

ARKA JAIN University
Jharkhand

NAAC GRADE A
ACCREDITED UNIVERSITY

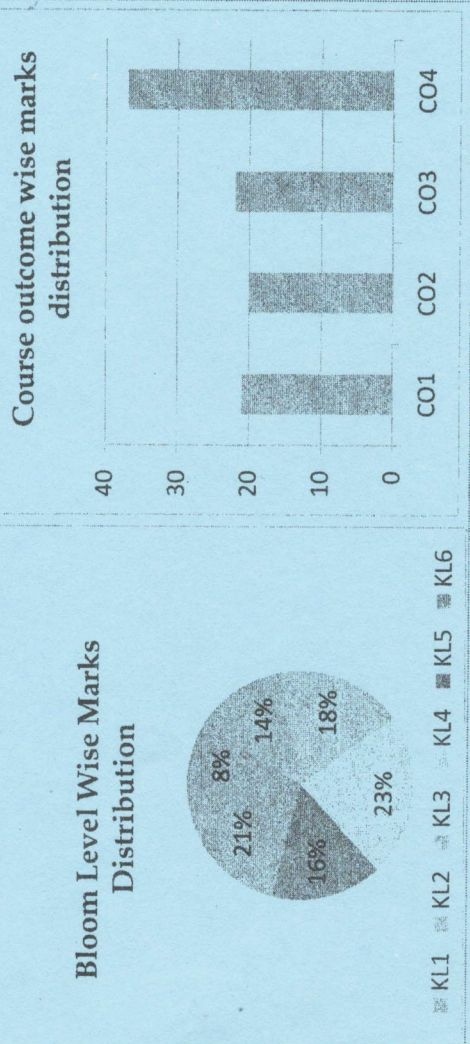
END SEM EXAMINATION
School of Engineering & IT

Program	Bachelor of Computer Application	
Subject Name	Software Engineering	VI
		Semester Year
		April 2024
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 Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will come under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation</u> of the <u>Papers</u>. 	
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 1	QUESTIONS	Marks COs KL
i	What is software Engineering?	2 CO1 K1
ii	What is Software Product?	2 CO2 K4
iii	Define Software Requirement Specification (SRS).	2 CO3 K3
iv	Define Context model.	2 CO4 K1
v	What is the need of deploying a project?	2 CO3 K2
vi	What is the need of feasibility study?	2 CO1 K4
vii	What are the causes of system failure?	2 CO2 K5
viii	Why Data Flow Diagram (DFD) is required?	2 CO4 K1
ix	Name two cost estimation approaches.	2 CO1 K3
x	Define Principal dependability properties.	2 CO4 K2

CO- Course Outcomes,	KL- Knowledge Level,	PO - Program Outcome
CO1	Understand the importance of the stages in the software development life cycle	
CO2	Understand the various process models.	
CO3	Understand the UML notation.	
CO4	Be able to design software by applying the software engineering principles.	

GRAFICAL REPRESENTATION



KL1 KL2 KL3 KL4 KL5 KL6

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 5 Marks)

Q.No.	QUESTIONS	Marks	COs	KL
2	What is the need of software measurement and metrics?	5	CO2	K1
3	Explain the phases of Software development lifecycle.	5	CO3	K3
4	Define critical System and its types.	5	CO4	K5
5	Explain black-box and White-box testing.	5	CO1	K6
6	Explain the system models and its types.	5	CO4	K4
7	Differentiate between program and product.	5	CO2	K2

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

Q.No.	QUESTIONS	Marks	COs	KL
8	With a neat diagram explain two Software development process models with its advantages and disadvantages.	10	CO2	K2
9	Explain the activities involved in software project management?	10	CO3	K3
10	What is verification and validation? Define the activities involved in validation.	10	CO2	K5
11	What is system engineering and components of systems?	10	CO4	K4
12	Suppose a project was estimated to be 400 KLOC. Calculate the effort and development time for each of the three model i.e., organic, semi-detached & embedded.	10	CO1	K6

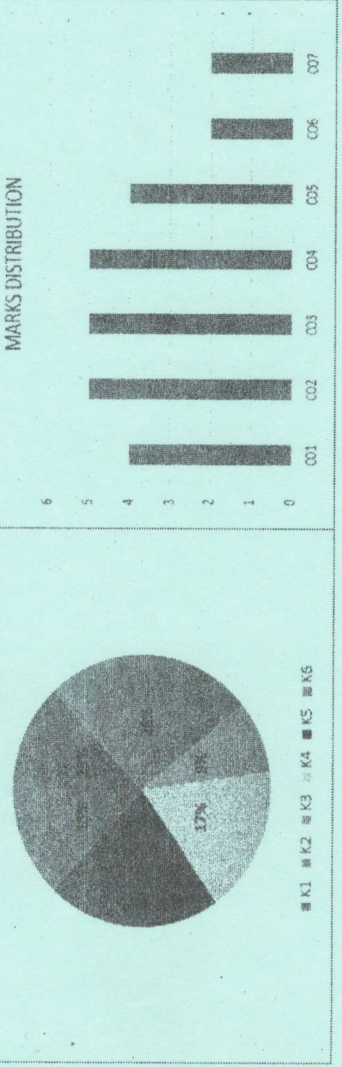
3/5/24 M 170

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

CO1	To understand the basic concepts of time series analysis.
CO2	To understand the elementary time series models and model evaluation techniques.
CO3	To understand the integration process of non-stationary data set.
CO4	To understand the importance of ARMA and ARIMA models for forecasting.
CO5	To understand the basic concepts and estimation procedure for VAR models.
CO6	To understand the method to select the appropriate number of order of variables.
CO7	To understand the ARCH and GARCH models.

GRAFICAL REPRESENTATION

Bloom's Level wise Marks Distribution



Program	Bachelor of Computer Application(DS Specialization)	
Subject Name	Time Series Analysis	
Time: 3 Hour	Semester	VI
Max. Marks: 70	Year	April 2024
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. N1	QUESTIONS	Marks
i	Define Time Series Analysis?	2
ii	Define PACF	2
iii	List out Four Component of Time Series Analysis	2
iv	Write the Formula for Mixed time Series Decomposition?	2
v	What are the different types of exponential smoothing?	2
vi	Define Weak Stationarity?	2
vii	What is Residual?	2
viii	Explain White Noise?	2
ix	Write the Full Form of KPSS?	2
x	Write the Full Form of ADF Test?	2

Section B (Answer any FOUR out of SIX) – 20 Marks (Each question Carry 5 Marks)																																		
Q. No.	QUESTIONS	Marks	COs	KL																														
2	Briefly elaborate Time Series Decomposition? Give the Python Implementation used for Time Series Decomposition?	5	CO4	K2																														
3	Explain the plotting of Partial Autocorrelation and correlation Function using Python?	5	CO4	K4																														
4	Briefly explain the ARCH and the GARCH Model?	5	CO7	K2																														
5	Define Simple Exponential Smoothing? What are the different types of simple exponential smoothing?	5	CO4	K3																														
6	What do you understand by stationarity? Differentiate between Strong and Weak Stationarity?	5	CO5	K5, K6																														
7	Give the Derivation for Autocovariance	5	CO4	K3																														
Section C (Answer any THREE out of FIVE) – 30 Marks- (Each question Carry 10 Marks)																																		
Q. No.	QUESTIONS	Marks	COs	KL																														
8	Write Short note on a. Time Series Decomposition b. VARIMA c. Autocorrelation d. Differencing e. ARIMA Model	10	CO2	K5, K6																														
9	List out the Steps involved in the moving average process? How do we implement MA models using Python?	10	CO6	K2																														
10	Find seasonal variation by the ratio-trend method from the data given below	10	CO7	K1																														
		<table border="1"> <thead> <tr> <th>Year</th> <th>I Quarter</th> <th>II Quarter</th> <th>III Quarter</th> <th>IV Quarter</th> </tr> </thead> <tbody> <tr> <td>1990</td> <td>27.5</td> <td>30.5</td> <td>33.5</td> <td>36.5</td> </tr> <tr> <td>1991</td> <td>39.5</td> <td>42.9</td> <td>45.5</td> <td>48.5</td> </tr> <tr> <td>1992</td> <td>51.5</td> <td>54.5</td> <td>57.5</td> <td>60.5</td> </tr> <tr> <td>1993</td> <td>63.5</td> <td>66.5</td> <td>69.5</td> <td>72.5</td> </tr> <tr> <td>1994</td> <td>75.5</td> <td>78.5</td> <td>81.5</td> <td>84.5</td> </tr> </tbody> </table>			Year	I Quarter	II Quarter	III Quarter	IV Quarter	1990	27.5	30.5	33.5	36.5	1991	39.5	42.9	45.5	48.5	1992	51.5	54.5	57.5	60.5	1993	63.5	66.5	69.5	72.5	1994	75.5	78.5	81.5	84.5
Year	I Quarter	II Quarter	III Quarter	IV Quarter																														
1990	27.5	30.5	33.5	36.5																														
1991	39.5	42.9	45.5	48.5																														
1992	51.5	54.5	57.5	60.5																														
1993	63.5	66.5	69.5	72.5																														
1994	75.5	78.5	81.5	84.5																														
11	Calculate the Four year Moving Average from the following figure	10	CO2	K5, K6																														

Year	Export (in crores)	Year	Export (in crores)	Year	Export (in crores)
1	82	8	86	15	92
2	84	9	87	16	90
3	85	10	85	17	91
4	90	11	88	18	94
5	92	12	91	19	93
6	93	13	94	20	95
7	89	14	95		

12	Give the Python Implementation for the Following a. VARMA Model with Auto ARIMA b. CoIntegrated Augmented Dickey-Fuller test					10	CO3	K1
----	--	--	--	--	--	----	-----	----

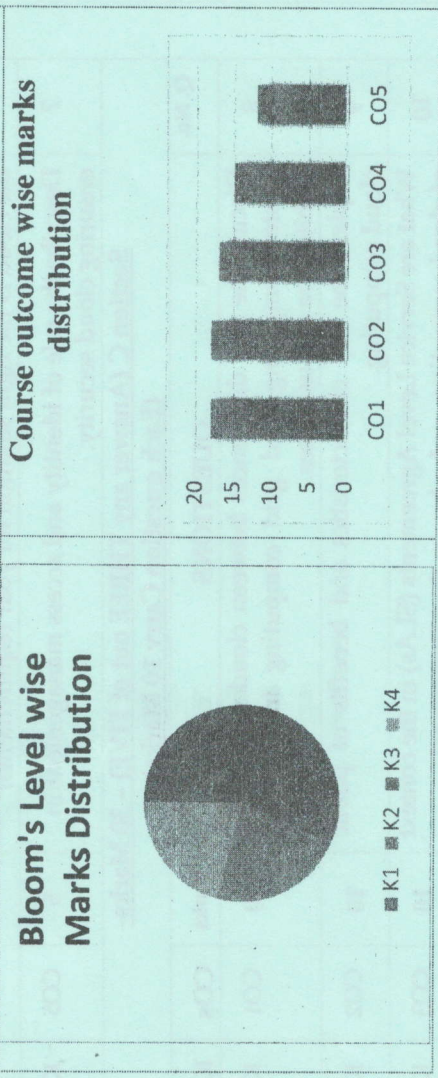
3/5/24 M 100

Program	Bachelor of Computer Application (AI Specialization)	
Subject Name	Cloud Deployment And Management	Semester VI Year April 2024
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 Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will come under Unfair Means and will Result in the Cancellation of the Papers. 	
Knowledge Level (KL)	K1 : Remembering K2 : Understanding	K3 : Applying K4 : Analysing K5 : Evaluating K6 : Creating

Q. N1	QUESTIONS	Marks	COs	KL
i	Which of the following is a type of cloud computing service? a) Service-as-a-Software (SaaS) b) Software-and-a-Server (SaaS) c) Software-as-a-Service (SaaS) d) Software-as-a-Server (SaaS)	2	CO1	K1
ii	Which of the following is not a type of cloud server? a) Public Cloud Servers b) Private Cloud Servers c) Dedicated Cloud Servers d) Merged Cloud Servers	2	CO2	K2
iii	Azure is Microsoft's _____ as a Service Web hosting service. a) Platform b) Software c) Infrastructure d) All of the mentioned	2	CO4	K1
iv	Which of the following is an example of a SaaS cloud service? a) Google Workspace b) Dropbox c) Salesforce d) All of the above	2	CO4	K2

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

CO1	Analyze the components of cloud computing showing how business agility in an organization can be created
CO2	Evaluate the deployment of web services from cloud architecture
CO3	Critique the consistency of services deployed from a cloud architecture
CO4	Compare and contrast the economic benefits delivered by various cloud models based on application requirements, economic constraints, and business requirements.
CO5	Critically analyze case studies to derive the best practice model to apply when developing and deploying cloud based applications



v	Which of the following is not a backup category? a) Full system backup b) Half system backup c) Image backup d) All of the mentioned	2	CO1	K1
vi	Which of the following are the features of cloud computing? a) Security b) Availability c) Large Network Access d) All of the mentioned	2	CO2	K2
vii	Point out the correct statement. a) QoS levels may be applied to different services against a single virtual storage container b) An SLA might specify that a particular Quality of Service (QoS) for a virtual storage container may be measured in terms of the I/O per second c) To provide for scaling, a virtual storage container must be easily migrated from one storage system to another d) All of the mentioned	2	CO3	K2
viii	Applications such as a Web server or database server that can run on a virtual machine image are referred to as a) Virtual server b) Virtual appliances c) Machine imaging d) All of the mentioned	2	CO5	K1
ix	Applications and services that run on a distributed network using virtualized resources is known as a) Parallel computing b) Soft computing c) Distributed computing d) Cloud computing	2	CO3	K1
x	Which of the following service creates an application hosting environment? a) EBS b) Azure App Fabric c) ESW d) All of the mentioned	2	CO2	K2

Section B (Answer any FOUR out of SIX) - 20 Marks

(Each question Carry 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Explain the benefits of cloud computing for organizations in terms of cost, scalability, and flexibility.	5	CO1	K1
3	Explain the networks in cloud computing. What protocols are commonly used for communication between cloud components?	5	CO2	K2
4	Explain software as a service (SaaS) models.	5	CO3	K3
5	Discuss the concept of scalability in cloud services and how it is achieved.	5	CO2	K1
6	What factors should be considered when determining if the cloud is the right solution for your requirements?	5	CO4	K2
7	Describe the role of identity and access management in ensuring cloud security.	5	CO5	K3

Section C (Answer any THREE out of FIVE) - 30 Marks-

(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Discuss the key differences between cloud computing, cluster computing, and grid computing in terms of architecture and use cases.	10	CO1	K1
9	Explain the key characteristics and benefits of public cloud computing.	10	CO2	K2
10	What are Service Level Agreements (SLAs) in the context of cloud computing, and why are they important?	10	CO3	K3
11	Explain the benefits of using cloud-based development platforms for application development.	10	CO4	K1
12	Explain the concept of security in cloud computing and its significance.	10	CO5	K2

01/05/24 M.172



ARKA JAIN
University
Jharkhand



NAAC
GRADE
ACCREDITED UNIVERSITY

END SEM EXAMINATION
School of Engineering & IT

Program	Bachelor of Computer Application (Data Science)		
Subject Name	No SQL Databases	Semester	VI
		Year	April 2024
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 Phones</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussing with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result in the Cancellation of the Papers.</u> 		
Knowledge Level (KL)	K1 : Remembering K2 : Understanding	K3 : Applying K4 : Analysing	K5 : Evaluating K6 : Creating

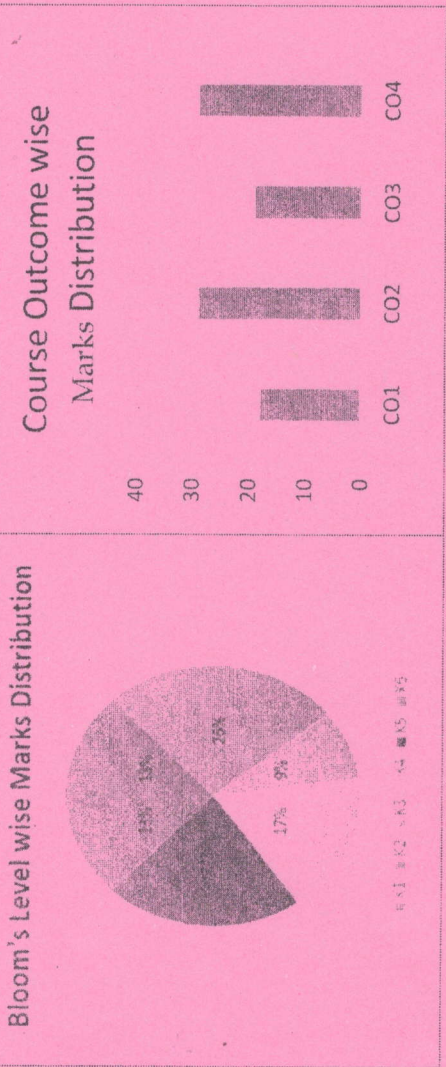
Section A (Each question Carry 02 Marks from Q1-i to x) – 20 Marks

Q. N1	QUESTIONS	Marks	COs	KL
i	Give the feature of NoSql.	2	CO4	K4
ii	Name three features commonly found in NoSQL databases	2	CO1	K2
iii	How does Map Reduce function within the context of NoSQL databases?	2	CO3	K5
iv	Discuss the potential challenges associated with implementing a NoSQL approach.	2	CO2	K2
v	Explain the structure of data in a key-value store and provide examples of data types commonly stored.	2	CO1	K4
vi	What is the significance of connected data in graph databases?	2	CO2	K5
vii	Discuss the role of programming languages in NoSQL database development.	2	CO1	K4
viii	Provide one feature of document databases.	2	CO1	K3
ix	Give an example of a complex transaction that might be handled by a NoSQL database.	2	CO4	K2
x	What role does Map Reduce play in NoSQL databases?	2	CO3	K1

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

CO1	Analyze the Data model of storing and retrieving Data.
CO2	Use of Collection and Document
CO3	Demonstrate the concepts Transactions Spanning different Operations
CO4	Analyze the need of NoSQL Key/Value databases in Modern web development

GRAFICAL REPRESENTATION



Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	What are the key features of NoSQL databases?	5	CO2	K2
3	Define MapReduce and how it is applied in databases for distributed computing.	5	CO4	K4
4	What are the key features of a column-family data store, and how do they affect query performance?	5	CO3	K2
5	Describe the features of Riak as a NoSQL key/value database.	5	CO4	K3
6	Describe the features of Neo4j as a graph NoSQL database.	5	CO5	K5
7	How are data elements connected in a graph database like Neo4j?	5	CO4	K3

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

Q. No.	QUESTIONS	Marks	COs	KL
8	Compare the key characteristics of MongoDB, Cassandra, HBase, and Neo4j.	10	CO1	K5
9	Define MapReduce and how it is applied in databases for distributed computing.	10	CO2	K2
10	Explain how graph databases handle routing, dispatch, and location-based services, such as finding the shortest path between two nodes in a network.	10	CO2	K4
11	What is a key/value database, and how does it differ from other types of NoSQL databases?	10	CO3	K5
12	Provide examples of suitable use cases for column-oriented NoSQL databases like Apache HBase, including content management systems.	10	CO4	K4



ARKA JAIN University
Jharkhand



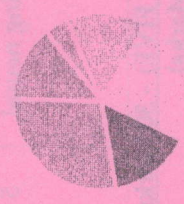
END SEM EXAMINATION
School of Engineering & IT

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

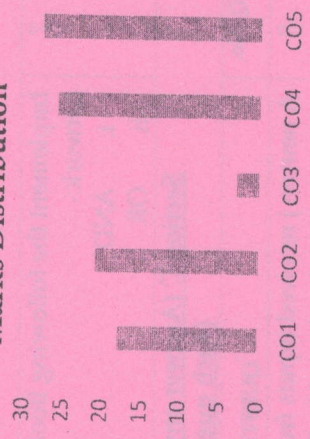
Course Outcomes	CO1	Understand the importance of the stages in the software development life cycle.
	CO2	Understand the various process models.
	CO3	Understand the UML notation.
	CO4	Be able to design software by applying the software engineering principles.

GRAFICAL REPRESENTATION

Bloom's Level wise Marks Distribution



Course Outcome Wise Marks Distribution



Branch	Bachelor of Computer Application (Artificial Intelligence)	
Subject Name	Artificial Neural Networks	Semester VI
		Year April 2024

- Time: 3 Hour
Max. Marks : 70
- 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 Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will come under Unfair Means and will Result in the Cancellation of the Papers.

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. N1	QUESTIONS	Marks	COs
i	Artificial neural network used for a) Pattern Recognition b) Classification c) Clustering d) All of above	2	CO3 K4
ii	The fundamental unit of network is a) Brain b) Nucleus c) Neuron d) Axon	2	CO1 K2
iii	An artificial neuron receives n inputs $x_1, x_2, x_3, \dots, x_n$ with weights w_1, w_2, \dots, w_n attached to the input links. The weighted sum _____ is computed to be passed on to a non-linear filter Φ called activation function to release the output. a) $\sum w_i$ b) $\sum x_i$ c) $\sum w_i + \sum x_i$ d) $\sum w_i * x_i$	2	CO3 K3
iv	Signal transmission at synapse is a? a) Physical process b) Chemical process c) Physical & chemical both d) None of the mentioned	2	CO2 K3

v	What is purpose of Axon? a) Receptors b) Transmitter c) Transmission d) None of the mentioned	2	CO1	K1
vi	What is meant by agent's percept sequence? a) Used to perceive the environment b) Complete history of actuator c) Complete history of perceived things d) None of the mentioned	2	CO2	K1
vii	A perceptron has two inputs x_1 and x_2 with weights w_1 and w_2 and a bias weight of w_0 . The activation function of the perceptron is $h(x)$. The output of the perceptron is given by: a) $y = h(w_1x_1 + w_2x_2 + w_0)$ b) $y = h(w_1 + w_2 + w_0)$ c) $y = w_1x_1 + w_2x_2 + w_0$ d) $y = h(w_1x_1 + w_2x_2 - w_0)$	2	CO1	K2
viii	What is an auto-associative network? a) A neural network that contains no loops b) A neural network that contains feedback c) A neural network that has only one loop d) A single layer feed-forward neural network with pre-processing	2	CO3	K3
ix	What is auto-association task in neural networks? a) Find Relation Between 2 Consecutive Inputs b) Related To Storage & Recall Task c) Predicting The Future Inputs d) None Of The Mentioned	2	CO4	K3
x	A 4-input neuron has weights 1, 2, 3 and 4. The transfer function is linear with the constant of proportionality being equal to 2. The inputs are 4, 3, 2 and 1 respectively. What will be the output? a) 30 b) 40 c) 50 d) 60	2	CO1	K2

Section B (Answer any FOUR out of SIX) – 20 Marks (Each question Carry 5 Marks)				
Q.No.	QUESTIONS	Marks	COs	KL
2	Explain the working of an artificial neural network.	5	CO1	K2
3	What do you mean by Linearly separable variable? Explain.	5	CO2	K3
4	Write the differences between Single Layer Perceptron (SLP) and Multilayer Perceptron (MLP).	5	CO4	K3
5	Draw the architecture of MADALINE	5	CO3	K4
6	Write the training algorithm for hetero associative net	5	CO2	K5
7	Implement the following Boolean function using neural network:- i. AND ii. OR	5	CO4	K1
Section C (Answer any THREE out of FIVE) – 30 Marks- (Each question Carry 10 Marks)				
Q.No.	QUESTIONS	Marks	COs	KL
8	A neuron j received inputs from four other neurons whose activity levels are 10, -20, 4 & -2. The respective synaptic weights of neuron j are 0.8, 0.2, -1 & -0.9. Calculate the output of neuron j which has a linear activation function	10	CO2	K2
9	Draw McCulloch-pits AND function neuron & OR function neuron.	10	CO4	K3
10	Discuss the Perceptron training rule. Under what conditions the Perceptron rule fails and it becomes necessary to apply the delta rule? What are the limitations of Perceptron Training Rule?	10	CO1	K3
11	What is Gradient decent algorithm? Explain Gradient decent algorithm with the help of example. Write down the use of Gradient decent algorithm? Does Gradient decent provide local minimum?	10	CO4	K4
12	Draw the architecture of a single layer perceptron (SLP) and explain its operation. Mention its advantages and disadvantages.	10	CO2	K5