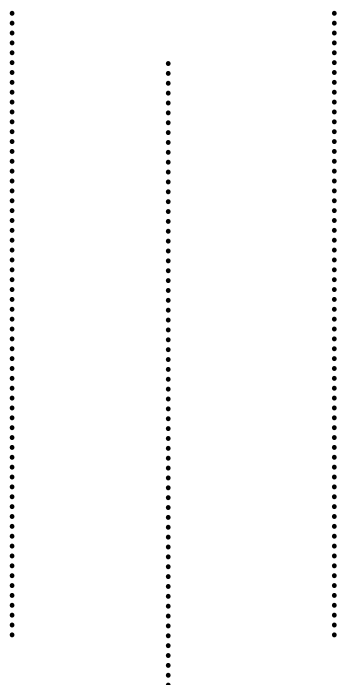*Kathmandu*

# BernHardt College

**Bafal, Ringroad, Kalanki, Kathmandu**

**Tel: 01-5237330/01-5237361**

Name: …………………………..

Syllabus /Model Question/Old Questions

B.Sc. CSIT Eighth Semester

2076

**Course Title: Internship**

**Course no:** CSC-452                         **Full Marks**: 200

**Credit hours**: 6                              **Pass Marks**: 80

**Nature of course**: Project

### Course Synopsis

The students are required to complete a six credit (minimum ten weeks/180 hour long) internship as a part of the course requirement. Industry is a crucial requirement of the Internship course and this will have to be secured before getting started with the course. The work that the students perform during the Internship will have to be supervised by the faculty members as well as by representatives from the participating Industries. The internship experience is expected to enable the students to assist in the resolution of complex problem associated with Database systems.

At the end of the Internship, the student(s) are required to write a report on their internship work. Such a report needs to be structured according to the prescribed format. The Report forms a major aspect of the evaluation of the Internship work.

**Goal**

Main goal is to assist students in focusing their interests, thus aiding in their professional carrier. It gives students the opportunity to re-examine their career objectives and explore the variety of opportunities in the field of computer networking.

**Preparation**

Students, the advisors, and the industry/organization, with which the student team is affiliated, will have to agree on a problem that needs to be addressed during the internship. An internship is designed by the advisor and the student according to mutual interests, needs and availability of related industry/organization. To develop a rewarding program, at the beginning of the internship, the advisor and student are asked to establish an internship plan, in the form of written objectives and goals, and to develop a strategy for attaining those goals. The plan may include a schedule of activities that need to be carried out in order to reach a solution for the problem being addressed. The internship plan is not intended to be rigid. Advisor may be unable

to assess certain responsibilities until the student demonstrates his or her ability. The plan should be flexible and subject to revision. The advisor and student should assess the student's progress

throughout the term of the internship both to evaluate the student's performance, and to establish new directions as needed.

**Role of the Advisor**

Advisors are expected to share their experience, insight, and enthusiasm with the student throughout the internship. They should continually monitor the progress of the student, assessing written and oral communications and guiding the development of the student's technical and managerial skills, effectiveness and presentation of self. Advisors are expected to submit a post-internship evaluation of the student's accomplishments and abilities and of the internship program in general.

**Role of the Student**

In order for the internship to be a mutually beneficial experience, a student should begin with a definition of his/her objectives and specific interests for the minimum of 10-week/180 hour period to ensure that appropriate activities and projects are selected by the advisor and the student. The student will be responsible for the timely completion and professional quality of all activities and projects assigned. The student is expected to speak frequently with the advisor on his/her progress and interest in other projects, as well as to discuss observations and questions about meetings, projects and other activities with which he/she is involved.

The student is required to submit to Advisor, within the first two weeks of the internship, a brief plan for the internship.

**Internship Group Size and document preparation**

☐ Each group must be of maximum 4 Students

☐ Each student should prepare Individual document on the basis of his/her part in the group project.

☐ Supervisors must be assigned to each group

**Domain/Scope of Internship (Project Implementation /Research)**

-Bank

-Hospitals

-Software Companies

-NTC, Ncell and other Telecommunication Sectors

-Government Organizations (IT Related) etc

**Report Format**

APA Format

**Tentative Contents of Report**

- Abstract

- Introduction (organization +Work Done )

- Statement of the problem and Objective

- Literature Review and methodology (Optional)

- System Analysis

- System Design

- Implementation

- System Testing

- Limitation/future enhancement

- Conclusion

- References and Bibliography

**Evaluation Criteria**

Proposal Defense : 10% weight {Evaluated by Supervisor and Mentor} Mid-Term : 30% weight {Evaluated by Supervisor and Mentor} End-Term : 60% weight.

**Proposal Defese (At beginning of the internship)**

- Topic Selection with Proposal (5 of total)

- Presentation (5% of total).

**Mid-Term (After 2 month)**

- Program Design (10% of total)

- Demo Presentation (10% of total).

- Viva (10% of total)

**End-Term (After Completion of internship and before final Exam)**

- Depth of work (15% of total)

- Report (25% of total)

- Viva (10% of total)

- Presentation (10% of total)

Note: External examiner assigned from TU will be present in final presentation. External Examiner along with Supervisors, Mentor will evaluate internship of students. Proportion of the marks will be same for all evaluators.

**Course Title: Data Warehousing and Data Mining**

**Course no: CSC-451**                              **Full Marks: 60+20+20**

**Credit hours: 3**                                 **Pass Marks: 24+8+8**

Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)

**Course Synopsis:** Analysis of advanced aspect of data warehousing and data mining.

**Goals:** This course introduces advanced aspects of data warehousing and data mining, encompassing the principles, research results and commercial application of the current technologies

| Unit | Course content-breakdown | Lecture Hours | Remarks |
|---|---|---|---|
| 1 | **Introduction**<br><br>☐ What motivated Data mining? What is Data Mining?<br><br>☐ Types of databases (Relational database, Data Warehouses, Transactional Database)<br><br>☐ Functionalities of data mining – What kinds of Pattern can be mined?<br><br>☐ Association Analysis, Cluster Analysis, Outlier Analysis, Evolution Analysis<br><br>☐ Stages of Knowledge discovery in database(KDD)<br><br>☐ Setting up a KDD environment<br><br>☐ Issues in Data Warehouse and Data Mining<br><br>☐ Application of Data Warehouse and Data Mining | 5 | |
| 2 | **Data Warehouse for Data mining**<br><br>☐ Differences between operational database systems and data warehouses<br><br>☐ Data Warehouse Architecture<br><br>☐ Distributed and Virtual Data Warehouse<br><br>☐ Data Warehouse Manager<br><br>☐ Data marts, Metadata, Multidimensional data model<br><br>☐ From Tables and Spread Sheets to Data Cubes | 4 | |

| | | | |
|---|---|---|---|
| | ☐ Star schema, Snowflake schema and Fact constellation schema | | |
| 3 | **OLAP technology for Data Mining**<br><br>☐ On-line analytical processing models and operations (drill down, drill up, slice, dice, pivot)<br><br>☐ Types of OLAP Servers: ROLAP versus MOLAP versus HOLAP<br><br>☐ OLTP | 6 | |
| 4 | **Tuning for data warehouse**<br><br>☐ Computation of Data Cubes, modeling<br>☐ OLAP data, OLAP queries<br>☐ Data Warehouse back end tools<br>☐ Tuning and testing of Data Warehouse | 4 | |
| 5 | **Data Mining techniques**<br><br>☐ Data Mining definition and Task<br>☐ KDD versus Data Mining<br>☐ Data Mining techniques, tools and application | 4 | |
| 6 | **Data mining query languages**<br><br>☐ Data mining query languages<br>☐ Data specification, specifying knowledge, hierarchy specification, pattern presentation & visualization specification<br><br>☐ Data mining languages and standardization of data mining | 5 | |
| 7 | **Association analysis**<br><br>☐ Association Rule Mining (Market basket analysis)<br>☐ Why Association Mining is necessary?<br>☐ Pros and Cons of Association Rules<br>☐ Apriori Algorithm | 6 | |
| 8 | **Cluster analysis, Classification and Predication**<br><br>☐ What is classification? What is predication? | 7 | |

| | | | |
|---|---|---|---|
| | ☐ Issues regarding classification and prediction (Preparing the data for classification and prediction, Comparing classification methods) <br> ☐ Classification by decision tree induction (Extracting classification rules from decision trees) <br> ☐ Bayesian Classification <br> ☐ Classification by back propagation <br> ☐ Introduction to Regression (Types of Regression) <br> ☐ Clustering Algorithm (K-mean and K-Mediod Algorithms) | | |
| 9 | **Advanced concepts in data mining** <br> ☐ Mining Text Databases <br> ☐ Mining the World Wide Web <br> ☐ Mining Multimedia and Spatial Databases | 4 | |

**Laboratory:**

1. Creating a simple data warehouse

2. Concepts of data cleaning and preparing for operation

3. Implementing classification and clustering algorithms in any programming language

4. Association rule mining though data mining tools

5. Data Classification through data mining tools

6. Clustering through data mining tools

7. Data visualization through data mining tools

**Text Books:**

1. Data Mining Concepts and Techniques, Morgan Kaufmann J. Han, M Kamber Second Edition ISBN: 978-1-55860-901-3

2. Data Warehousing in the Real World – Sam Anahory and Dennis Murray, Pearson Edition Asia.

**References:**

☐ Data Mining Techniques – Arun K Pujari, University Press.

☐ Data Mining- Pieter Adriaans, Dolf Zantinge

☐ Data Mining, Alex Berson,Stephen Smith,Korth Theorling,TMH.

☐ Data Mining, Adriaans, Addison-Wesley Longman.

**Model Question**

Bachelor Level/ Fourth Year/Eight Semester/Science      FM: 60    PM: 24      Time: 3 Hours

**Data Warehousing and Data Mining** (CSC-451)

**Candidates are required to give their answers in their own words as far as practicable.**
**The figures in the margin indicate full marks.**
**Group-A**

**Long Answer Questions** (**Attempt any Two** questions)                                      [2x10=20]

1. Suppose that a data warehouse for Big University consists of the following four dimensions: student, course, semester, and instructor, and two measures count and avg-grade. When at the lowest conceptual level (e.g., for a given student, course, semester, and instructor combination), the avg-grade measure stores the actual course grade of the student. At higher conceptual levels, avg-grade stores the average grade for the given combination.

   Draw a snowflake schema diagram for the data warehouse.

   Starting with the base cuboid [student, course, semester, instructor], what specific OLAP operations (e.g., roll-up from semester to year) should one perform in order to list the average grade of CS courses for each Big University Student.

   If each dimension has five levels (including all), such as "student < major < status < university < all", how many cuboids will this cube contain (including the base and apex cuboids)?

2. A= {A1, A2, A3, A4, A5, A6}, Assume σ = 35%. Use A priori algorithm to get the desired solution.

| A1 | A2 | A3 | A4 | A5 | A6 |
|----|----|----|----|----|----|
| 0  | 0  | 0  | 1  | 1  | 1  |
| 0  | 1  | 1  | 1  | 0  | 0  |
| 1  | 0  | 0  | 1  | 1  | 1  |
| 1  | 1  | 0  | 1  | 0  | 0  |
| 1  | 0  | 1  | 0  | 1  | 1  |
| 0  | 1  | 1  | 1  | 0  | 1  |
| 0  | 0  | 0  | 1  | 1  | 0  |

| 0 | 1 | 0 | 1 | 0 | 1 |
|---|---|---|---|---|---|
| 1 | 0 | 0 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |

3. What kind of data preprocessing do we need before applying data mining algorithm to any data set. Explain binning method to handle noisy data with example.

## Group- B

**Short Answer Questions (Attempt any <u>Eight</u> questions)**                [8x5=40]
**<u>Question number 13 is compulsory.</u>**

4. Explain the use of frequent item set generation process.                [5]

5. Differentiate between data marts and data cubes.                [5]

6. Explain OLAP operations with example?                [5]

7. List the drawbacks of ID3 algorithm with over-fitting and its remedy techniques        [5]

8. Write the algorithm for K-means clustering. Compare it with k-nearest neighbor algorithm.                [5]

9. What is text mining? Explain the text indexing techniques.                [5]

10. Describe genetic algorithm using as problem solving technique in data mining.        [5]

11. What do you mean by WWW mining? Explain WWW mining techniques.        [5]

12. What is DMQL? How do you define Star Schema using DMQL?        [5]

13. Write short notes (Any Two)                [2x2.5=5]

   a) Text Database Mining
   b) Back propagation Algorithm
   c) Regression
   d) HOLAP

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**Course Title: Cloud Computing**
**Course No:** CSC-458                     Full Marks: 60+20+20
**Credit Hours:** 3                        Pass Marks: 24+8+8

**Nature of the course:** Theory (3Hrs.) + Lab (3Hrs.)

**Course synopsis:** This course gives an introduction to cloud computing and its techniques. The topics covered include; introduction to cloud computing, cloud architecture, cloud service models, Service Oriented Architectures, security in cloud computing, disaster management in clouds.

**Goal**: Cloud computing has become a great solution for providing a flexible, on-demand, and dynamically scalable computing infrastructure for many applications. Cloud computing also presents a significant technology trends, and it is already obvious that it is reshaping
information technology processes  and the  IT  marketplace. Thus objective of this  course  is
to introduce the aspects of cloud computing issues.

**Course Contents:**

**Unit1: Introduction**                                      **10 Hrs.**

Defining the Cloud, The Emergence of Cloud Computing, Cloud-Based Services, Grid Computing or Cloud Computing, Components of Cloud Computing, Cloud Computing Deployment Models: Public, Private, Hybrid, Benefits of Using a Cloud Model, Legal Issues in Using Cloud Models, Characteristics of Cloud Computing, Evolution of Cloud Computing, Challenges for the Cloud computing, Grid Computing, Distributed Computing in Grid and Cloud

**Unit2: Cloud Service Models**                              **15 Hrs.**

Communication-as-a-Service (CaaS): Advantages of CaaS, Fully Integrated, Enterprise-Class Unified Communications, Infrastructure-as-a-Service (IaaS): Modern On-Demand Computing,

Amazon's Elastic Cloud, Amazon EC2 Service Characteristics, Monitoring-as-a-Service (MaaS), Protection Against Internal and External Threats, Platform-as-a-Service (PaaS): The Traditional On-Premises Model, The New Cloud Model, Key Characteristics of PaaS, Software-as-a-Service (SaaS): SaaS Implementation Issues, Key Characteristics of SaaS, Benefits of the SaaS Model, Jericho Cloud Cube Model

**Unit 3: Building Cloud Networks    9 Hrs.**

Evolution from Managed service providers (MSP) to Cloud Computing, Single Purpose architectures to multi-purpose architectures, Data center virtualization, Cloud data center, Service Oriented
Architectures (SOA), Combining and SOA, Characterizing SOA, Open Source Software in data centers

 **Unit 5 : Security in Cloud Computing**                     **11 Hrs.**

Cloud Security Challenges, Software-as-a-Service Security: Security management, Risk Management,

Security Monitoring and Incident Response, Security Architecture Design, Vulnerability Assessment, Data Privacy and Security, Application Security, Virtual Machine Security, disaster Recovery, Disasters in cloud, Disaster management

**Laboratory work:** As a part of lab work, the students are highly encouraged
- □ To simulate the concept of virtualization using virtualization programs/systems.
- □ To understand and practice examples of cloud services and applications.
- □ To understand and implement distributed storage and security issues in cloud computing.

**Reference Books**:

1. ***Cloud Computing: Implementation Management and Security***, John W. Rittinghouse and James F. Ransome (Recommended for Unit 1, 2, 3 4)

2. ***Cloud Application architecture***, George Reese (Recommended for Unit 4)

3. ***Cloud Computing for Dummies***, Judith Hurwitz, Robin Bloor, Marcia Kaufman, Fern Halper(Recommended for Unit 3)

4. ***Handbook of cloud computing***, Borko Furht, Armando Escalante (Recommended for Unit 1)

5. **Cloud Computing and SOA Convergence in your Enterprise**, a step by step guide, David S. Linthicum (Recommended for Unit 1, 2, 3)

**Course Title: Geographical Information System**
**Course no**: CSC-459                                   Full Marks: 60+20+20
**Credit hours**: 3                                          Pass Marks: 24+8+8

**Nature of course**: Theory (3 Hrs.) + Lab (3 Hrs.)

**Course Synopsis:** Basic concepts of Geographical Information System

**Goal:** The course covers about spatial data modelling and database design, capturing the real world, spatial analysis and visualization, overview of open GIS

**Course Contents:**

**Unit 1: Introduction**                                              **6hrs.**
      1.1 Overview, History and concepts of GIS
      1.2  Scope and application areas of GIS
      1.3  Purpose and benefits of GIS
      1.4 Functional components of GIS
      1.5 Importance of GPS and remote sensing data in GIS

**Unit2: Digital mapping concept**                                    **3 hrs.**

      2.1 Map concept: map elements, map layers, map scales and representation
      2.2 Map projection: coordinate system and projection system

**Unit 3: spatial data modeling and database design**                 **9 hrs.**

      3.1 introduction to geographic phenomena and data modeling
      3.2 spatial relationships and topology
      3.3 scale and resolution
      3.4  vector, raster and digital terrain model
      3.5 Spatial database design with the concepts of geodatabase.

**Unit 4: capturing the real world**                                  **8hrs.**

      4.1 different methods of data capture
      4.2 map projection and spatial reference
      4.3 data preparation, conversion and integration
      4.4 quality aspects of spatial data
      4.5 GPS
      4.6 Remote Sensing

**Unit 5: spatial analysis and visualization**                        **7hrs.**
      5.1 spatial analysis
          i.   overlay
          ii.  buffering

5.2 map outputs and its basic elements

## Unit 6: introduction to spatial data infrastructure                     8hrs.

6.1 SDI concepts and its current trend
6.2 The concept of metadata and clearing house
6.3 Critical factors around SDIs

## Unit 7: Open GIS                                                        4hrs.

7.1 Introduction of open concept in GIS
7.2 Open source software for spatial data analysis
7.3 Web Based GIS system
7.4 System Analysis and Design with GIS

**Laboratory work:** The lab should cover at least the concepts given the chapters

**Reference books:**

**1-** Principles of geographic information systems: An introductory textbook, international institute for Geo-information science and Earth observation, the Netherlands- By rolf De By, Richard A. knippers, yuxian sun

**2-** ESRI guide to GIS analysis Andy Mitchell, ESRI press, Red lands **3-** GIS Cook BOOK

Tribhuvan University

**Institute of Science and Technology**

2069

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Bachelor Level/ Fourth Year/ Eight Semester/ Science                    Full Marks: 60

**Computer Science and Information Technology (CSc. 451)**        Pass Marks: 24

(Data warehousing and Data Mining)                                            Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable.*

*All questions carry equal marks.*

Group A

**Attempt any two questions.                (10\*2=20)**

1. Explain the architecture of data mining system with block diagram.
2. Define clustering. Explain with example of the partitioning and hierarchical methods.
3. Explain the architecture and implementation of data warehouse with example.

## **Group B**

**Attempt any eight questions. (Question No. 13 is compulsory) (8\*5=40)**

4. What do you mean by knowledge discovery in database (KDD)?
5. Explain the application of data warehouse and data mining.
6. Differentiate between OLAP and OLTP.
7. Explain the data mining techniques.
8. Explain the aprion algorithm.
9. Explain the K-Mediod algorithm.
10. Mention the spatial database and its features.
11. What id data cube? Explain with example.
12. Explain the data mining languages.
13. Write short notes (any two)
    a. OLAP queries      b. Snow flakes
    c. K-mean              d. Mining text databases

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2071

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Bachelor Level/ Fourth Year/ Eight Semester/ Science                     Full Marks: 60

**Computer Science and Information Technology (CSc. 451)**          Pass Marks: 24

(Data warehousing and Data Mining)                                      Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable.*

*All questions carry equal marks.*

### Group A

**Attempt any two questions.**                          **(2*10=20)**

1. What are the key steps in knowledge discovery in database? Explain.
2. Explain the functionalities and classification of data mining system with example.
3. Explain about the architecture and implementation of data warehouse with example.

### Group B

**Attempt any eight questions.**                          **(8*5=40)**

4. What are the stages of knowledge discovery in database (KDD)?
5. List down the functionality of metadata.
6. Differentiate between OLAP and OLTP.
7. Explain the multidimensional data model.
8. List down the data mining tools.
9. Write down the two measures of association rule.
10. What is the objective of K-mears algorithm?
11. Explain the application of spatial database.
12. Explain the methods of mining multimedia database.
13. Write short notes (any two):
    a. MOLAP
    b. Data cubes
    c. Snowflakes
    d. Regression

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2071

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Bachelor Level/ Fourth Year/ Seventh Semester/ Science       Full Marks: 60
**Computer Science and Information Technology (CSc. 451)**    Pass Marks: 24
**(Data Warehousing and Data Mining)**                        Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable.*

## Group - A

**Attempt any <u>two</u> Questions       (10 x 2 = 20)**

1. What do you mean by representative object based clustering technique? Explain in detail with example.
2. Explain the various data mining task primitives in detail.
3. Explain the architecture of data mining system with schematic diagram.

## Group - B

**Attempt any <u>eight</u> Questions.       (8 x 5 = 40)**

4. What are the basic stages of KDD?

5. Differentiate between DBMS and Data Warehouse.

6. Explain the distributed and virtual data warehouse.

7. Explain the data cube with example.

8. What are the data warehouse back and tools? Explain.

9. Explain the data mining tasks performed on a text database.

10. Define the spatial database and its features.

11. Differentiate between OLTP and OLAP.
12. Explain the Aprion Algorithm.
13. Write short notes (Any Two)
    a) Stars
    b) HOLAP
    c) Data Specification
    d) Mining and world wide web (WWW)

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2072

Bachelor Level / Forth Year /Eighth Semester/Science                     Full Marks: 60
**Computer Science and Information Technology-(CSc. 451)**          Pass Marks: 24
**(Data warehousing and Data mining)**                                        Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable.* The figures in the margin indicate full marks.

## Group A

**Attempt any two questions.**                                                    (2x 10=20)

1. Differentiate between Data-Warehouse and Data mining. Explain the stages of knowledge discovery in database with example.

2. What do you mean by clustering? Explain the k-mean and k-mediod algorithm with example.

3. Explain the data warehouse architecture. Differentiate between distributed and virtual data warehouse.

## Group B

**Attempt any eight questions.**                                                 (8x5=40)

4. Explain the multidimensional data model with example.
5. Differentiate between OLTP and OLAP.
6. Explain the tuning and testing of Data Warehouse.
7. Differentiate between KDD and Data mining.
8. Explain the data mining query language with example.
9. What are the advantages and disadvantages of association rules?
10. What are the types of Regression? Explain.
11. Explain the Aprion Algorithm.
12. Explain the application of mining used in www.
13. Write short notes **(any two):**
    a) HOLAP
    b) Hierarchy specification
    c) Spatial Database

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2073
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Bachelor Level / Forth Year /Eighth Semester/Science
**Computer Science and Information Technology-(CSc. 451)**
**(Data warehousing and Data mining)**

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable.*
*The figures in the margin indicate full marks.*

## Group A

**Attempt any two questions.**                                    (2×10=20)

1. Differentiate between data warehouse and data mining.

2. Explain the DBMS vs. Data warehouse.

3. Explain the K-mean and K-Mediod Algorithm with example.

## Group B

**Attempt any eight questions.**                                 (8×5=40)

4. Differentiate between Data marks and Meta data.

5. What do you mean by virtual data warehouse?

6. Explain the tuning and testing of data warehouse.

7. Differentiate between KDD and data mining.

8. Explain the data mining query language.

9. Explain the Aprion Algorithm.

10. Explain the types of regression.

11. Explain the association rules with advantages and disadvantages.

12. Explain the mining text databases.

13. Write short notes (**any two**):
    a) Data cubes
    b) HOLAP
    c) Spatial Database

CSc. 451-2075 ✡

Tribhuvan University
**Institute of Science and Technology**
2075
✡

Bachelor Level / Forth Year /Eighth Semester/Science            Full Marks: 60
**Computer Science and Information Technology-(CSc. 451)**      Pass Marks: 24
**(Data warehousing and Data mining)**                          Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable.*
*The figures in the margin indicate full marks.*

### Group A

**Attempt any two questions.**                                 [2×10=20]

1. List some issues of multimedia mining. Describe how back propagation is used in classification.

   [3 + 7]

2. Describe how bitmap and join indexing are used to represent OLAP data. Explain the different components of data warehouse.                        [4 + 6]

3. Give any two types of association rules with examples. Trace the results of using the Apriori algorithm on the grocery store example with support threshold 2 and confidence threshold 60%. Show the candidate and frequent itemsets for each database scan. Enumerate all the final frequent itemsets. Also indicate the association rules that are generated.        [4 + 6]

| Transaction_ID | Items |
|---|---|
| T1 | HotDogs, Buns, Ketchup |
| T2 | HotDogs, Buns |
| T3 | HotDogs, Coke, Chips |
| T4 | Chips, Coke |
| T5 | Chips, Ketchup |
| T6 | HotDogs, Coke, Chips |

### Group B

**Attempt any eight questions.**                               [8×5=40]
**Question No. 13 is compulsory.**

4. What is the purpose of cluster analysis in data mining? Explain.    [5]

5. How does KDD differ with data mining? Describe the stages of data mining.    [1 + 4]

6. Explain OLAP operations with examples.                      [5]

7. Explain the primitives of data mining query language.       [5]

8. How different schema are used to model data warehouse? Explain.    [5]

9. Describe the significances of pre computation of data cube.    [5]

d)

CSc. 451-2075 ✡

10. How text mining can be used in social networking? Give your own opinion. [5]

11. Describe any five applications of data mining. [5]

12. How ID3 algorithm can be used as attribute selection while building decision tree? Explain. [5]

13. Write short notes on (**Any TWO**): [2.5 + 2.5]
    a. Outlier Analysis
    b. Data warehouse back end tools
    c. Virtual data warehouse
    d. Market basket analysis

Tribhuvan University

**Institute of Science and Technology**

2069

Bachelor Level/ Fourth Year/ Eight Semester/ Science                  Full Marks: 60

**Computer Science and Information Technology (CSc. 458)**                  Pass Marks: 24

(Cloud Computing)                  Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable.*

*All questions carry equal marks.*

**Attempt all questions.**                  **[10*6=60]**

1. Explain the cloud computing model and its benefits.
2. Explain the cloud deployment models.
3. What are the differences between public clouds private clouds?
4. What are the implementation issues on SAAS? Explain.
5. Explain the platform as a service and its challenges.
6. Explain the data center virtualization.
7. What do you mean by service oriented architecture (SOA)? Explain with example.
8. How can you design the security architecture in cloud? Explain.
9. Explain the process of implementation of Network Intrusion detection.
10. Explain the disaster recovery planning of cloud computing.

Tribhuvan University

**Institute of Science and Technology**

2071

Bachelor Level/ Fourth Year/ Eight Semester/ Science                Full Marks: 60

**Computer Science and Information Technology (CSc. 458)**        Pass Marks: 24

(Cloud Computing)                                                                         Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable.*

*All questions carry equal marks.*

**Attempt all questions.**                        **[10*6=60]**

1. How can you define cloud service? Describe the characteristics of a cloud service.
2. Differentiate between each of private, public, and hybrid cloud models with suitable examples.
3. What is the role of Early Detection and Intelligent Log Centralization and Analysis services in Monitoring-as-Service (MaaS) Model?
4. What are the benefits of using Software-as-a-Service(SaaS) Model? Briefly discuss about the maturity levels of SaaS Architecture.
5. What do you mean by Service Oriented Architecture (SOA)? How could services get benifited by SOA?
6. What are the Managed Services Providers (MSP)? Discuss the evolution of MSP Model to cloud Computing.
7. What is the need for data center virtualization? What are the benefits of data center virtualization?
8. Explain the different approaches for enforcing host security in a cloud environment.
9. What do you mean by disaster recovery? How recovery point objective differs from recovery time objective?
10. Write short notes on (any two):
    a. Data Segmentation and Cradential Management
    b. Role of open source software in cloud computing
    c. Grid Computing

Tribhuvan University
**Institute of Science and Technology**
2072

Bachelor Level / Fourth Year /Eight Semester/Science　　　　　Full Marks: 60
**Computer Science and Information Technology-(CSc.458)**　　Pass Marks: 24
**(Cloud Computing)**　　　　　　　　　　　　　　　　　　Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable. The figures in the margin indicate full marks.*

**Attempt all questions.**　　　　　　　　　　　　　**(6x10=60)**

1. Explain the components of cloud .computing.

2. Explain the platform as — a service (Paas) and its characteristics.

3. Explain the cloud data center and its applications.

4. Explain the software as service and its characteristics.

5. Explain the service provided by the amazon EC2 service from user perspective.

6. Explain the service oriented architecture (SOA) and its characteristics.

7. Explain the Jericho cloud cube model.

8. Explain the cloud security challenges.

9. What do you mean by network Intrusion detection?

10. Explain the disaster recovery planning in cloud system.

Tribhuvan University
**Institute of Science and Technology**
2073
✡

Bachelor Level / Fourth Year /Eight Semester/Science
**Computer Science and Information Technology-(CSc.458)**
**(Cloud Computing)**

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable.*
The figures in the margin indicate full marks.

**Attempt all questions.**

1. What do you mean by cloud? Describe about the basic characteristics of cloud.                    [1+5]

2. What type of deployment models can be adopted in cloud computing. Describe each of them with suitable example.                    [6]

3. Discuss the capabilities that the cloud users can get through Platform-as-a-Service (PaaS). Also mention the key characteristics of PaaS.                    [3+3]

4. How the Jericho Cloud Cube model dimensions like *perimeterised, de-perimeterised* and *proprietary*, open differentiate the cloud formations from each other?                    [6]

5. What do you mean by Service Oriented Architecture? How can you characterize Service Oriented Architecture?                    [2+4]

6. What are the Managed Service Providers (MSP)? Discuss the evolution of MSP Model to Cloud Computing.                    [2+4]

7. Define virtualization. What is the role of virtualization in cloud computing?                    [2+4]

8. What do you mean by an intrusion in a cloud network? How intrusions in cloud networks are detected?                    [2+4]

9. How data segmentation and credential management ensures host security in a cloud? Explain with suitable example.                    [6]

10. Write short notes on (**any two**):                    [3x2=6]
    a) Risk Assessment in Cloud
    b) Role of open source software in cloud computing
    c) Grid Computing

CSc.458-2075 ✡

Tribhuvan University
**Institute of Science and Technology**
2075
✡

Bachelor Level / Fourth Year /Eight Semester/Science          Full Marks: 60
**Computer Science and Information Technology-(CSc.458)**     Pass Marks: 24
**(Cloud Computing)**                                         Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable.*
*The figures in the margin indicate full marks.*

**Attempt all questions.**

1. How cloud computing is different than traditional on premise computing? How properties like elasticity and scalability influence cloud computing?          [3+3]

2. How cloud services can be deployed? In which scenario hybrid cloud model is better to deploy? How it can be used in cloud?          [1+3+2]

3. What is the use of grid computing? How computing in grid architecture differs from cloud architecture? Explain.          [2+4]

4. Mention the characteristics of Software-as-a-Service (SaaS). What implementation issues should be considered in SaaS?          [2+4]

5. What computing services are provided under PaaS? Discuss, with example, the concepts of perimeterized and deperimeterized dimensions in Jericho Cube Model.          [1+5]

6. What services can be provided under Communication-as-a-Service? Mention the advantages of using Communication as-a-Servce Cloud Model.          [3+3]

7. How data center virtualization is done? Discuss the various building blocks of data center.          [2+4]

8. Define SOA. How cloud services can be benefited by using the concepts of Service Oriented Architecture?          [6]

9. Why intrusion detection systems are implemented in cloud networks? How anamoly based intrusion detection system differs from signature based?          [3+3]

10. Define recovery point objective. How the geographical redundancy and organizational redundancy are used in cloud disaster recovery?          [2+4]

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2069

Bachelor Level/ Fourth Year/ Eight Semester/ Science　　　　　　Full Marks: 60

**Computer Science and Information Technology (CSc. 459)**　　　Pass Marks: 24

(Geographical Information System)　　　　　　　　　　　　　　Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable.*

*All questions carry equal marks.*

**Attempt any six questions.**　　　　　　　**[10\*6=60]**

1. Explain the GIS, applications and its benefits.
2. Why digital mapping is necessary in GIS? Explain with practical example.
3. Differentiate between geographical phenomena and data modeling.
4. Explain the spatial database design with example.
5. What do you mean by spatial reference? Explain the quality aspects of spatial data.
6. Explain the example of metadata and clearing house.
7. Explain the system analysis and design of GIS.
8. Write short notes (any two):
    a. MAP elements
    b. Spatial relationships
    c. Geo database
    d. SDI

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2071

Bachelor Level/ Fourth Year/ Eight Semester/ Science                    Full Marks: 60

**Computer Science and Information Technology (CSc. 459)**         Pass Marks: 24

(Geographical Information System)                                                  Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable.*

*All questions carry equal marks.*

**Attempt any six questions.**                    **[10*6=60]**

1. Define GIS. Describe the role of GIS in mountainous country like Nepal. Support your answer with a reference of an application.
2. What are various coordinate systems used in GIS applications? Describe them in brief.
3. What are raster and vector data? Differentiate between their properties with advantages and disadvantages.
4. What are various sources of GIS data? Describe methods of data capture.
5. What do you mean by spatial analysis? How do you perform the raster overlay operation using relational operators? Explain with example.
6. What is GPS? How does it work? What are various types of errors related to GPS data?
7. Explain how does a clearinghouse works? What problems do you face during the spatial data sharing?
8. Write short notes on (any two):
    a. DTM
    b. Remote Sensing Data
    c. Open GIS
    d. Layer

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2072

Bachelor Level / Fourth Year /Eight Semester/Science          Full Marks: 60
**Computer Science and Information Technology-(CSc.459)**          Pass Marks: 24
**(Geographical Information System)**          Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable.*
The figures in the margin indicate full marks.

**Attempt any six questions.**          **[10x6=60]**

1. Explain the history development of GIS. What are the application GIS?

2. Explain the mapping projection with example.

3. Explain the spatial data modeling with example.

4 Explain the GPS and remote sensing with example.

5. Why is spatial analysis important during the GIS implementation? Explain.

6. What do you mean by metadata? Explain the critical factors of spatial data infrastructure (SDI).

7. Explain the web based GIS system with example.

8. Write short notes on **(any two):**          [5+5]

   a) Map layers
   b) Digital terrain model
   c) ITRS
   d) Buffering

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2073
✡

Bachelor Level / Fourth Year /Eight Semester/Science          Full Marks: 60
**Computer Science and Information Technology-(CSc.459)**     Pass Marks: 24
**(Geographical Information System)**                        Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable. The figures in the margin indicate full marks.*

**Attempt any six questions.**                                          [10x6=60]

1. Define GIS as an Information System. How a country like Nepal can benefit from GIS? Describe its application in Agriculture.          [2+4+4]

2. What is distortion? Describe various types of Map Projections along with free hand drawing.          [2+8]

3. What are raster and vector data? Differentiate between their properties with advantages and disadvantages.          [2+8]

4. What are various sources of GIS data? Describe methods of data capture.          [2+8]

5. What is a spatial overlay operator? Explain neighborhood functions that are being implemented in GIS software for analysis.          [4+6]

6. Define Geo Database. Explain characteristics of a good database design.          [2+10]

7. Explain how does a clearinghouse works? What problems do you face during the spatial data sharing?          [5+5]

8. Write short notes on (**any two**):          [5+5]
   (a) Functional Component of GIS
   (b) UTM
   (c) Map Elements
   (d) Open GIS

CSc.459-2075 ✡

Tribhuvan University
**Institute of Science and Technology**
2075
✡

Bachelor Level / Fourth Year /Eight Semester/Science     Full Marks: 60
**Computer Science and Information Technology-(CSc.459)**     Pass Marks: 24
**(Geographical Information System)**     Time: 3 hours.

*Candidates are required to give their answers in their own words as for as practicable.*
*The figures in the margin indicate full marks.*

**Attempt any six questions.**     [10x6=60]

1. What is GIS? Explain the uses of GIS in newly formed Municipality/Rural municipality under new federal system in Nepal. How do you suggest to use for their planning work.

2. What do you understand by Spatial Data Model? Differentiate between Coordinate system and Projection system.

3. What do you understand by earth features? What are the different data models of representing the earth features.

4. What is projection? How it is different from MAP? Explain Scale Factor.

5. What is geocoding? Explain spatial analysis with example.

6. What is Geo Spatial Metadata? Explain the various components of Metadata.

7. What is distortion in projection? What are different types of distortation in projections.

8. Write short notes on (**any two**):

   (a) Precision vs Accuracy

   (b) Buffer and Overlaying

   (c) GPS Vs GIS