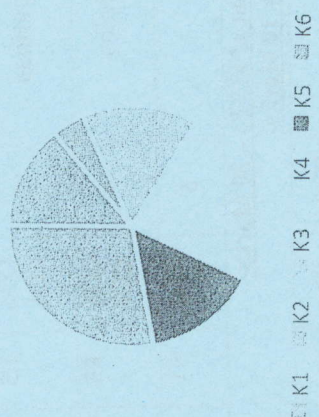


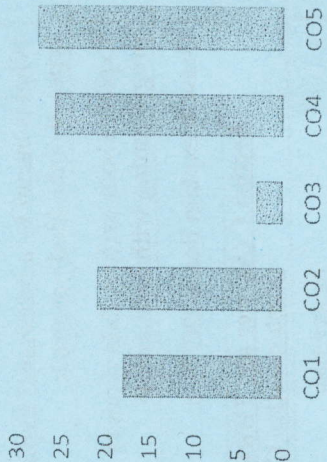
CO1	Understand hardware and software design requirements of embedded systems.
CO2	Analyze the embedded systems' specification and develop software programs.
CO3	Evaluate the requirements of programming Embedded Systems, related software architectures and tool chain for Embedded Systems.
CO4	Specialize in Embedded system design using Arduino.

GRAFICAL REPRESENTATION

Bloom's Level wise Marks Distribution



Course Outcome Wise Marks Distribution





ARKA JAIN University
Jharkhand

END TERM EXAMINATION
School of Engineering & IT

Branch CS & IT	Program BCA
Subject Name Embedded C with Adruino(IOT)	Semester 6 th
	Year 2023/Even

- 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
 - Graf Paper / Drawing Sheet/ Log Book/ Ledger (please Mention if any)
 - Possession of Mobile Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will comes 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 Q1-x) – 20 Marks					
Q. N1	QUESTIONS	Marks	COs	KL	PO
i	What is the purpose of memory refresh register of Z80? a) To control on-chip SRAM b) To control on-chip DRAM c) To clear cache d) To control ROM	2	CO1, CO3	K1	PO2
ii	Which of the following is a traditional method for emulating the processor? a) CPU simulator b) SDS c) ICE d) Low-level language simulator	2	CO2, CO4	K5	PO2
iii	Which is the single device capable of providing prototyping support for a range of microcontroller? a) Umbrella device b) OTP c) RAM d) ROM	2	CO1, CO2	K2	PO1

iv	Which of the following is the biggest challenge in the cache memory design? a) Coherency b) Memory access c) Size d) Delay	2	CO1, CO4	K4	PO3
v	If the voltage is greater than _____, then the Arduino will destroy. a) 10 b) 30 c) 20 d) 05	2	CO1, CO2, CO3	K1	PO1
vi	Which of the following is a part of RTOS kernel? a) Register b) ISR c) Memory d) Input	2	CO2, CO4,	K5	PO1
vii	Expand PWM full form _____? a) Pulse Width Modulation. b) Pulse Wide Modulation c) Plain width modulation d) None of these	2	CO2, CO3	K5	PO2
viii	Arduino can work on a variety of _____ like windows, Linux, and mac. a) Platforms b) Elements c) Batteries d) Components	2	CO1, CO4	K2	PO1
ix	Which memory storage is widely used in PCs and Embedded Systems? a) EEPROM b) Flash memory c) SRAM d) DRAM	2	CO1, CO2, CO3	K4	PO3
x	Which of the following task swapping method is a better choice in the embedded systems design? a) Time slice b) RMS c) Cooperative multitasking d) Pre-emptive	2	CO1, CO2, CO3	K1	PO1

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

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Define an embedded system with a proper example.	5	CO1, CO3	K1	PO2
3	Write down the difference between non-neumann and Harvard architecture.	5	CO2, CO4	K5	PO2
4	Discuss about embedded applications with real time examples?	5	CO1, CO2	K2	PO1
5	What is meant by a processor? Explain various types of embedded processor	5	CO2, CO4,	K5	PO1
6	Explain about various data types of Arduino programming with an example	5	CO2, CO3	K5	PO2
7	Draw & explain Board I2C Pins.	5	CO1	K1	PO1

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

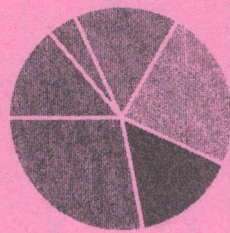
Q. No.	QUESTIONS	Marks	COs	KL	PO
8	What is Raspberipi? Explain in details.	10	CO2, CO3	K4	PO2
9	Define embedded system and also specify the background history of embedded systems?	10	CO1, CO4	K2	PO1
10	What is Arduino UNO board? Explain overview of arduino UNO board with neat and clean diagram.	10	CO1, CO3	K4	PO3
11	Write & explain various Big Data Analytics Tools and Technology.	10	CO2, CO3	K1	PO1
12	Elaborate the process of a central heating controller and develop an embedded C program for central heating system?	10	CO2, CO4	K5	PO2

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

CO1	Understand basic concepts of neural networks.
CO2	Use neural networks to perform classification for single class and multiclass problems.
CO3	Learn and apply the concept of self-organizing maps.
CO4	To be able to formalize the problem, to solve it by using a neural network

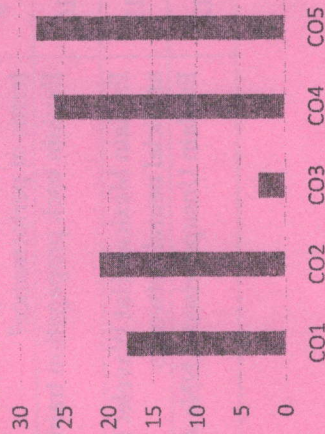
GRAFICAL REPRESENTATION

Bloom's Level wise Marks Distribution



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome Wise Marks Distribution



ARKAJAIN University
Jharkhand

END TERM EXAMINATION
School of Engineering & IT

Branch	CS & IT	Program	BCA
Subject Name	Artificial Neural Network (IOT)	Semester	6 th
		Year	2023/ Even
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 Graf Paper / Drawing Sheet/ Log Book/ Ledger (please Mention if any) Possession of Mobile Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will comes 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

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

Q. N 1	QUESTIONS	Marks	COs	KL	PO
i	What is supervised learning? a) weight adjustment based on deviation of desired output from actual output b) weight adjustment based on desired output only c) weight adjustment based on actual output only d) none of the mentioned	2	CO1	K1	PO2
ii	What is an activation value? a) Weighted sum of inputs b) Threshold value c) Main input to neuron d) None of the mentioned	2	CO4	K3	PO3
iii	What is auto-association task in neural networks? a) Find relation between 2 consecutive inputs b) Related to storage & recall task c) Rredicting the future inputs d) None of the mentioned	2	CO3	K6	PO1
iv	What was the 2nd stage in perceptron model called? a) Sensory units b) Summing unit c) Association unit d) Output unit	2	CO2	K1	PO8

v	In feedforward network, the associations corresponding to input - output patterns are stored in? a) Activation state b) Output layer c) Hidden layer d) None of the mentioned	2	CO2	K2	PO6
vi	Correlation learning law is special case of? a) Hebb learning law b) Perceptron learning law c) Delta learning law d) LMS learning law	2	CO3	K2	PO9
vii	Who invented perceptron neural networks? a) McCulloch-pitts b) Widrow c) Minsky & papert d) Rosenblatt	2	CO1	K6	PO4
viii	What is plasticity in neural networks? a) Input pattern keeps on changing b) Input pattern has become static c) Output pattern keeps on changing d) Output is static	2	CO2	K3	PO4
ix	What is the objective of associative memories? a) To store patterns b) To recall patterns c) To store association between patterns d) None of the mentioned	2	CO2	K4	PO6
x	What was the main deviation in perceptron model from that of MP model? a) More inputs can be incorporated b) Learning enabled c) All of the mentioned d) None of the mentioned	2	CO3	K3	PO3

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

(Each question Carry 5 Marks)


Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Write a short note on Adaptive Resonance Theory.	5	CO2	K2	PO2
3	What is the advantages of Artificial Neural Network (ANN)?	5	CO1	K5	PO5
4	Write down the applications of Sigmoid Function.	5	CO4	K6	PO9

5	Explain Hebbian learning rule.	5	CO3	K1	PO3
6	How do artificial neural networks work?	5	CO2	K4	PO8
7	Explain how would you train Perceptron?	5	CO3	K2	PO7

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

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Explain adaptive learning theory (ART).	10	CO2	K3	PO9
9	How do SOMs compare with k-means clustering in terms of performance?	10	CO4	K5	PO4
10	Explain back propagation training algorithm	10	CO3	K1	PO7
11	Explain Mexican Hat Wavelet Differential equation artificial neural networks	10	CO1	K3	PO5
12	Explain Unsupervised ANNs Algorithms.	10	CO4	K6	PO9

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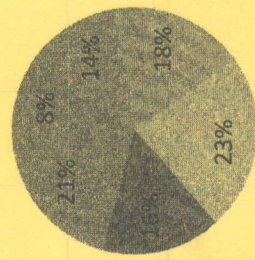
 ARKAJAIN University Jharkhand		END TERM EXAMINATION School of Engineering & IT	
Branch	CS&IT	Program	BCA
Subject Name	Software Engineering	Semester	6th
		Year	2023/ Even
Time: 3 Hour Max. Marks : 70	<ul style="list-style-type: none"> Start writing from 2nd page onwards; don't Write on the 1st Page Backside 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 Graf Paper / Drawing Sheet/ Log Book/ Ledger (please Mention if any) Possession of <u>Mobile Phones</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussing with Co-Student</u> will comes under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Papers.</u> 		
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Q. N1	QUESTIONS	Marks	COs	KL	PO
i	In which step of SDLC actual programming of software code is done? a) Development and Documentation b) Maintenance and Evaluation c) Design d) Analysis	2	CO1	K1	PO1
ii	Software Debugging is known as a) identifying the task to be computerized b) creating program code c) creating the algorithm d) finding and correcting errors in the program code	2	CO2	K3	PO2
iii	Selection of a model is based on a) Requirements b) Development team & Users c) Project type and associated risk d) All of the mentioned	2	CO2	K2	PO3
iv	Software engineering approach is used to achieve: a) Better performance of hardware b) Error free software c) Reusable software d) Quality software product	2	CO1	K2	PO4

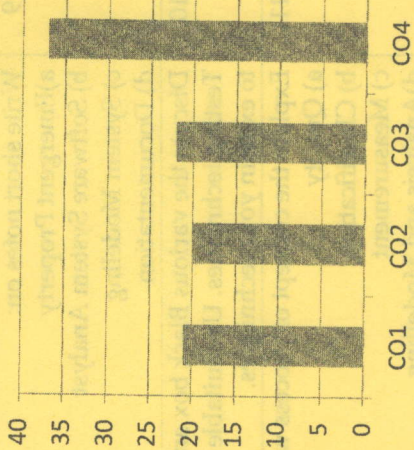
CO- Course Outcomes,	KL- Knowledge Level,	PO – Program Outcome
CO1	Understand the importance of the stages in the software development life cycle	
CO2	Understand the various process model.	
CO3	Understand the UML notation	
CO4	Be able to design software by applying the software engineering principles	

GRAFICAL REPRESENTATION

Bloom Level Wise Marks Distribution



Course outcome wise marks distribution



■ KL1 ■ KL2 ■ KL3 ■ KL4 ■ KL5 ■ KL6

v	Waterfall model is not suitable for a) small projects b) accommodating change c) complex projects d) none of the above	2	CO2	K4	PO1
vi	RAD stands for a) Rapid application development b) Relative application development c) Ready application development d) Repeated application development	2	CO2	K1	PO5
vii	What are the attributes of good software? a) Software maintainability b) Software maintainability & functionality c) Software functionality d) Software development	2	CO3	K2	PO1
viii	Efficiency in a software product does not include a) Processing time b) Responsiveness c) Licensing d) Memory utilization	2	CO2	K2	PO4
ix	What is the first step in the software development lifecycle? a) Preliminary Investigation and Analysis b) System Testing c) System Design d) Coding	2	CO1	K1	PO2
x	Purpose of process is to deliver software a) in time b) with acceptable quality c) that is cost efficient d) both in time & with acceptable quality	2	CO4	K1	PO4

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

(Each question Carry 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	What is Software Engineering? Explain the characteristics of Software Engineering.	5	CO3	K2	PO5
3	Explain the importance of scheduling activity in software project planning.	5	CO3	K3	PO3
4	What is Software Testing? Explain two types of Software technique with neat diagram.	5	CO4	K4	PO1
5	What is a Project Management Life Cycle? Explain.	5	CO4	K5	PO4

6	With a neat diagram explain the RAD model. Write down its advantages and disadvantages.	5	CO1	K4	PO1
7	What is Critical System? Explain with proper example & flow diagram.	5	CO4	K5	PO5

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

(Each question Carry 10 Marks)

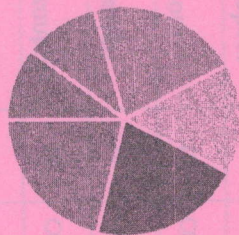
Q. No.	QUESTIONS	Marks	COs	KL	PO
8	What do you understand by System Testing? What are the different kinds of system testing that are usually performed on large software testing.	10	CO1	K4	PO3
9	Write short notes on: a) Emergent Property b) Software System Analyst c) System Modeling d) Documentation	10	CO2	K3	PO1
10	Discuss the various Black box and White Box Testing techniques. Use suitable example to explain your techniques.	10	CO4	K6	PO4
11	Explain the concept of process with a) Quality b) Classification c) Measurement d) Analysis and Modelling	10	CO3	K5	PO5
12	Explain Software requirement Engineering Process with neat diagram. Explain type of system models.	10	CO4	K6	PO2

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 of Transactions Spanning different Operations
CO4	Analyse the need of NoSQL Key/Value databases in Modern web development

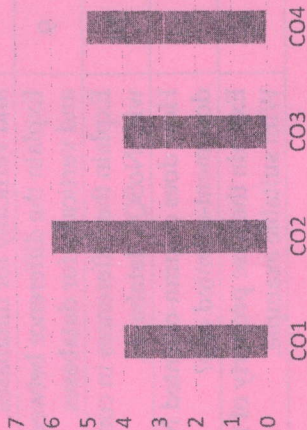
GRAFICAL REPRESENTATION

Bloom's Level wise Marks Distribution



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome Wise Marks Distribution



ARKAJAIN University
Jharkhand

Branch	CS & IT
Subject Name	NoSQL Databases (DS)
Program	BCA
Semester	6th
Year	2023/ Even

• 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**

• **Graf Paper/ Drawing Sheet/ Log Book/ Ledger (please Mention if any)**

• **Possession of Mobile Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will comes 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 Q1-x) – 20 Marks

Q. N1	QUESTIONS	Marks	COs	KL	PO
i	_____ command display the list of databases. a) Show db b) Show dbs c) Show data d) Display dbs	2	CO1	K2	PO1
ii	Which of the following also returns a list of databases? a) Show databases b) Show database c) Display dbs d) All of the mentioned	2	CO2	K3	PO2
iii	Which of the following is a wide-column store? a) Cassandra b) Riak c) MongoDB d) Redis	2	CO2	K5	PO3
iv	Which of the following method is used to query documents in collections? a) Find b) Move c) Shell d) Replace	2	CO4	K2	PO4

5	Write down the NoSQL's different features.	5	CO2	K5	PO2
6	Why MongoDB is the best NoSQL database?	5	CO1	K1	PO3
7	How does MongoDB provide concurrency?	5	CO2	K6	PO3
Section C (Answer any THREE out of FIVE) – 30 Marks- (Each question Carry 10 Marks)					
Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Explain the difference between scaling horizontally and vertically for databases.	10	CO2	K3	PO7
9	Explain the difference between scaling horizontally and vertically for databases.	10	CO3	K4	PO7
10	Explain the differences in conceptual data design with NoSQL databases.	10	CO4	K5	PO5
11	How does column-oriented NoSQL differ from document-oriented one?	10	CO3	K5	PO3
12	Explain the base property of the NoSQL database. With suitable example.	10	CO2	K4	PO4

v	Which of the following is not a NoSQL database? a) SQL Server b) MongoDB c) Cassandra d) None of the mentioned	2	CO3	K1	PO2
vi	Point out the correct statement. a) MongoDB is classified as a NoSQL database b) MongoDB favours XML format more than JSON c) MongoDB is a column-oriented database store d) All of the mentioned	2	CO4	K5	PO6
vii	_____ does not dump the content of the local database. a) Mongoose b) Mongodump c) MongoLocaldump d) None of the mentioned	2	CO3	K6	PO5
viii	Which of the following is a wide-column store? a) Cassandra b) Riak c) MongoDB d) Redis	2	CO2	K6	PO1
ix	_____ is a routing service for MongoDB shard configurations that processes queries from the application layer. a) Mongod b) Mongos c) Mongocon d) None of the mentioned	2	CO1	K3	PO2
x	MongoDB provides high _____ with replica sets. a) performance b) availability c) scalability d) none of the mentioned	2	CO4	K3	PO6

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

(Each question Carry 5 Marks)

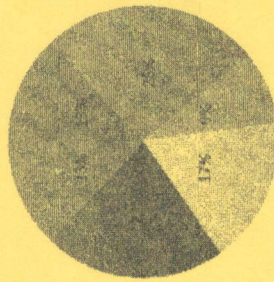
Q. No.	QUESTIONS	Marks	COs	KL	PO
2	What do you understand by NoSQL?	5	CO1	K5	PO1
3	How many types of mechanism works in NoSQL? Write down their name.	5	CO2	K4	PO1
4	What are the features of MongoDB?	5	CO4	K6	PO5

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

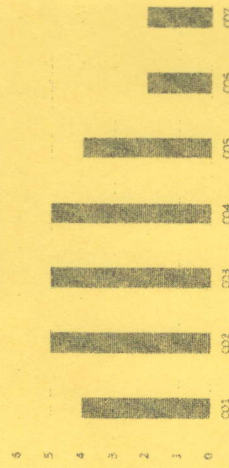
CO1	To understand the basic concepts of time series analysis.
CO2	To understand the elementary time series models and model evaluation techniques.
CO3	To understand the integration process of non-stationary data set.
CO4	To understand the importance of ARMA and ARIMA models for forecasting.
CO5	To understand 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



COURSE OUTCOME WISE MARKS DISTRIBUTION



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

		ARKAJAIN University Jharkhand		END TERM EXAMINATION School of Engineering & IT	
				Branch: CS & IT	Program: BCA
Subject Name: Time Series Analysis(DS)		Semester: 6 TH	Year: 2023/ Even		
• 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.					
Time: 3 Hour Max. Marks : 70					
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 Q1-x) - 20 Marks

Q. N1	QUESTIONS	Marks	COs	KL	PO
i	Define ARCH	2	CO5	K4	PO1
ii	Define ACF	2	CO1	K2	PO2
iii	List out Four Component of Time Series Analysis	2	CO3	K5	PO3
iv	Write the Formula for Multiplicative time Series	2	CO2	K2	PO4
v	Explain exponential smoothing	2	CO1	K4	PO5
vi	Define Strong Stationarity	2	CO2	K5	PO1
vii	What is Differencing	2	CO1	K4	PO4
viii	Explain Seasonality	2	CO1	K3	PO2
ix	Write up the derivation result of AutoCovariance	2	CO4	K2	PO4
x	Write the Full Form of PACF and KPSS	2	CO3	K1	PO2

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

(Each question Carry 5 Marks)

Q. No.	QUESTIONS	Marks	Cos	KL	PO
2	What do you understand about Time Series Analysis? List out and Explain the Components of the Time Series Analysis?	5	CO4,C O5	K2	PO5
3	Explain the plotting of Autocovariance and correlation Function using Python?	5	CO4	K4	PO3
4	What do you understand by Autoregressive Model? List out the steps involved in the Moving average Process?	5	CO7	K2	PO1
5	Define Simple Exponential Smoothing? What are the different types of simple exponential smoothing?	5	CO4	K3	PO4
6	What do you understand by stationarity? Differentiate between Strong and Weak Stationarity?	5	CO2 CO5	K5, K6	PO1
7	Give the Derivation for Autocorrelation Function.	5	CO4	K3	PO4

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

(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	Cos	KL	PO
8	How do we calculate the Following using Python a. ADF Test b. KPSS Test	10	CO2, CO3, CO6	K5, K6	PO3
9	a. What do you understand by ARIMA model? b. Briefly explain The Diagnostic Checking method used in Box Jenkins Method of Analyzing Time Series?	10	CO6	K2	PO1
10	Find seasonal variation by the ratio-trend method from the data given below	10	CO7	K1	PO4

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	Give the Python Implementation for the following 1. ARCH 2. GRACH	10	CO2, CO3, CO5	K5, K6	PO5
12	Give the Python Implementation for the Following a. VARMA Model with Auto ARIMA b. Cointegrated Augmented Dickey-Fuller test	10	CO3	K1	PO2