



ARKA JAIN
University
Jharkhand



[18-11-2025]

END SEM EXAMINATION
School of Engineering & IT

Program	Computer Science & Engineering	Branch	B. Tech
Subject Name	Biology for Engineers	Session	Odd, 2025-26
Semester	VII	Year	Nov, 2025 *
Time: 3 Hour Max. Marks : 70	<ul style="list-style-type: none"> Start writing from 2nd page onwards; don't Write on the 1st Page Backside Answer all Questions of Section A (Compulsory) Answer Any Four out of Six of Section B Answer Any Three out of Five of Section C Possession of Mobile Phone or any kind of Written Material, Arguments with the Invigilator or Discussion with Co-Student will come under <u>Unfair Means</u> and will <u>Result in the Cancellation of the Paper(s)</u>. 		
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Section A (Each question Carry 02 Marks from Q1-i to x - 20 Marks)

Q.N	QUESTIONS	Marks	COs	KL
1				
i	What are autotrophs & heterotrophs?	2	CO3	K1
ii	Draw ultra-structure of Prokaryotic cell.	2	CO3	K3
iii	What is gene mapping?	2	CO5	K5
iv	Write any four functions of proteins?	2	CO4	K1
v	How many types of nucleic acids are there? And write any two functions.	2	CO4	K3
vi	Write full form of M-RNA & TRNA & their functions?	2	CO5	K1
vii	What are the two Purines & Pyrimidines of DNA?	2	CO5	K1
viii	Define photosynthesis with the help of chemical reaction.	2	CO3	K2
ix	Define Buffer solution.	2	CO2	K3
x	Write the principle of fluorescence spectroscopy.	2	CO2	K4

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 05 Marks)

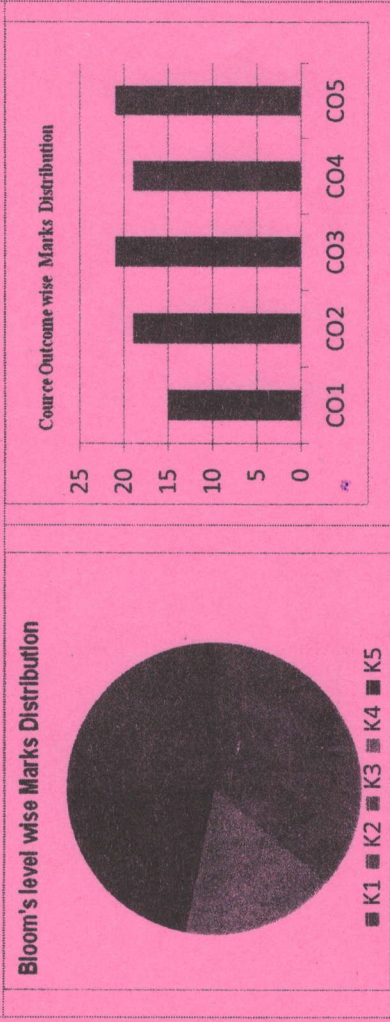
Q. No.	QUESTIONS	Marks	COs	KL
2	What are Model organisms? Give brief notes any three model organisms.	05	CO2	K5
3	What is Mitotic Cell division? Explain Mitosis with neat diagram.	05	CO5	K4
4	Distinguish between the Scientific Enquiry and Engineering Method of research.	05	CO1	K3
5	Differentiate between Unicellular and Multicellular organisms.	05	CO3	K5
6	Discuss about the enzymes and its role in plants?	05	CO4	K3
7	Give brief account on hierarchy of DNA structure from single stand to double helix?	05	CO5	K2

Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Define classification. Give an account on three Kingdom classifications.	10	CO3	K3
9	Define gene Interaction. Give brief account on Dominant Epistasis with suitable example.	10	CO5	K5
10	Define Biosensor. What are the components of biosensor? Explain the working principle of biosensor.	10	CO1	K4
11	Write a note on sterilization and various techniques used.	10	CO2	K3
12	What are carbohydrates? Classify and explain monosaccharaides.	10	CO4	K2

Course Outcomes	CO1	CO2	CO3	CO4	CO5
Understand the biological concepts from an engineering perspective					
Understand the concepts of biological sensing and its challenges					
Understand development of artificial systems mimicking human action					
Integrate biological principles for developing next generation technologies.					
To provide an insight into latest (R&D oriented) topics, to enable the engineering student upgrade the existing technologies and pursue further research.					

GRAPHICAL REPRESENTATION





**ARKA JAIN
University**
Jharkhand



[25-11-2025]

END SEM EXAMINATION
School of Engineering & IT

Program	Computer Science & Engineering	Branch	B. Tech
Subject Name	Data Mining and Warehousing	Session	Odd, 2025-26
Semester	VII	Year	Nov, 2025 *
Time: 3 Hour Max. Marks : 70	<ul style="list-style-type: none"> Start writing from 2nd page onwards; don't write on the 1st Page Backside Answer all Questions of Section A (Compulsory) Answer Any Four out of Six of Section B Answer Any Three out of Five of Section C Possession of Mobile Phone or any kind of Written Material, Arguments with the Invigilator or Discussion with Co-Student will come under Unfair Means and will Result in the Cancellation of the Paper(s). 		
Knowledge Level (KL)	K1 : Remembering K2 : Understanding	K3 : Applying K4 : Analysing	K5 : Evaluating K6 : Creating

Section A (Each question Carry 02 Marks from Q1-i to x - 20 Marks)

Q.N	QUESTIONS	Marks	COs	KL
1				
i	Define Data discretization and Data transformation.	2	CO1	K1
ii	Define data visualization.	2	CO1	K2
iii	What is a data cube?	2	CO2	K1
iv	Describe dicing in Data warehouse.	2	CO2	K2
v	Mention any two differences between OLAP and OLTP.	2	CO3	K2
vi	What is outlier analysis?	2	CO3	K2
vii	Define constraint-based association mining.	2	CO4	K2
viii	Define frequent item set.	2	CO4	K1
ix	List the major clustering methods.	2	CO5	K1
x	Differentiate between hard clustering and soft clustering.	2	CO5	K2

Section B (Answer any FOUR out of SIX) - 20 Marks
(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Differentiate between data integration and data cleaning.	05	CO1	K2
3	Describe the architecture of data warehouse.	05	CO2	K2
4	Explain the process of computing data cubes with an example.	05	CO3	K3
5	Explain the Apriori algorithm for mining frequent item sets.	05	CO4	K3
6	Discuss the challenges in clustering high-dimensional data.	05	CO5	K4
7	Illustrate the steps of k-means clustering with a small dataset.	05	CO5	K3

Section C (Answer any THREE out of FIVE) - 30 Marks
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Explain how data reduction is performed and how do you handle missing values while cleaning the data.	10	CO1	K4
9	Analyse the challenges in data warehousing, especially in terms of combining heterogeneous data sources.	10	CO2	K3
10	Using an example explain how OLAP Data Modeling is done for retail sales data set. Discuss the different types of OLAP servers.	10	CO3	K4
11	Find the frequent itemsets and generate association rules on the given data set using Apriori Algorithm. Assume that minimum support threshold ($s = 33.33\%$) and minimum confident threshold ($c = 60\%$)	10	CO4	K5
12	Explain density-based methods (DBSCAN) in detail with an example.	10	CO5	K3

Transaction ID	Items
T1	Hot Dogs, Buns, Ketchup
T2	Hot Dogs, Buns
T3	Hot Dogs, Coke, Chips
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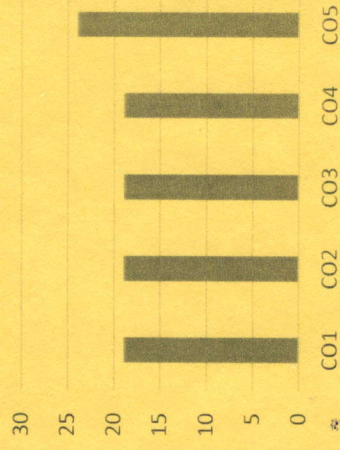
Course Outcomes	CO1	CO2	CO3	CO4	CO5
	Understand Data Warehouse fundamentals, Data Mining Principles	Design data warehouse with dimensional modelling and apply OLAP operations.	Identify appropriate data mining algorithms to solve real world problems.	Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining.	Describe complex data types with respect to spatial and web mining.

GRAPHICAL REPRESENTATION

Bloom's Level Wise Marks Distribution



Course Outcome Wise Marks Distribution





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[25-11-2025]

END SEM EXAMINATION
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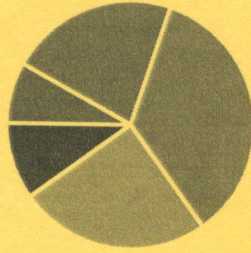
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12	Explain density-based methods (DBSCAN) in detail with an example.	10	CO5	K3														

CO- Course Outcomes, **KL-** Knowledge Level, **PO** – Program Outcome

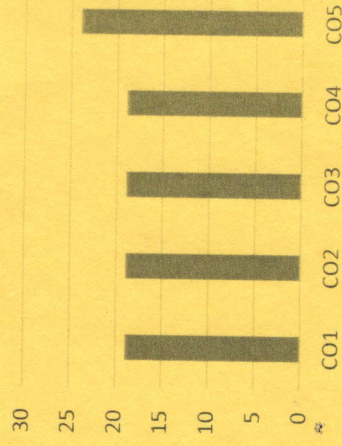
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GRAPHICAL REPRESENTATION

Bloom's Level Wise Marks Distribution



Course Outcome Wise Marks Distribution



	ARKA JAIN University Jharkhand		[22-11-2025] END SEM EXAMINATION School of Engineering & IT
Program	Computer Science Engineering		Branch B. Tech
Subject Name	Real Time Systems		Session Odd, 2025-26
Semester	VII	Year	Nov, 2025
Time: 3 Hour Max. Marks : 70	<ul style="list-style-type: none"> Start writing from 2nd page onwards; don't Write on the 1st Page Backside Answer all Questions of Section A (Compulsory) Answer Any Four out of Six of Section B Answer Any Three out of Five of Section C Possession of <u>Mobile Phone</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussion with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result in the Cancellation of the Paper(s).</u> 		
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Section A (Each question Carry 02 Marks from Q1-i to x - 20 Marks)

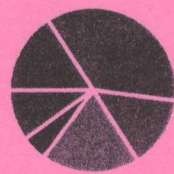
Q. N	QUESTIONS	Marks	COs	KL
i	Mention one of the shortcomings of EDF scheduling	02	CO3	K4
ii	Write the conditions required to select a frame size for a task to be cyclic schedulable.	02	CO3	K1
iii	Emphasize on safety and reliability in Real time system	02	CO2	K2
iv	Briefly describe the Soft real time systems	02	CO1	K2
v	Write the sufficient condition for a periodic task to be RMA schedulable.	02	CO3	K3
vi	Analyze whether the statement "All hard real time systems are safety-critical in nature" is true in its sense or not.	02	CO2	K4
vii	Write the necessary condition for a periodic task to be RMA schedulable	02	CO3	K1
viii	Analyze and explain under what condition Liu and Layland's test is necessary in RMA scheduling	02	CO3	K3
ix	Task completion time for a foreground-background task is calculated by what formula?	02	CO3	K1
x	Explain timing constraint in real time system	02	CO2	K2

Section B (Answer any FOUR out of SIX) – 20 Marks (Each question Carry 05 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
2	A preemptive static priority real-time task scheduler is used to schedule two periodic tasks T1 and T2 with the following characteristics: $T_1 = (e_1=10, p_1=20)$, $T_2 = (e_1=20, p_1=50)$ assume that T1 has higher priority than T2. A background task arrives at time 0 and would require 1000 msec to complete. Compute the completion time of background task assuming that context switching takes no more than 0.5 msec	05	CO2	K5
3	Mention some of the advantages and disadvantages of RMA.	05	CO1	K1
4	With example briefly explain Firm Real time system	05	CO1	K6
5	With a neat sketch, create sporadic task model of real time systems	05	CO1	K6
6	Explain Quality of Service (QoS) in Real time communication	05	CO4	K4
7	Explain One shot Timers. Why watchdog timers are popular example of one shot timers.	05	CO2	K1
Section C (Answer any THREE out of FIVE) – 30 Marks (Each question Carry 10 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
8	A Cyclic scheduler is to be used to run the following set of periodic tasks on a uniprocessor: $T_1 = (e_1=1, p_1=4)$, $T_2 = (e_1=1, p_1=5)$, $T_3 = (e_1=1, p_1=20)$ and $T_4 = (e_1=2, p_1=20)$. Select an appropriate frame size.	10	CO3	K3
9	Describe the basic features of the relational data model. Discuss their advantages, disadvantages and importance of the end-user and the designer	10	CO4	K4
10	Describe in detail the different types of DBMS.	10	CO3	K2
11	Discuss the concept of data independence and explain its importance in a database environment	10	CO4	K2
12	Explain Transaction processing in real time systems, Lay emphasis on priority	10	CO2	K2

CO1	Understand the use of multi-tasking techniques in real time systems.
CO2	Evaluate the performance of soft and hard real time systems.
CO3	Analyze multi task scheduling algorithms for periodic, aperiodic and sporadic tasks.
CO4	Understand the use of real-time databases in real time systems

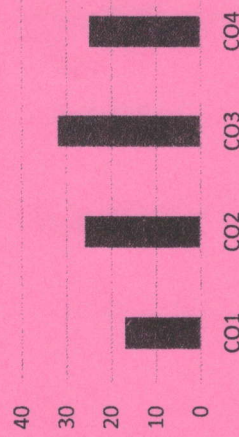
GRAPHICAL REPRESENTATION

Bloom's Level Wise Marks Distribution



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome Wise Marks Distribution





ARKA JAIN
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Jharkhand



[20-11-2025]

END SEM EXAMINATION
School of Engineering & IT

Program	Computer Science & Engineering		Branch	B. Tech
Subject Name	Cryptography and Network Security		Session	Odd, 2025-26
Semester	VII		Year	Nov, 2025 *
Time: 3 Hour Max. Marks : 70	<ul style="list-style-type: none"> Start writing from 2nd page onwards; don't Write on the 1st Page Backside Answer all Questions of Section A (Compulsory) Answer Any Four out of Six of Section B Answer Any Three out of Five of Section C Possession of Mobile Phone or any kind of Written Material, Arguments with the Invigilator or Discussion with Co-Student will come under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Paper(s)</u>. 			
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Section A (Each question Carry 02 Marks from Q1-i to x - 20 Marks)

Q. N	QUESTIONS	Marks	COs	KL
1				
i	Specify the four categories of security threats.	2	CO1	K2
ii	Define cryptanalysis?	2	CO3	K1
iii	Explain, Why network needs security?	2	CO3	K2
iv	Compare Substitution and Transposition techniques	2	CO4	K1
v	Define Diffusion & Confusion.	2	CO2	K1
vi	What you mean by MAC?	2	CO2	K1
vii	Specify the basic task for defining a security service.	2	CO1	K2
viii	Define S/MIME?	2	CO3	K1
ix	Identify an example for substitution and transposition ciphers.	2	CO2	K4
x	What are the requirements of the hash function?	2	CO4	K2

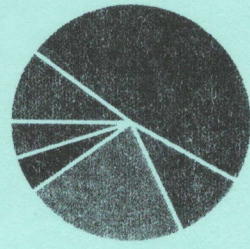
PSection B (Answer any FOUR out of SIX) – 20 Marks (Each question Carry 05 Marks)				
Q No.	QUESTIONS	Marks	COs	KL
2	Distinguish Encryption and Decryption with proper examples and algorithms used.	05	CO2	K4
3	Decipher the following cipher Text using brute force attack: ZHORPH WR DMX and also specify which encryption technique is used.	05	CO2	K5
4	Convert the Given Text "ENGINEERING" into cipher text. Using multiplicative substitution cipher using key K=3.	05	CO2	K6
5	Describe Digital signatures, its benefits and challenges.	05	CO1	K4
6	Explain the services provided by PGP services?	05	CO1	K2
7	Write brief note on Web Security.	05	CO4	K2

Section C (Answer any THREE out of FIVE) – 30 Marks (Each question Carry 10 Marks)				
Q No.	QUESTIONS	Marks	COs	KL
8	Write and explain the Digital Signature Algorithm.	10	CO1	K2
9	Perform encryption using RSA algorithm with $p=3$, $q=11$, $e=7$ and $M=5$.	10	CO2	K3
10	Explain the various measures that may be used for intrusion detection. Briefly explain the design principles of block cipher.	10	CO2	K4
11	What is a Threat? List their types. Compare the Features of SHA-1 and MD5 algorithm.	10	CO3	K2
12	Differentiate spyware and virus. Explain Diffie Hellman key Exchange in detail with an example?	10	CO3	K2

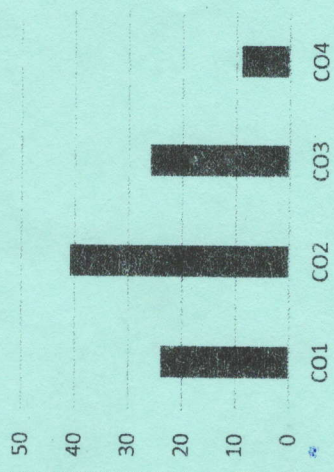
CO1	Acquire professional/academic knowledge and skills
CO2	Describe some common problems or attacks on network security
CO3	Describe some network security services and mechanisms
CO4	Study and analyze some cryptographic algorithms with their relation with real life

GRAPHICAL REPRESENTATION

Bloom's Level wise Marks Distribution



Course Outcome wise Marks Distribution



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6