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Approved by AICTE, New Delhi, Govt. of Maharashtra
(An Autonomous Institution Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur)
Department of Artificial Intelligence & Machine Learning

Session 2025-26(Even Semester)

CASE STUDY ON INNOVATIVE TEACHING LEARNING

SUBJECT: DATABASE MANAGEMENT SYSTEM

FOURTH SEMESTER

Introduction

A **Database Management System (DBMS)** is software that helps users create, manage, and organize data in a structured way. It allows efficient storage, retrieval, updating, and deletion of data while ensuring data security, integrity, and consistency. DBMS acts as an interface between the user and the database, making data handling easier and more reliable.

Context

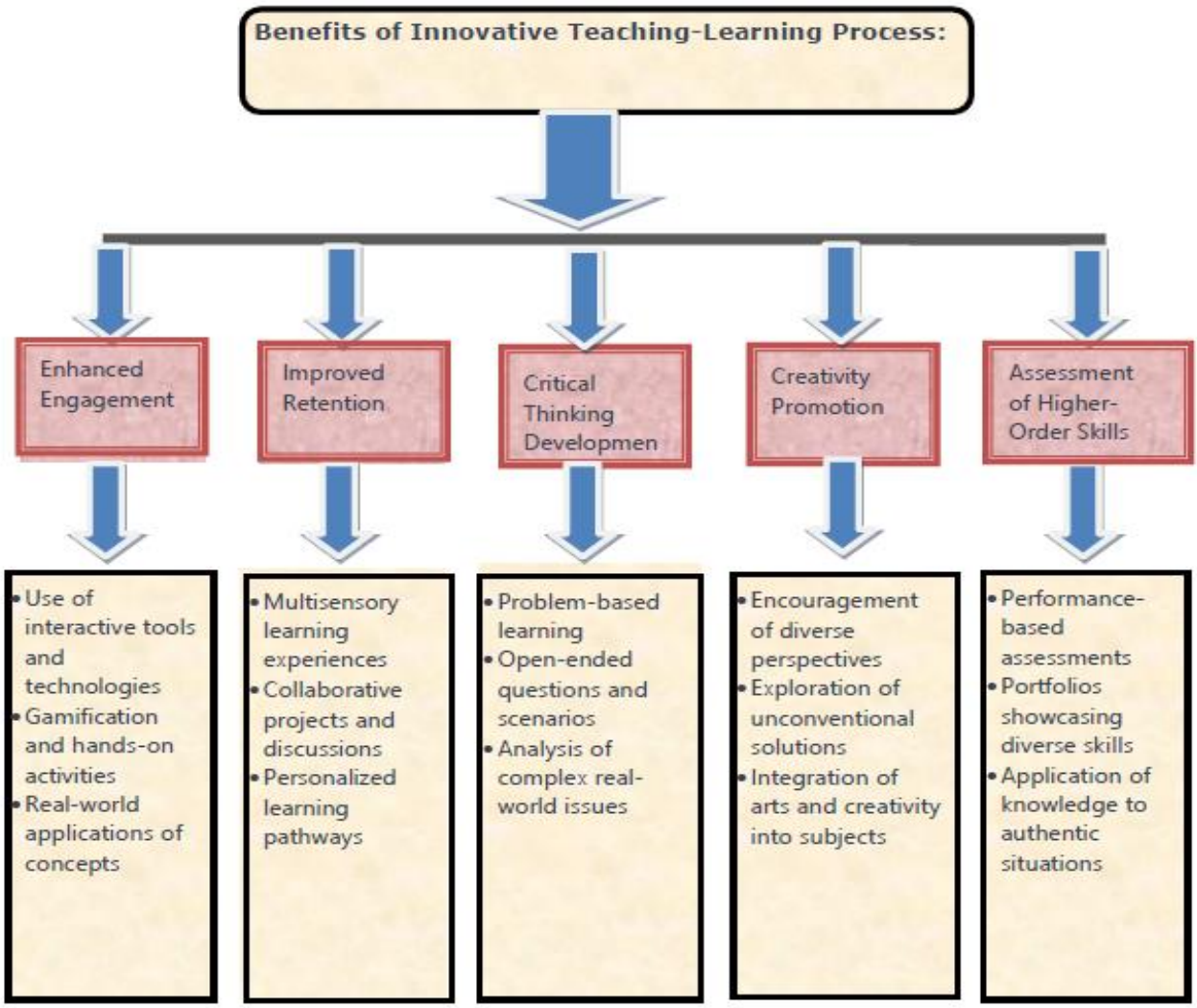
In today's digital world, a **Database Management System (DBMS)** plays a crucial role in managing large amounts of data efficiently. It is widely used in applications like banking, education, healthcare, and e-commerce to store and process data securely. DBMS ensures quick access, reduces data redundancy, and supports decision-making by providing accurate and organized information.

Course Outcomes

	Course Outcomes
CO1	Explain database architectures, data models, and emerging database technologies including distributed and cloud databases.
CO2	Implement database models using ER/EER/UML diagrams and utilize agile tools such as Jira for effective project tracking and manual testing.
CO3	Analyze database schemas for redundancy, dependencies and normalization to produce efficient relational designs.

CO4	Evaluate optimized SQL queries using advanced operations, triggers, and indexing, and their performance with testing and automation tools.
CO5	Implement transaction management and concurrency control mechanisms ensuring data consistency and recovery using modern monitoring and DevOps database tools.

Benefits



Innovative Teaching Learning

1) Flipping Classrooms: Assessment Conducted on 19/02/2026

Aim:
Increase student engagement and learning by selecting topics taught in class and presenting them concept-wise with industrial or real-life applications.

Objective:

- To brainstorm and explore ideas about concepts and problems.
- To provide a better understanding of connections between ideas and concepts.

Methodology:

- Select topics with industrial or real-life applications based on class teaching.
- Gather information from internet sources, reference books, and classroom teaching.
- Students will present topics using PPT or on-board techniques.
- After the presentation, a Q&A session will be conducted by other students.

Parameter Table

SR. NO	Criteria	Excellent (4 points)	Very Good (3 points)	Satisfactory (2 points)	Poor (1 point)
1	Selection of topic	Topic with complexity and research content	Topic with information, diagrams, mathematical expressions	Small topic with diagrams or formula	Small topic without diagrams or expressions
2	Gathering Information	Extensive information from internet, class teaching, industrial applications	Some information from internet and class teaching	Points covered from classroom explanation	Only important points, incomplete
3	Usage of Board/Presentation /Confidence	Excellent presentation, confidence,	Good presentation, average	Proper presentation, limited topic	Prepared but not presented properly

		strong knowledge	confidence	knowledge	
4	Q&A Session	Accurate answers for every question	Answers all but not accurately	Answers more than one but not exact	Answers only one

Conclusion:

- Easier communication of thought processes.
- Better organization of ideas and concepts.
- Improved confidence and learning interest.

Flipping Classroom based on unit one

PO	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12
Assessment	✓	✓		✓	✓			✓	✓	✓		✓

Table-Po Mapped with Activity

SUBJECT: SOFTWARE ENGINEERING AND PROJECT MANAGEMENT

FOURTH SEMESTER

Introduction

Software Engineering and Project Management (SEPM) is a subject that focuses on the systematic development, design, testing, and maintenance of software along with effective planning and management of software projects. It covers software development life cycle (SDLC), project planning, scheduling, risk management, and quality assurance to ensure successful and efficient software delivery.

Context

In the modern software industry, **Software Engineering and Project Management (SEPM)** plays a vital role in developing high-quality software within time and budget constraints. It is widely used in IT companies to plan, execute, and manage software projects efficiently. SEPM ensures proper coordination, risk handling, and quality control, helping teams deliver reliable and scalable software solutions.

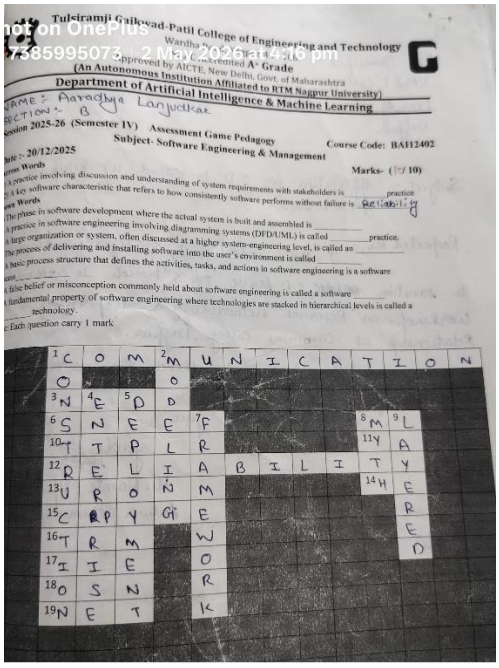
Course Outcomes

	Course Outcomes
CO1	Apply the Knowledge of Basic Software Engineering Principles and Practices.
CO2	Analyze Fundamentals of Software Process Models.
CO3	Elaborate Architectural styles and patterns.
CO4	Construct Software Testing Strategies, Unit Testing, System Testing and Product Metrics.
CO5	Demonstrate Steps for Improving the Software Quality.

Innovative Teaching Learning

2) Game pedagogy based on unit one

Assessment one for the subject **SEPM** is conducted using **Game-based pedagogy**. The subject includes problem-based questions and key concepts designed to enhance students' engagement and interest. A **word puzzle game** was selected as the teaching method on date–20/12/2025, where each answer in the game is linked with SEPM-related concepts. This approach integrates educational gaming into the teaching–learning process, making learning interactive and engaging. It helps improve students' understanding of key concepts, enhances retention, and promotes active participation, ultimately leading to better learning outcomes.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Department of Artificial Intelligence & Machine Learning
NAME: Aaradhya Lanjewar
SECTION:- B
Session 2025-26 (Semester IV) Assessment Game Pedagogy Course Code: BAI12402
Subject- Software Engineering & Management
Date :- 20/12/2025 Marks- (/ 10)
Each question carry 1 mark


TULSIRAMJI GAIKWAD-PATIL College of Engineering & Technology
DTE CODE 4151
3.32 CGPA
Department of Artificial Intelligence and Machine Learning
Session 2025-26
Class Assessment Technical Poster Presentation Evaluation Sheet CO2
Course Name –Software Engineering & project Management
Course Code-BAI12402

		Clarity and relevance (4)	Visual Hierarchi (4)	Recent information on topic (4)	Communication and confidence (4)	Question answer session (4)	Marks out of (20)	Avg Marks (2)	Signature of student
1	Aachal Kewalram Harnikhede								
2	Aanandi Ashok Chaurawar								
3	Aarya Vikas Amrute								
4	Aaswari Harshvardhan Dhole								
5	Aditi Kailas Dhakenkar								
6	Anjali Devidas Chavare								
7	Arya Pravin Kolapare								
8	Astha Pintu Deanwalkar								
9	Dhanlaxmi Naresh Ukey								
10	Dipali Ganesh Sarode								
11	Dipali Naresh Nandanwar								
12	Dipti Dilip Farkade								
13	Divya Lalchand Ukey								
14	Divya Mukesh Chawda								
15	Divyanka Devendra Gaikwad								
16	Doisy Kiran Raphoric								
17	Dolly Ramesh Diwate								
18	Gauri Jaykumar Bhadikar								
19	Gauri Revtal Risen								
20	Gunjan Uladhar Rokde								
21	Hasya Chandrashekhar Bawankar								
22	Ishika Mahesh Titarmare								
23	Jyoti Lokeshwar Patle								
24	Kalyani Dnyaneshwar Kosulkar								
25	Khushbu Vinod Gaidhane								
26	Khushi Shivlal Parihar								
27	Kshitija Naresh Nipane								
28	Minal Nokram Gahane								
29	Palak Prakash Sakharkar								
30	Abhishek Ajay Ambulkar								
31	Ajinkya Digambar Tiwarangkar								
	Shruti P. Udge	4	3	4	4	4	19	2	

Fig1-Glimpses of question paper

Conclusion

1. **Increased Engagement:** Games inherently engage and motivate students to actively participate in learning. The elements of competition, challenge, and reward encourage students to remain focused and invested in their studies.
2. **Active Learning**: Games often necessitate problem-solving, critical thinking, and decision-making, promoting interactive learning where students engage with content actively rather than passively.
3. **Enhanced Retention**: Due to their memorable and immersive nature, games help students retain information effectively. The interactive features of games reinforce learning through repetition and practice.
4. **Immediate Feedback:** Many educational games offer instant feedback, enabling students to learn from their mistakes in real-time. This feedback loop aids in comprehension and performance improvement.
5. **Differentiated Learning:** Educational games can adapt to various learning styles and paces, providing personalized experiences that cater to diverse student needs.
6. **Increased Attention Span**: Games often require sustained attention, which can improve students' ability to focus and concentrate on tasks over extended periods.
7. **Assessment and Progress Tracking:** Games can assess students' progress and performance, offering educators valuable data to adjust their instructional approaches effectively.

PO	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12
Assessment	✓	✓		✓				✓				✓

Table1-Po Mapped with Activity

3) Learning Through Story Board Teaching (Poster Presentation)

Aim:
Support planning or designing processes using storyboard teaching methods.

Objective:
• Sequence drawings explaining goals and scenes.
• Include images with descriptive paragraphs.

Methodology:
• Storyboard lists important events.
• Captions aligned with storyline.
• Characters clearly identified.
• Storyboard must be easy to read.
• Should include creative details.

SR. NO.	Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Poor (1)
1	Picture/Graphics	Clear and relevant	Mostly clear	Few clear	Not clear or relevant
2	Required Elements	All elements well visible and organized	Most elements good	Few elements visible; missing items	Most elements missing
3	Visual Clarity	Excellent design, neat, easy	Good design and neat	Needs improvement	Poor design
4	Content/Grammar	Excellent grammar, spelling, original	1–2 errors	3–5 errors	6–7 errors
5	Use of Time	Time used productively	Mostly productive	Somewhat productive	Not productive

Effectiveness (BT Level)

• Students present concepts structurally.
• Present to coordinator and classmates.
• Evaluate their own ideas.

Conclusion:
• Helps communicate through visual storytelling.
• Enhances content organization.

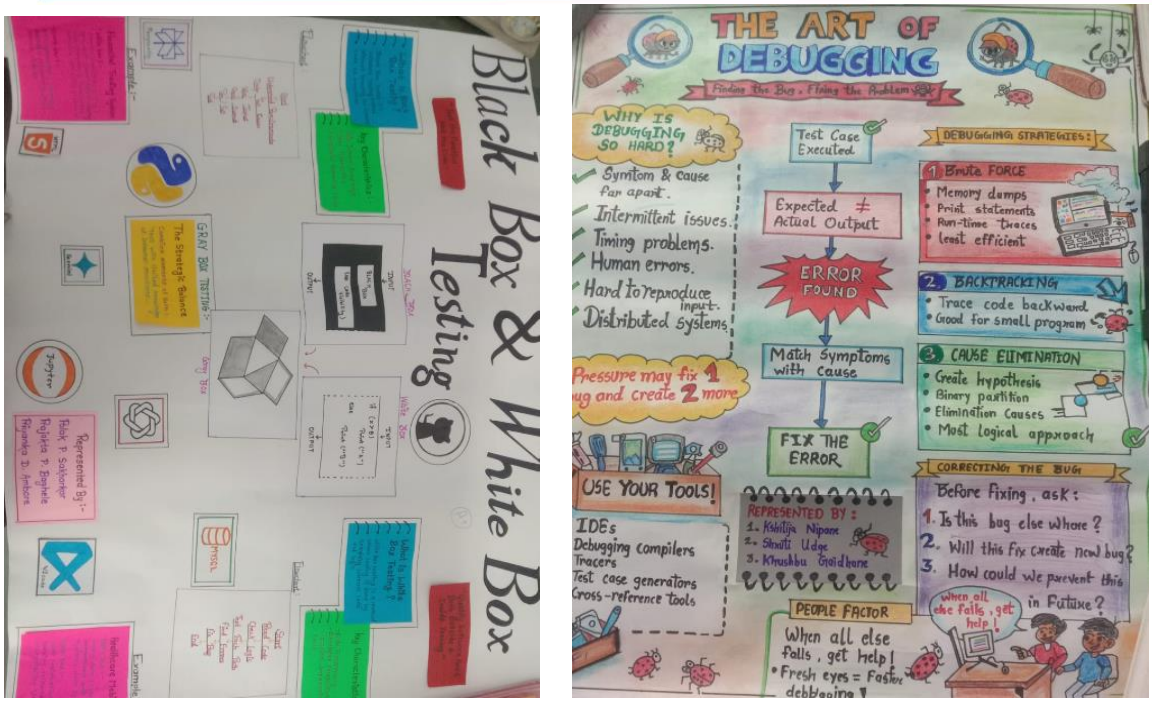

Fig. Poster Presentation

PO	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12
Assessment	✓	✓		✓				✓	✓	✓		✓

4) Flipping Classrooms: Assessment Conducted on 14/02/2026

Flipped classroom is an innovative teaching approach used in SEPM where traditional learning is reversed. Instead of learning concepts during classroom lectures, students first study materials such as videos, notes, or presentations at home. Classroom time is then utilized for discussions, problem-solving, case studies, and project-based activities related to software engineering concepts like SDLC, project planning, risk management, and quality assurance. This method enhances student engagement, promotes active learning, and helps in better understanding and practical application of SEPM concepts. The activity conducted on 14/02/2026.

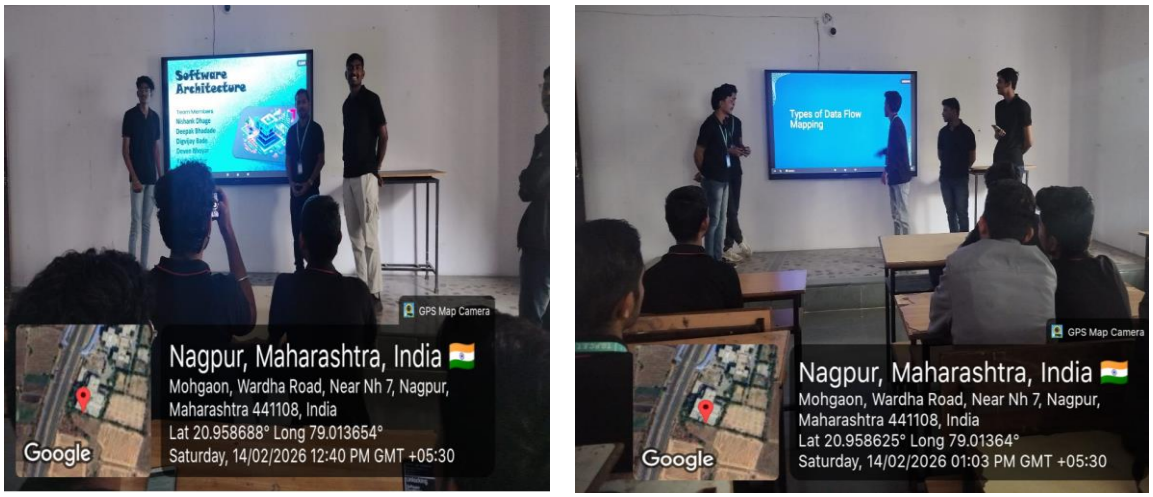

Image: Flipping Classroom

SUBJECT: ENVIRONMENTAL SCIENCE AND SUSTAINABILITY

FOURTH SEMESTER

Introduction

Environmental SCIENCE and Sustainability (ESS) focuses on understanding the relationship between humans and the environment. It covers topics like natural resources, ecosystems, biodiversity, pollution, and sustainable development. The subject aims to create awareness about environmental issues and promote responsible use of resources to protect the environment for future generations.

CONTEXT

In today's world, **Environmental Studies and Sustainability (ESS)** is essential for addressing environmental challenges like pollution, climate change, and resource depletion. It helps individuals understand the importance of conserving natural resources and adopting sustainable practices. ESS is widely applied in daily life, industries, and policy-making to ensure environmental protection and long-term ecological balance.

Course Outcomes

	Course Outcomes
CO1	Understand the basis of solid waste and its management processes.
CO2	Examine the environmental issues of regional and global level.
CO3	Illustrate the different environmental policies to control pollution.

Innovative Teaching Learning

5. Case Study on ESS.

Aim: Analyze real-world scenarios to develop problem-solving and decision-making skills.

Objective:
Apply theoretical knowledge to practical situations and evaluate possible solutions.

Methodology:
Students review the case, identify issues, analyze data, and propose justified solutions.

SR. NO.	Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Poor (1)
1	Problem Identification	Clearly identifies all key issues with strong understanding of the case.	Identifies most issues with minor gaps.	Identifies some issues but lacks clarity.	Fails to identify core problems.

Effectiveness (BT Level)

Enhances critical thinking, analytical ability, and real-life application of concepts.

Conclusion:
Case study assessment bridges theory and practice, improving professional competence.

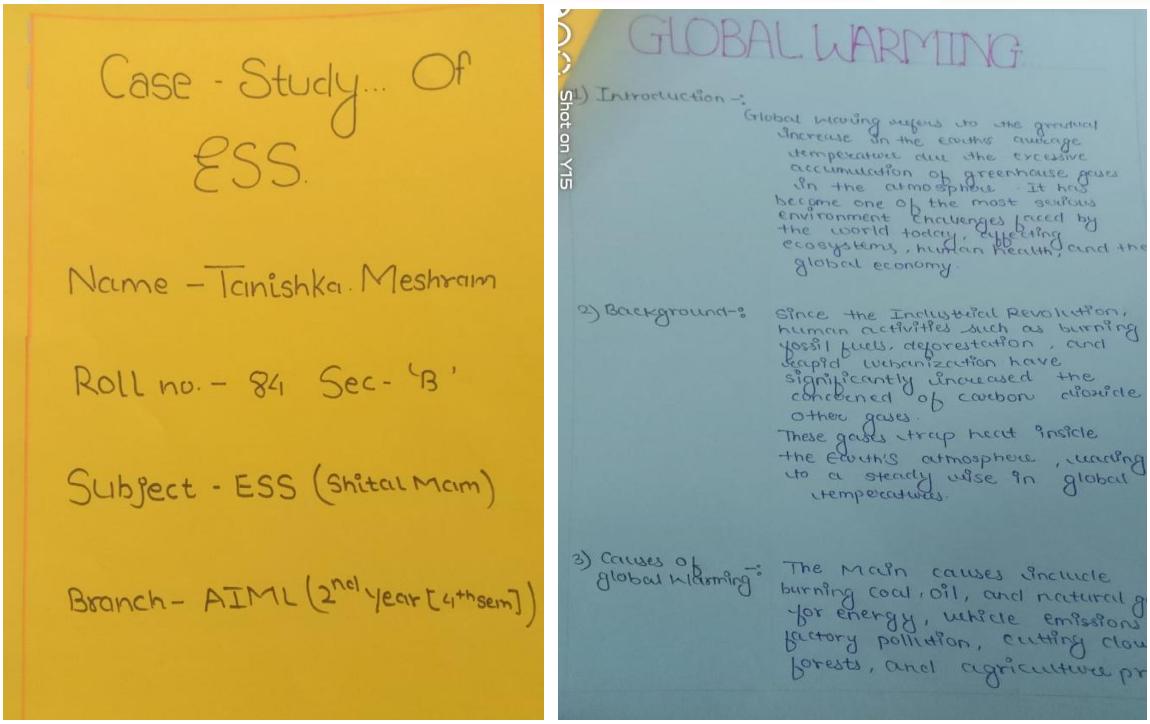

Fig. Case Study

PO	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12
Assessment	✓	✓		✓				✓				✓

6 Flipping Classrooms: Assessment Conducted on 12/03/2026

Aim:
Increase student engagement and learning by selecting topics taught in class and presenting them concept-wise with industrial or real-life applications.

Objective:

- To brainstorm and explore ideas about concepts and problems.
- To provide a better understanding of connections between ideas and concepts.

Methodology:

- Select topics with industrial or real-life applications based on class teaching.
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Parameter Table

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4	Q&A Session	Accurate answers for every question	Answers all but not accurately	Answers more than one but not exact	Answers only one

Effectiveness (BT Level)

- • Students gather information through class teaching and reading.
  • Students present the topic to the coordinator and classmates.
  • Students structure content in an organized manner.
  • Students debate during Q&A.

Conclusion:

• Easier communication of thought processes.
• Better organization of ideas and concepts.
• Improved confidence and learning interest.

Image: Flipping Classroom

PO	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12
Assessment	✓	✓		✓	✓			✓	✓	✓		✓

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Department of Artificial Intelligence & Machine Learning

Session : 2025-26

Subject : Sampling methods and Estimation Theory
Course Code BSH32402
MCQ based Activity On unit II Sampling Theory
Name of student:
Roll no.
Section:

Q.1) What do we say to all units aggregate that's about a study?
A) sample
B) unit
C) universe or population
D) frame
Answer: C

Q.2) What do we call the population value?
A) statistic
B) parameter
C) data
D) variable
Answer: B

Q.3) Out of these, which is not a probability sampling?
A) cluster sampling
B) stratified sampling
C) quota sampling
D) simple random sampling
Answer: C

Q.4) We call judgmental sampling?
A) extensive sampling
B) convenience sampling
C) cluster sampling
D) purposive sampling
Answer: D

Q.5) Out of the mentioned options, which is not a non-probability sampling?
A) judgmental sampling
B) cluster sampling

C) extensive sampling
D) convenience sampling
Answer: B

Q.6) Out of these strata, which of the sample population is separated into various strata, and the sample of one is taken from some other strata?
A) snowball sampling
B) census sampling
C) quota sampling
D) stratified sampling
Answer: D

Q.7) A survey was done among the friends, class, and neighbors to know their preference for a particular brand of cold drink. This is an example of _____.
A) judgment sampling
B) cluster sampling
C) convenience sampling
D) stratified sampling
Answer: C

Q.8) Out of the mentioned, which is not a type of non-probability sampling?
A) quota
B) stratified random sampling
C) none of the above-mentioned options
D) all of these mentioned options
Answer: B

Q.9) A Sampling of Size 36 is drawn from a population consisting of 196 units. If the population standard deviation is 7, find the standard error of the sample mean when the sample is drawn without replacement.
A) 2.5
B) 1.0568
C) 1.1667
D) 2.3
Answer: B

Q.10) A Sampling of Size 36 is drawn from a population consisting of 196 units. If the population standard deviation is 7, find the standard error of the sample mean when the sample is drawn with replacement.

A) 2.5
B) 5.5
C) 1.1667
D) 1.0568
Answer: C

Q.11) The number of possible outcomes for without replacement:
A) N^n
B) N = n
C) NCn
D) N + n
Answer: C

Q.12) The number of possible outcomes for with replacement:
A) N + 1
B) N^n
C) N − 1
D) NCn
Answer: B

Sample Evaluation Sheet

PO	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12
Assessment	✓	✓		✓				✓				✓

Table-Po Mapped with Activity