GANDHI INSTITUTE OF ENGINEERING & TECHNOLOGY UNIVERSITY,
GUNUPUR – 765022

B. Tech (Third Semester)

CYCLE TEST – II

Applied Statistics [AIML/DS]

Time: 75 Minutes | Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ALL questions	CO #	Blooms Level
a. What is Null Hypothesis?	4	1
b. Write the "z" value for 95% and 99% levels of confidence in a left-tailed test.	5	2
c. Write down a short note about Statistical Inference.	3	1
d. Write down the standard error formula for the difference of two independent standard deviation.	3	1
e. Show that the efficiency of any estimator cannot exceed unity.	4	2

PART – B **(10 x 2 = 20 Marks)**

Answer ALL Questions

2.a. Calculate Spearman's Rank Correlation.

X_i	39	65	62	90	82	75	25	98	36	78
Y_i	47	53	58	86	62	68	60	91	51	89

Marks: 5 | CO#: 2 | Blooms Level: 2

b. Calculate Line of Regression Equation

Sales (X_i)	91	97	108	121	67	124	51	73	111	57
Purchases (Y_i)	71	75	69	97	70	91	39	61	80	47

Marks: 5 | CO#: 2 | Blooms Level: 3

(OR)

c. A random sample of 144 observations yields sample mean $\bar{x} = 250$ and sample variance $S^2 = 576$. Compute 95% and 99% confidence interval for the population mean. Marks: 5 | CO#: 3 | Blooms Level: 3

d. Let $X_1, X_2, X_3, \ldots . X_n$ be a random sample from Normal distribution $N(\mu, \sigma^2)$ population. Prove that $t = \frac{\sum_{i=1}^{n} X_i}{n}$ is a good estimator of μ. Marks: 5 | CO#: 3 | Blooms Level: 2

P.T.O

3.a. In a random sample of 400 persons from a large population, 120 are females. Can it be said that males and females are in ratio 5:3 in the population? Use 1 % level of significance. 5 4 3

b. A company has head office at Kolkata and a branch at Mumbai. The personal director wants to know if the workers at the two places would like the introduction of a new plan work and a survey has conducted for this purpose. Out of sample of 500 workers at Kolkata 62% favor the new plan. At Mumbai out of 400 workers 41% were against the new plan. Is there any significance difference b/w the two groups in their attitude towards the new plan at 5% level? 5 5 3

(OR)

c. In order to make a survey of the buying habits, 2 makers A & B are chosen at 2 different parts of city. 400 women shoppers are chosen are random in market A. Their average daily expenditure on food is found to be Rs.250 with standard deviation Rs.40. The figure are Rs.220 and Rs.55 in the market B, where also 400 female shoppers are chosen at random. Test at 1% liberal of significance weather the daily food expenditure of the two population of shoppers are equal. 5 5 3

d. The mean yield of 2 sets of plots and their variability are as given below. Examine whether the difference in the variability in the yields in significance at 5% level of significance. 5 5 3

	Set of 40 plots	Set of 60 plots
Mean Yield per plot	1258 lb	1243 lb
S.D per plot	34	28

S70

GANDHI INSTITUTE OF ENGINEERING & TECHNOLOGY UNIVERSITY,
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B. Tech [CSE/AIML/DS] (Third Semester)

CYCLE TEST – II

Intermediate Communication Skills and Critical Thinking

Time: 75 Minutes | Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ALL questions	CO #	Blooms Level
a. Define the concept of Free Writing.	4	K1
b. Briefly discuss the following terms: i) Intensive Reading ii) Extensive Reading	5	K1
c. Outline the concept of Reading comprehension.	5	K2
d. Lucubrate Lateral Thinking.	6	K2
e. Explain the skill of Inference as part of critical thinking.	6	K2

PART – B **(10 x 2 = 20 Marks)**

Answer ALL Questions	Marks	CO#	Blooms Level
2.a. Describe the key etiquettes essential for professional writing.	5	4	K1
b. Analyze the importance of writing in professional growth.	5	4	K4
(OR)			
c. Explain each stage involved in the writing process.	5	4	K2
d. Classify the types of reading based on purpose.	5	5	K2
3.a. Discuss the strategies for developing effective reading skills.	5	5	K1
b. Analyze the role of Intensive Reading in enhancing the grasp of knowledge.	5	5	K4
(OR)			
c. Justify the need for Critical Thinking in the personal and academic growth of students.	5	6	K2
d. Differentiate between Lateral Thinking and Critical Thinking by highlighting their unique features.	5	6	K2

GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR
B. TECH III SEMESTER 2025-26 CYCLE TEST - II
DIGITAL ELECTRONICS
CSE / CSE (AIML) / CSE (DS)

Time: 75 Minutes **Maximum: 30 Marks**

(The figures in the right hand margin indicate marks.)

PART - A **(2 × 5 = 10 Marks)**

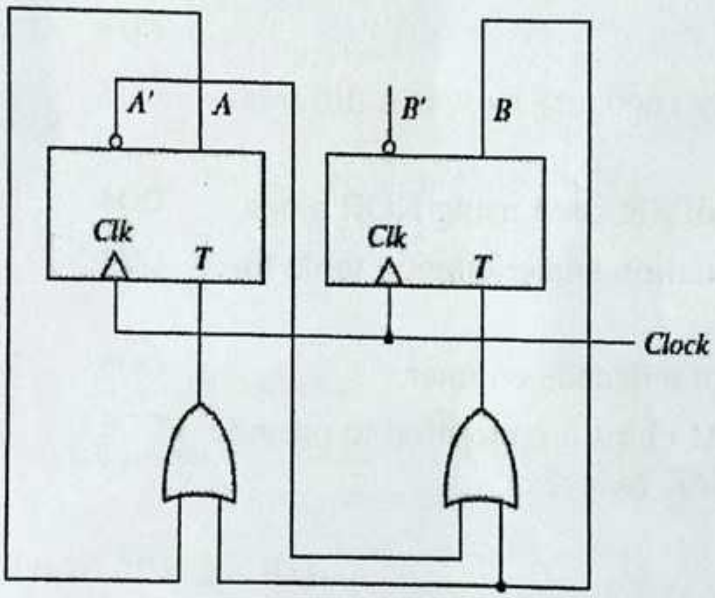
1. Answer ALL questions.		**CO #**	**BTL**
a.	What is meant by priority encoder? How is it different from an encoder?	CO3	2
b.	Draw the logic diagram of SR latch using NOR gates.	CO4	3
c.	Write a characteristic equation and excitation table for the D flip-flop.	CO4	2
d.	Draw the state diagram of a decade counter.	CO5	3
e.	How many 16K × 4 RAM chips are required to provide a memory capacity of 256K bytes?	CO6	3

PART - B **(10 × 2 = 20 Marks)**

Answer ALL Questions.		**Marks**	**CO#**	**BTL**
2.a.	Simplify the following function using a 4-variable K-map and draw the simplified logic circuit using the universal gate. $F(A,B,C,D) = \sum m(1,3,4,5,8,10,11,15) + \sum d(0,2,7,14)$	6	CO2	4
b.	Implement the Boolean function $F(x,y,z) = \sum(1,2,6,7)$ with a multiplexer.	4	CO3	3
	(OR)			
c.	What is a full adder circuit? Draw its truth table. Design a full adder circuit using two half adder circuits and an 'OR' gate.	6	CO3	3

P.T.O

d.	Construct a 4-to-16-line decoder with two 3-to-8-line decoders with enable.	4	CO3	4
3.a.	Derive the state table and the state diagram of the sequential circuit shown in the figure.	6	CO4	4



b.	Design a combinational circuit using a ROM that accepts 3-input and produces its 1's complement as output.	4	CO6	4
	(OR)			
c.	Design a 3-bit synchronous binary counter.	6	CO5	4
d.	What is a shift register? Explain the principle of a 4-bit serial-in, serial-out, shift register.	4	CO5	2

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Gandhi Institute of Engineering & Technology University,
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B. Tech [CSE-AIML] (Third Semester)

CYCLE TEST – II

Artificial Intelligence & Expert Systems

Time: 75 Minutes Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ALL questions	CO #	Blooms Level
a. Discuss the types of games in AI	CO3	K1
b. Explain the two components of NLP	CO4	K2
c. Discuss understanding? What makes understanding hard?	CO3	K1
d. Explain the various types of spelling errors	CO4	K2
e. Describe rote learning with examples	CO5	K1

PART – B **(10 x 2 = 20 Marks)**

Answer ALL Questions	Marks	CO#	Blooms Level
2.a. Explain Minimax Algorithm and apply it for the terminal values with proper step descriptions -2, 5, 4, 3, -2, -6, 1, 8	5	CO3	K3
b. Discuss the various elements of games in AI.	5	CO4	K1
(OR)			
c. Explain the various types of planning with example	5	CO4	K3
d. Describe the different types of parsing techniques with examples	5	CO3	K1
3.a. Explain Alpha- Beta Pruning Algorithm and apply it for the terminal values with proper step descriptions 3, 5, 4, -2, -4, -6, 0, 7	5	CO4	K3
b. Describe the 5 various stages of NLP	5	CO5	K2
(OR)			
c. Explain neural network learning with diagram	5	CO3	K2
d. Discuss the 5 different learnings through examples	5	CO4	K1

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B. Tech[CSE/AIML/DS] (Third Semester)

CYCLE TEST – II

Database Management System

Time: 75 Minutes | Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

PART – A **(2 x 5 = 10 Marks)**

	Q.1. Answer ALL questions	CO #	Blooms Level
a.	What is Functional Dependency?		1
b.	Explain Concurrency control?		2
c.	What are the states of a transaction?		2
d.	Define commit and rollback.		3
e.	What is called mirroring?		1

PART – B **(10 x 2 = 20 Marks)**

	Answer ALL Questions	Marks	CO #	Blooms Level
2.a.	Consider a students relation having attributes: Studid, Name, City, Phone, Branch, percentage. Write down relational algebra for the below queries: Query 1: Find the details from relation students where branch is ece. Query 2:Find the details where branch is ece and belongs to bbsr Query 3: Find the details who are not belongs to bbsr.	5	2	3
b.	What are the ACID properties? Explain the different states of a transaction?	5	1	1
	(OR)			
c.	Given Relations: • Emp(empid, name, age, salary) • Projects(pno, pname, location) • WorksOn(empid, pno, hours) Write down the query using relational algebra: Query 1: Find all the employee ids of employee table who works on all the projects where the Employee "SAMMY" works on.	5	2	4

P.T.O

d.	What is recovery in DBMS? Explain log-based recovery techniques.	5	2	3
3.a.	Briefly explain the importance of 1NF, 2NF and 3NF with a suitable example.	5	2	3
b.	Explain lock-based concurrency control. Differentiate between shared and exclusive locks.	5	2	3
	(OR)			
c.	What is a deadlock? List methods to handle deadlocks.	5	2	3
d.	Briefly explain BCNF, 4NF and 5NF using a suitable example.	5	1	1

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B. Tech[CSE/AIML/DS] (Third Semester)

CYCLE TEST – II

Object Oriented Programming Using Java

Time: 75 Minutes | Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ALL questions	CO #	Blooms Level
a. Explain the structure of a Java source file with suitable examples.	CO1	K2
b. Justify and explain whether the following sequence is correct or not: try { } System.out.println("Sai"); finally { }	CO4	K4
c. Predict the output of the following code: Boolean b1=new Boolean("SAI"); System.out.println(b1);	CO1	K2
d. Explain the difference between StringBuffer, and StringBuilder classes.	CO3	K2
e. Describe the functionality of replace(), and split(), methods in Java String class.	CO3	K2

PART – B **(10 x 2 = 20 Marks)**

Answer ALL Questions	Marks	CO#	Blooms Level
2.a. Design an interface named AccountOperations containing methods deposit() and withdraw(). Implement this interface in a class SavingsAccount and demonstrate how the operations work.	5	CO3	K3
b. Write a Java program to illustrate how autoboxing and unboxing work with the char data type.	5	CO3	K3
(OR)			
c. Implement a Java program that defines a custom exception named UnderAgeException which is thrown when the entered age is < 18.	5	CO4	K4

P.T.O

d.	Implement a Java program that uses String class to extract words from a sentence and display each word and the total number of words.	5	CO5	K3
3.a.	Implement a Java program that creates two child threads (T1 and T2). Thread T1: Print the even numbers from 1 to 50. Thread T2:Print the odd numbers from 100 to 200.	5	CO3	K3
b.	Illustrate the significance of the "anonymous inner class". Explain with an example.	5	CO3	K3
	(OR)			
c.	Explain how Java achieves multithreading using both Thread class and Runnable interface. Which approach is preferable and why?	5	CO1	K2
d.	Write a Java program to copy the contents of one file to another file. Explain how exceptions are handled.	5	CO5	K3