS framework
4. Create REST integrations classes.
5. Perform CRUD (Create, Read, Update, Delete) operations on objects of Salesforce using REST resources.

### IV. PracticalSyllabus:

1. Creating a REST services from a native method
2. Invoking a local REST service using any testing tool such as Postman, soap UI
3. Creating a REST integration class for invoking a salesforce REST service
4. Writing a REST integration class to perform CRUD operations on a salesforce REST resource
5. Exposing custom objects of Salesforce as REST resources.
6. Integrating two REST APIs using a common REST integration class.

### V. References:

1. REST API In A Nutshell by Van Nguyen
2. RESTFUL Web APIs: Services for a Changing World by Leonard Richardson and Mike Amundsen
3. Salesforce.com Integration patterns by Salesforce.com
4. Other web sources suggested by the teacher concerned and the college librarian including reading material

### VI. Co-CurricularActivities:

**a) Mandatory:** (*Training of students by teacher on field related skills: 15hrs*)

1. **ForTeacher:** Training of students by teacher in laboratory and field for a total of 15 hours on understanding various micro-services used in various Mobile Apps introduced by public sector agencies such as banks, Post Offices, Government Offices, etc.,
2. **For Student:** Individualscan visit a Bank or a Post Office or a Village Secretariate to understand the concept of micros services which are RESTful services used for providing citizen services. Alternatively, they can go through the manuals of certain citizen portals that expose their operations as RESTful services. They need to submit a 5-page document that illustrates any 3 RESTful services and their operations with relevant examples.
3. Max marks for Field Work Report: 05.
4. Suggested Format for Field work: *Title page, student details, content page, introduction, any three SOAP APIs or Salesforce, invocation mechanism for these APIs, Common issues related to their invocation, Conclusion and Acknowledgements.*
5. Unit tests (IE).

### **b) Suggested Co-CurricularActivities**

1. Training of students by related industrialexperts.
2. One Seminar
3. Two Quizzes
4. Infographics on service architectural models.
5. Invited lectures and presentations on related topics by field/industrial experts.

**Suggested Question Paper Model for Practical Examination**  
Semester – V/ Cloud Computing Course – 7A (REST Integration for SaaS)  
**Cloud Computing**

Max. Time :3Hrs.

Max. Marks : 50

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- |  |      |
|--|------|
| 1. Demonstration of a given REST API   | 5 M  |
| 2. Identification of message structures and REST bindings related to the API | 5M   |
| 3. Invocation of the API by passing relevant inputs using soap UI and Java   | 10 M |
| 4. Analysis of REST resources and their usage                                | 10 M |
| 5. Record+Viva-voce (10+10)  | 20 M |
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**SRI VENKATESWARA UNIVERSITY**  
**B.Sc. DEGREE COURSE IN CLOUD COMPUTING**  
**V SEMESTER**  
**(Syllabus under CBCS w.e.f. 2022-23)**

Course Code:

**Course6B: AWS Compute Services**  
(Skill Enhancement Course (Elective), 05 Credits)  
Max Marks: Theory:100 + Practical:50

**Learning Outcomes:**

Students after successful completion of the course will be able to:

1. Estimate various compute services offered by AWS
2. Understand the EC2 architecture
3. Comprehend the security schemes of AWS instances
4. Explain the load balancing and high-availability concepts

**II. Syllabus:** *(Total Hours: 90 including Teaching, Lab, Field Training and unit testsetc.)*

**UNIT- I**

Introduction to AWS, Different Compute Services, Introduction to Elastic Compute Cloud (EC2), Different AMIs, Virtualization Mechanisms used in AMIs, Examples

**UNIT-II**

Configuring the EC2 instance, Installing various programming environments, SDKs, Libraries, etc., Elastic Beanstalk, Creation of a Quick Website with very low code.

**UNIT- III**

Securing an EC2 instance, Identity Access Management, Creation of Roles, Security Groups, Access Control Mechanisms using Security Groups, Virtual Private Cloud

**UNIT-IV**

Introduction to High Availability, Availability Zones in AWS, Auto-Scaling, Cloud Watch for monitoring metrics, Scaling up and down, Load balancing

**UNIT-V**

Creating snapshots of instances, Custom AMIs, Using Elastic Block Storage, Publishing Custom AMIs in Amazon's Market Place.

# **SRI VENKATESWARA UNIVERSITY**

**B.Sc. DEGREE COURSE IN CLOUD COMPUTING**

**V SEMESTER - W.E.F. 2022-23**

**COURSE 7A: REST INTEGRATION FOR SAAS**

## **MODEL QUESTION PAPER**

Time: 3 hours

Marks: 75 marks

**Note:** This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A. Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

### **PART – A**

**Answer any Five of the following question.**

**(5X5=25M)**

<b>1.</b>	
<b>2.</b>	
<b>3.</b>	
<b>4.</b>	
<b>5.</b>	
<b>6.</b>	
<b>7.</b>	
<b>8.</b>	

**(P.T.O)**

**PART – B**

**Answer All The Questions. Each question carries 10 marks (5X10= 50M)**

9.	(A)  OR  (B)
10.	(A)  OR  (B)
11.	(A)  OR  (B)
12.	(A)  OR  (B)
13.	(A)  OR  (B)

## Practical Syllabus: Course7A: REST Integration for SaaS

### III. SkillsOutcomes:

On successful completion of this practical course, student shall be able to:

1. Create and configure an EC2 instance for different development environments based on need.

### IV. PracticalSyllabus:

1. Creation of different EC2 instances – Amazon Machine Linux, Ubuntu Linux, Windows
2. Establishing connectivity to EC2 instances using CLI for Linux machines and RDC for Windows machines
3. Creation of various security groups using IPV4/IPV6 permissions
4. Using CloudWatch for monitoring load metrics
5. Creation of auto-scaling groups and load-balancing instances
6. Creation of a VPC network

### References:

1. Amazon Web Services in Action by Michael Wittig and Andreas Wittig, Released September 2018, Manning Publications, ISBN: 9781617295119
2. AWS Developer Guides
3. Other web sources suggested by the teacher concerned and the college librarian including reading material

### Co-CurricularActivities:

#### a) **Mandatory:** (*Training of students by teacher on field related skills: 15hrs*)

1. **ForTeacher:** Training of students by teacher in laboratory and field for a total of 15 hours on understanding various kinds of compute services needed for different activities and how AWS compute services can be used for Small and Medium business at a cheaper cost.
2. **For Student:** Individuals can visit small or medium business units to understand their daily operations. They can then map these daily operations to IT operations that can be performed on a cloud instance. Students can submit a 5-page document illustrating the operations that can be performed on a cloud instance with relevant architecture model.
3. Max marks for Field Work Report: 05.
4. Suggested Format for Field work: *Title page, student details, content page, introduction, any three SOAP APIs or Salesforce, invocation mechanism for these APIs, Common issues related to their invocation, Conclusion and Acknowledgements.*
5. Unit tests (IE).

#### b) **Suggested Co-CurricularActivities**

1. Training of students by related industrialexperts.
2. One Seminar
3. Two Quizzes
4. Infographics on service architectural models.
5. Invited lectures and presentations on related topics by field/industrial experts.

**Suggested Question Paper Model for Practical Examination**  
Semester – V/ Cloud Computing Course – 7A (REST Integration for SaaS)  
**Cloud Computing**

Max. Time :3Hrs.

Max. Marks : 50

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|--|------|
| 1. Demonstration of creation of an EC2 instance                        | 5 M  |
| 2. Demonstration of connection to EC2 instance using different means   | 5M   |
| 3. Configuration of EC2 instance for running a Java and a PERL program | 10 M |
| 4. Creation of security groups for access control                      | 10 M |
| 5. Record+Viva-voce (10+10)  | 20 M |
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**B.Sc. DEGREE COURSE IN CLOUD COMPUTING**  
**V SEMESTER**  
**(Syllabus under CBCS w.e.f. 2022-23)**

Course Code:

**Course 7B: AWS Storage Services**  
(Skill Enhancement Course (Elective), 05 Credits)  
Max Marks: Theory:100 + Practical:50

**Learning Outcomes:**

Students after successful completion of the course will be able to:

1. Explain various storage services offered by AWS
2. Understand and use the database services available in AWS
3. Integrate storage services of AWS with local infrastructure
4. Use AWS databases for traditional database activities

**II. Syllabus:** *(Total Hours: 90 including Teaching, Lab, Field Training and unit testsetc.)*

**UNIT- I**

Introduction to storage concepts, AWS Object Store, Simple Storage Service (S3), Backups with S3 through CLI, Creating and Maintaining S3 buckets, AWS Glacier, Storing Objects Programmatically using S3, S3 for static Web Hosting, Ensuring Data Consistency in S3

**UNIT-II**

Introduction to EBS, Creating an EBS Volume, Attaching an EBS volume to an EC2 instance, Snapshots using EBS, Instance Store, Difference between Instance Store and EBS

**UNIT- III**

Introduction to Elastic File System (EFS), Creating a file system using EFS, Mounting EFS on EC2 instances, Sharing Data Volumes between Instances, Monitoring File Systems, Data Backups using EBS Volumes

**UNIT-IV**

Introduction to AWS Database Services, Relational Database Service (RDS), Exploring RDS with a MySQL instance, Importing data into a database, Backing up and restoring databases, Controlling access to a database, Controlling network access and data access, Creating high-availability, Tweaking performance and Monitoring

**UNIT-V**

Introduction to NoSQL databases, DynamoDB, DynamoDB for Developers, Creating a sample application using DynamoDB, Creating tables, Adding data, Retrieving data, Removing data, Modifying data, Auto Scaling

# **SRI VENKATESWARA UNIVERSITY**

**B.Sc. DEGREE COURSE IN CLOUD COMPUTING**

**V SEMESTER - W.E.F. 2022-23**

**COURSE 7A: REST INTEGRATION FOR SAAS**

## **MODEL QUESTION PAPER**

Time: 3 hours

Marks: 75 marks

**Note:** This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A. Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

### **PART – A**

**Answer any *Five* of the following question.**

**(5X5=25M)**

<b>1.</b>	
<b>2.</b>	
<b>3.</b>	
<b>4.</b>	
<b>5.</b>	
<b>6.</b>	
<b>7.</b>	
<b>8.</b>	

**(P.T.O)**

**PART – B**

**Answer All The Questions. Each question carries 10 marks (5X10= 50M)**

9.	(A)  OR  (B)
10.	(A)  OR  (B)
11.	(A)  OR  (B)
12.	(A)  OR  (B)
13.	(A)  OR  (B)

## Practical Syllabus: Course 6B: AWS Compute Services

### Skills Outcomes:

On successful completion of this practical course, student shall be able to:

1. Create S3 buckets for storing different volumes of data
2. Integrate S3 with EC2 instances and use APIs to fetch data from S3 buckets to local computers
3. Understand EBS volumes and Instance stores
4. Understand the basic concepts of File Systems on AWS instances
5. Create and use RDS instances
6. Manipulate data using DynamoDB

### IV. PracticalSyllabus:

1. Creation of S3 buckets and their integration with an EC2 instance
2. Creation of an Elastic File System on an EC2 instance
3. Creation of an RDS instance using MySQL image and execution of database operations
4. Using a DynamoDB instance for CRUD (Create, Read, Update, Delete) operations

### References:

1. Amazon Web Services in Action by Michael Wittig and Andreas Wittig, Released September 2018, Manning Publications, ISBN: 9781617295119
2. AWS Developer Guides
3. Other web sources suggested by the teacher concerned and the college librarian including reading material

### Co-CurricularActivities:

#### a) Mandatory: (Training of students by teacher on field related skills: 15hrs)

1. **ForTeacher:** Training of students by teacher in laboratory and field for a total of 15 hours on understanding various kinds of storage services needed for different activities and estimate the pricing advantages over traditional storage schemes
2. **For Student:** Individuals can visit small or medium business units to understand their storage requirements for performing their IT operations. They need to estimate how AWS storage services can be used for maintaining their data on cloud making sure that sensitive information is not leaked outside. They are also advised to make use of DynamoDB to map unstructured data to run some basic data analytics on the data stored on cloud. They need to submit a 5-page document illustrating the storage model opted for the business unit they visited along with suitable architectural diagrams.
3. Max marks for Field Work Report: 05.
4. Suggested Format for Field work: *Title page, student details, content page, introduction, any three SOAP APIs or Salesforce, invocation mechanism for these APIs, Common issues related to their invocation, Conclusion and Acknowledgements.*
5. Unit tests (IE).

#### b) Suggested Co-CurricularActivities

6. Training of students by related industrialexperts.
7. One Seminar
8. Two Quizzes
9. Infographics on service architectural models.
10. Invited lectures and presentations on related topics by field/industrial experts.

**Suggested Question Paper Model for Practical Examination**  
Semester – V/ Cloud Computing Course – 7B AWS Storage Services  
**Cloud Computing**

Max. Time :3Hrs.

Max. Marks : 50

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- |   |      |
|---|------|
| 1. Demonstration of creation of S3 buckets and integration with an EC2 instance | 5 M  |
| 2. Demonstration of connection to an RDS instance                               | 5M   |
| 3. Execution of various operations on the RD instance                           | 10 M |
| 4. Configuration of access control mechanisms to the RDS instance               | 10 M |
| 5. Record+Viva-voce (10+10)   | 20 M |
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**Submitted by**

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