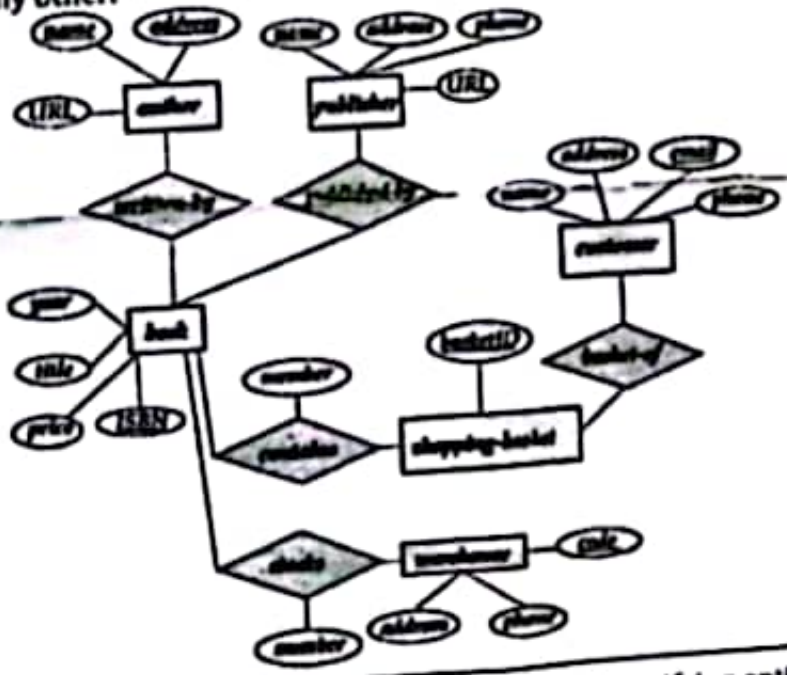
QUAID-E-AWAM UNIVERSITY OF ENGINEERING, [illegible]

MID-SEMESTER EXAMINATION OF SECOND SEMESTER – SECOND YEAR (4TH SEMESTER) 2022, 20 BATCH, B.S (CS)

SUBJECT: DATABASE SYSTEMS

Dated: 21.11.2022 Maximum Marks: 20 Time Allowed: 1 Hour.

NOTE: ATTEMPT ANY TWO (02) QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.		Question	CLOs	Taxonomy Level	PLOs	Marks
Q. 01	(a)	Due to its nature of controlled redundancy and consistency in data, database approach is preferred over traditional file-based approach; explain these two features of database approach with the help of an example.	1	C2	2	05
	(b)	What is data model? Describe conceptual, logical, and physical data models with the help of an example	1	C2	2	05
Q. 02	(a)	Explain why ER diagram is useful in designing the database? Give definitions of derived attribute, weak entity, and composite primary key with the help of an example.	2	C5	4	05
	(b)	Write detailed specification of the following ER diagram of an online bookstore. For each relationship identify its type 1-1, 1-M, or any other. 	2	C5	4	05
Q. 03	(a)	Design an ER diagram for the general store by identifying entities, attributes, constraints, and relationships. Note: at minimum the store must contain information about products, purchases, sales, customer, stock, and cash.	2	C5	4	05
	(b)	For the online bookstore database given in Q. 02 (b), write the following queries in SQL. i. Add a new field 'cnic' of type 'varchar (15)' in 'customer' entity. ii. Delete records of books published in the year 2010. iii. Change the 'publisher' address from 'Karachi' to 'Lahore'. iv. Change the data type of 'code' field from 'varchar (10)' to 'text'. v. Drop the 'URL' field from 'author' entity.	2	C5	4	05

The End

QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

MID SEMESTER EXAMINATION OF SECOND SEMESTER – SECOND YEAR (4TH SEMESTER) 2022, 20 BATCH, B.S (CS)

SUBJECT: STATISTICS AND PROBABILITY

Dated: 22.11.2022 Maximum Marks: 20 Time Allowed: 01 Hour

NOTE: ATTEMPT ANY TWO (02) QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.		Question	CLOs	Taxonomy Level	PLOs	Marks
Q. 01		Nixon Corporation manufactures computer monitors. The following data are the numbers of computer monitors produced at the company for a sample of 30 days. 24 32 27 23 33 33 29 25 23 28 21 26 31 22 27 33 27 23 28 29 31 35 34 22 26 28 23 35 31 27				
	(a)	Construct a frequency distribution table using the classes 21-23, 24-26, 27-29, 30-32, and 33-35.	1	C2	PLO-2	05
	(b)	Construct a histogram for the frequency distribution.	1	C2	PLO-2	03
	(c)	For what percentage of the days is the number of computer monitors produced in the interval 27-29?	1	C2	PLO-2	02
Q. 02		The following table gives the total number of DVDs sold at retail stores between 2003 and 2008				

Year	Retail Sales of DVDs
2003	11
2004	15
2005	16
2006	16
2007	15
2008	15

	(a)	Briefly explain a member, a variable, a measurement, and a data set with reference to this table, and mention the type of data (quantitative or qualitative).	1	C2	PLO-2	06
	(b)	Why do we need to group data in the form of a frequency table? Explain briefly.	1	C2	PLO-2	04
Q. 03	(a)	Why is conducting a sample survey preferable to conducting a census?	1	C2	PLO-2	03
	(b)	Can the standard deviation have a negative value? Explain	1	C2	PLO-2	03
	(c)	Write one advantage of each Mean, Median, and Mode.	1	C2	PLO-2	04

Good Luck

QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

MID SEMESTER REGULAR EXAMINATION OF SECOND SEMESTER – SECOND YEAR, 2022 OF 20-BATCH, B.S (CS)

SUBJECT: VISUAL PROGRAMMING

ted: 23.11.2022 Maximum Marks: 20 Time Allowed: 01 Hour,

TE: ATTEMPT ANY TWO (02) QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.		Question	CLO	Taxonomy Level	PLO	Marks
01	(a)	Discuss the object references and garbage collection process.	1	C2	2	05
	(b)	Differentiate between static and non-static member methods with code examples.	1	C2	2	05
02	(a)	What is constructor? Discuss constructor overloading with code example.	1	C2	3	05
	(b)	What are the properties? Show example class that uses properties.	1	C2	3	05
. 03		What components/controls would you use to design a simple arithmetic calculator application? Write code for a simple calculator application that performs add, subtract, multiply and divide operations.	1	C2	2	10

The End

QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

MID-SEMESTER EXAMINATION OF SECOND SEMESTER – SECOND YEAR (4TH SEMESTER) 2022, 29 BATCH, B.S (CS)

SUBJECT: ECONOMICS

Dated: 25.11.2022 Maximum Marks: 20 Time Allowed: 01 Hour.

NOTE: ATTEMPT ANY TWO QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No		QUESTION	CLO	Taxonomy Level	PLO	Marks
Q. 01	(A)	Why do we study Economics in computer science? How economics is related to computer science? Also, describe why the computer is important in economics.	1	C1	1	05
	(B)	What are the main reasons to study economics? Also, discuss the importance of economics.	1	C1	1	05
02		What is Economics? Briefly discuss microeconomics and macroeconomics. Also, discuss economic resources in detail.	1	C1	1	10
03	(A)	Briefly discuss the Demand in economics and its types.	2	C2	2	05
	(B)	What is production and cost analysis? Discuss in detail.	2	C2	2	05

*** Good Luck ***

QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

MID-SEMESTER EXAMINATION OF SECOND SEMESTER – SECOND YEAR (4TH SEMESTER) 2022, 20 BATCH, B.S (CS)

SUBJECT: DESIGN & ANALYSIS OF ALGORITHMS

Dated: 24.11.2022 Maximum Marks: 20 Time Allowed: 01 Hour.

NOTE: ATTEMPT ANY TWO (02) QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.		Question	CLO	Taxonomy Level	PLO	Marks
Q. 01	(a)	Explain Order of growth and asymptotic analysis in detail. And determine whether $f(n) \in O(g(n))$, $f(n) \in \Omega(g(n))$ or $f(n) \in \Theta(g(n))$ where 1) $F(n)=(n+5)\log n$, $g(n)=n^2+\log n$ 2) $F(n)= n2\log n$, $g(n) = 5n^2+n\log n$ 3) $F(n)=n\log n$, $g(n)=n\sqrt{n}$	1	C2	2	05
	(b)	Order the following functions according to their growth from the lowest to highest. $n+\log n$, $n^2+\log n, n+3$, $\log \sqrt{n}+1$, n^3+2n+3, n^3+5n+2, $n!$, 3^{2n}, 3^n, n^{15}, $\log n/n$	1	C4	3	05

Q. 02	(a)	Define recursive relations? Form a recursive relation of the following algorithms.
		`public int g(int n) {`
		`  if (n == 1)`
		`  return 2;`
		`  else`
		`  return 3 * g(n / 2) + g( n / 2) + 5;`
		`}`
		`long fibonacci (int n) { // Recursively calculates Fibonacci number`
		`  if( n == 1 || n == 2)`
		`  return 1;`
		`  else`
		`  return fibonacci(n – 1) + fibonacci(n – 2);`
		`}`
			1	C1	2	05

	(b)	find out the recursive relation of the following and analyze it by means of iterative and tree method.
		`Void Test (int n)`
		`{`
		`  If (n>0) {`
		`  For(i=0; i<n; i++)`
		`  {`
		`  Printf("%d", n);`
		`  }`
		`  Test (n-1);`
		`  }`
		`}`
			1	C4	3	05

Q. 03	(a)	Calculate the time complexities of the following functions using Master Theorem method. 1. $T(n)=9T(n/9)+\log n$ 2. $T(n)=3T(n/4)+n^2$ 3. $T(n)=9T(n/3)+n$ 4. $T(n)=2T(n/2)+n\log n$ 5. $T(n)=T(n/2)+1$	1	C3	3	05
	(b)	Find out the time complexities of the linear and binary search algorithms?	1	C4	3	05

The End

QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

FINAL SEMESTER REGULAR EXAMINATION OF SECOND SEMESTER – SECOND YEAR, 2023 OF 20 BATCH, B.S (CS)

SUBJECT: DATABASE SYSTEMS

Dated: 09.01.2023 | Maximum Marks: 60 | Time Allowed: 3 Hours.

NOTE: ATTEMPT ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.	QUESTION	CLOs	Taxonomy Level	PLOs	Marks
Q. 01	Among others, database approach is preferred over traditional file-based approach due to its features of 'self-describing nature' and 'insulation between program and data'; explain these two features with the help of an example.	1	C2	2	12
Q. 02	For the 'RESULTS' and 'STUDENTS' relations given below, translate following algebraic expressions in SQL and find resultant relation.	2	C5	4	12
Q. 03	What is query optimization? For the relations Book (bookId, Author, Title, Price, Available), Member (memId, Name, Address, iDate, rDate, bookId, pubId), and Publisher (pubId, Name, Address, bookId),	2	C5	4	

RESULTS

SID	CAT	ENO	POINTS
101	H	1	10
101	H	2	8
101	M	1	12
102	H	1	9
102	H	2	9
102	M	1	10
103	H	1	5
103	M	1	7

STUDENTS

SID	FIRST	LAST
101	Ann	Smith
102	Michael	Jones
103	Richard	Turner
104	Maria	Brown

i. $\sigma_{SID=101}(RESULTS)$

ii. $\pi_{ENO\ POINTS}(\sigma_{CAT=H}(RESULTS\ X\ STUDENTS))$

iii. $\pi_{FIRST\ LAST}(STUDENTS \bowtie_{STUDENTS.SID=RESULTS.SID} (\sigma_{CAT=H}(RESULTS)))$

i. translate the following SQL query into relational algebra,

ii. Apply Cartesian, Join and push Selection to simplify and optimize algebraic expression obtained above. Also state your results as an operator tree.

```
select memId from Book, Member, Publisher
where Book.bookId=Publisher.pubId and
Member.pubId=Publisher.pubId and
Book.Author='Lafore' and
Publisher.Address='USA'
```

4	Two thousand randomly selected adults were asked whether or not they have ever shopped on the Internet. The following table gives a two-way classification of the responses. | | Have Shopped | Have never Shopped | | Male | 500 | 700 | | Female | 300 | 500 | If one adult is selected at random from these 2000 adults, find the probability that this adult i. has shopped on the Internet given that this adult is a female ii. is a male iii. Are the events "male" and "female" mutually exclusive? What about the events "have shopped" and "male?" Why or why not? iv. Are the events "female" and "have shopped" independent? Why or why not?	3	C3	3
(a)	A company is to hire two new employees. They have prepared a final list of eight candidates, all of whom are equally qualified. Of these eight candidates, five are women. If the company decides to select two persons randomly from these eight candidates, what is the probability that both of them are women? Draw a tree diagram for this problem.	3	C3	3
(b)	The probability that a randomly selected student from a college is a senior is 20 and the joint probability that the student is a computer science major, and a senior is 03 Find the conditional probability that a student selected at random is a computer science major given that the student is a senior.	3	C3	3

QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

FINAL SEMESTER REGULAR EXAMINATION OF SECOND SEMESTER – SECOND YEAR, 2023 OF 20 BATCH, B.S (CS)

SUBJECT: STATISTICS AND PROBABILITY

Dated: 12.01.2023 Maximum Marks: 60 Time Allowed: 3 Hours.

NOTE: ATTEMPT ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.		QUESTION	CLOs	Taxonomy Level	PLOs	Marks
Q. 01	(a)	A random sample of 40 customers at a shopping center in Nawabshah were asked in a survey about their place of residence. Customers are placed in five categories. Draw a Pie chart.	2	C2	2	06

Categories	E	W	S	C	N
Frequency	7	8	12	10	3

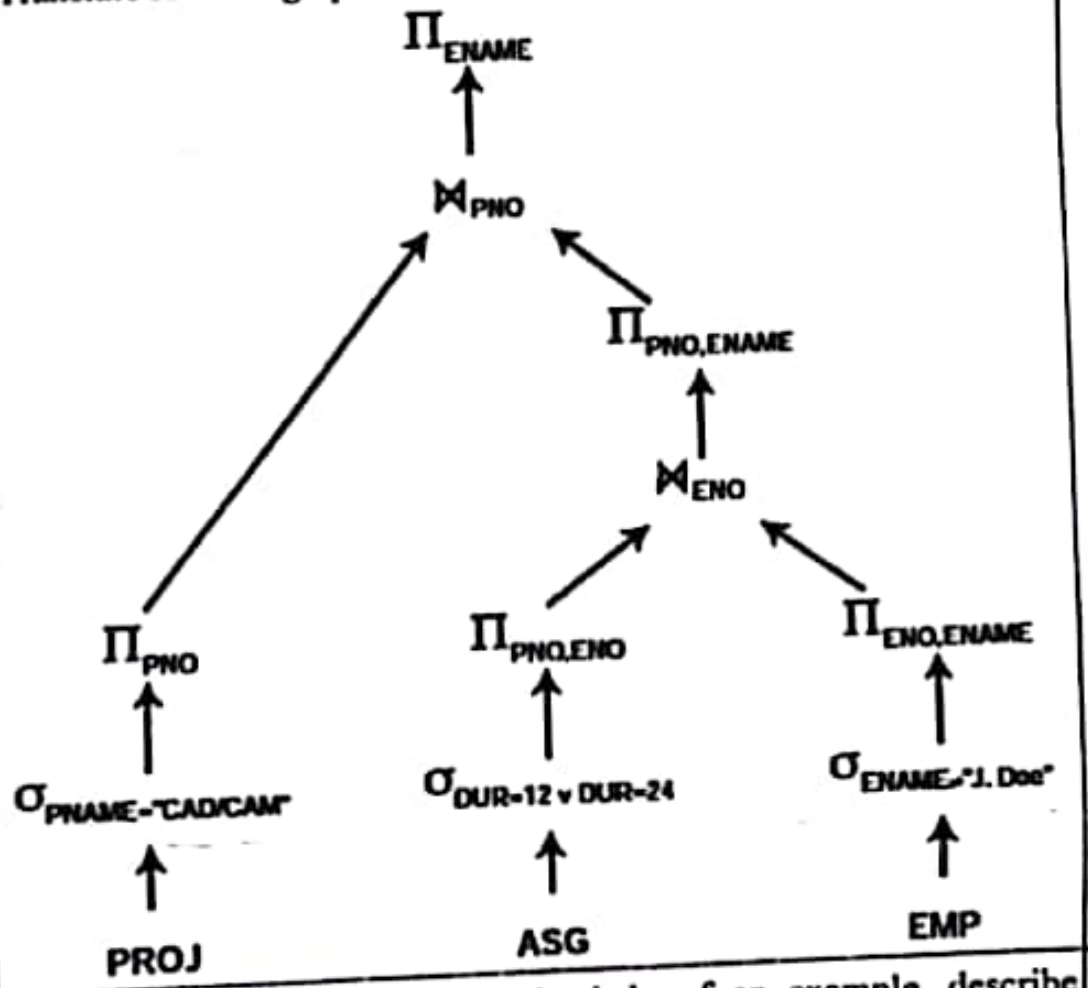
	(b)	The following frequency distribution represents the ages of 30 students in a statistics class. The mean age of the students is 30.3 years. Find the standard deviation of the frequency distribution.	2	C2	2	06

Class	18-25	26-33	34-41	42-49	50-57
f	13	8	4	3	2

.02	(a)	How many different outcomes are possible for four rolls of a die?	3	C3	3	0
	(b)	A man just bought 4 suits, 8 shirts, and 12 ties. All of these suits, shirts, and ties coordinate with each other. If he is to randomly select one suit, one shirt, and one tie to wear on a certain day, how many different outcomes (selections) are possible?	3	C3	3	0
Q. 03	(a)	Student has to answer three problems (Equal chances that the answer to a problem is correct or wrong). What is the probability of getting at least one correct answer?	3	C3	3	0
	(b)	The following table gives the probability distribution of a discrete random variable x.	3	C3	3	0

X	0	1	2	3	4	5	6
P(x)	.11	.19	.28	.15	.12	.09	.06

i. Probability that x assumes a value less than 4
ii. Probability that x assumes a value greater than 2
iii. Probability that x assumes a value in the interval 2 to 5

	(a)	Provide operator tree for each of the algebraic expressions given in Q. 04 above. 02	2	C5	4	0
	(b)	Translate following operator tree in algebraic expression. 	2	C5	4	0
5	(a)	What is normalization? With the help of an example, describe different types of anomalies that may occur in relational databases.	3	C2	3	
	(b)	Bring the folloiwng table in 1ST and 2ND normal forms.	3	C2	3	

stud_name	stud_birth	sub_id	sub_name	marks
Ali	1995	IS102	Java	70
		IS1205	jre	80
ahmed	1995	IS202	c	75
		IS304	c++	80
		IS101	dbs	90

Good Luck

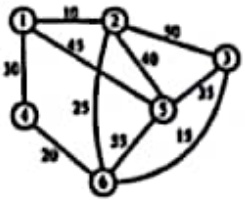
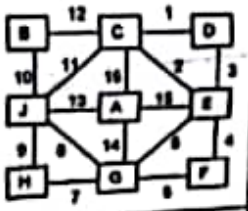
QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

FINAL SEMESTER REGULAR EXAMINATION OF SECOND SEMESTER – SECOND YEAR 2023 OF 20-BATCH, B.S (CS)

SUBJECT: DESIGN AND ANALYSIS OF ALGORITHMS

Dated: 19.01.2023 | Maximum Marks: 60 | Time Allowed: 3 Hours.

NOTE: ATTEMPT ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.		QUESTION	CLO	Taxonomy Level	PLO	Marks
Q. 01		Sort out the following list of data using Merge sort Algorithm, write every step and calculate recursive function of the merge sort, finally calculate its time complexity using Master theorem algorithm. 2 | 4 | 5 | 7 | 1 | 2 | 3 | 6	1	C3	3	12
Q. 02	(a)	Apply the Greedy programming algorithm to the following instance of the fractional-knapsack problem. The Weight capacity W is 24. Item | Weight | Value 1 | 7 | $75 2 | 3 | $40 3 | 9 | $80 4 | 2 | $30 5 | 3 | $25 6 | 4 | $45 7 | 3 | $35	2	C3	3	06
	(b)	Generate the variable code tree using Huffman Code algorithm if we have given a message with the following set of data. Alphabet | Frequency of occurrence a | 45 b | 13 c | 12 d | 16 e | 9 f | 5	2	C5	3	06
Q. 03		Define Graph and MST in detail? Find the MST of the following graph using Kruskal's Algorithm. Write every step and finally describe the time complexity of Kruskal algorithm 	3	C1	3	12
Q. 04		For the following undirected, weighted graph, apply Prim's algorithm to find the minimum Spanning tree (MST) and the cost of the MST. Also list down the order in which the edges of the graph are selected. Show your working for all the intermediate steps. 	3	C3	3	12
Q. 05	(a)	Explain Dynamic Programming and define how it is different from Greedy algorithms?	3	C2	2	06
	(b)	Suppose we have following sequence of Matrices to be multiplied, what would be the best parenthesizing as per DP algorithm. $A_1(3,4) \times A_2(4,4) \times A_3(4,2)$	3	C4	3	06

Good Luck

QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

FINAL SEMESTER REGULAR EXAMINATION OF THE 2ND SEMESTER – 2ND YEAR (4TH SEMESTER), 20-BATCH, B.S (CS)

SUBJECT: ECONOMICS

Dated: 23.01.2023 Maximum Marks: 60 Time Allowed: 03 Hours.

NOTE: ATTEMPT ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

No		QUESTION	CLO	Taxonomy Level	PLO	Marks
01	(A)	Define the characteristics of a competitive market. Also, explain pricing strategies and their types with the example of psychological and penetration pricing.	1	C1	1	05
	(B)	Define the principles and characteristics of the Islamic economic system	1	C1	1	05
Q. 02	(A)	What is market structure? Define marginal and average products with production function and table.	2	C1	2	05
	(B)	What is the cost? Define the fixed, variable, and total costs. Also, explain the relationship between productivity and cost.	2	C1	2	05
Q. 03	(A)	What is macroeconomics? Why we study macroeconomics. Explain the importance of macroeconomics	2	C1	2	05
	(B)	Define and draw the circular flow of the income model. Also, define the significance of the circular flow model	2	C1	2	05
Q. 04		Define economic growth and explain it using the production possibilities model and the concept of potential output	3	C1	3	10
Q. 05	(A)	Discuss the components of the investment. Also, distinguish between gross and net investment	3	C2	3	05
	(B)	Explain how investment affects economic growth	3	C2	3	05

*** Good Luck ***

QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

FINAL SEMESTER REGULAR EXAMINATION OF SECOND SEMESTER – SECOND YEAR, 2021 OF 20 BATCH B.S (CS)

SUBJECT: VISUAL PROGRAMMING

Dated: 16.01.2023 Maximum Marks: 60 Time Allowed: 3 Hours.

NOTE: ATTEMPT ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.		QUESTION	CLO	Taxonomy Level	PLO	Marks
Q. 01	(a)	Briefly describe jagged array and rectangular array. Write code to add two matrices.	1	C1	2	06
	(b)	What are ref and out arguments? Discuss named parameters.	1	C5	2	06
Q. 02	(a)	Differentiate between CheckBox and RadioButton. Write code to change Label font size or font family based on the RadioButton selected.	2	C5	4	06
	(b)	Write code for simple note pad application that reads and writes text data into a file from RichTextBox. The program takes file path using OpenFileDialog and SaveFileDialog for opening and saving file respectively.	2	C5	4	06
Q. 03	(a)	Write code for Log In that checks in the SQL database if the username and password are correct and shows a message "Logged in" if credentials are correct otherwise shows "Invalid credentials".	2	C4	2	06
	(b)	Discuss LINQ in C#. Give some code examples applying different filters on simple list.	2	C4	2	06
Q. 04	(a)	Discuss interfaces in C#.	3	C3	4	06
	(b)	Discuss the process of publishing the application as setup file for distribution.	3	C3	4	06
Q. 05	(a)	Briefly describe inheritance in C#. Give code example for inheritance.	3	C4	3	06
	(b)	What is polymorphism? Write code example to demonstrate polymorphism.	3	C4	3	06

The End