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

FINAL SEMESTER REGULAR EXAMINATION OF FIRST SEMESTER – SECOND YEAR 2022 OF 20-BATCH B.E(

SUBJECT: DATABASE MANAGEMENT SYSTEMS

Dated: 30.05.2022 Maximum Marks: 60 Time Allowed: 3 I

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

Q. No.		QUESTION	CLOs	Taxonomy Level	PLO
Q. 01	(a)	Describe the following symbols of ER model? i. ii. iii. iv.	2	2	4, 5
	(b)	Transform the following ER diagram into relational schema showing the relation names, their attributes, primery key, foregign key to primary key links. 	3	3	3, 5
Q. 02	(a)	Describe the purpose of NORMALIZING the data.	2	2	4, 5
	(b)	Discuss 1NF, 2NF, 3NF and 4NF along with their associated dependencies.	2	2	4, 5
Q. 03		State the short answers the following questions (i) How would you add an attribute MOBILE_NO to the FACULTY table? (ii) Contrast between Foreign key and Primary key (iii) Why we use levels in Data flow diagram. (iv) Enlist the advantages of Relational Database Model (v) Describe the DDL and DML of SQL language	3	1	3, 5
Q. 04		Draw an E-R model and then convert to Relational Database for the following scenario: A laboratory has several chemists who work on one or more projects. Chemists also may use certain kinds of equipment on each project. Attributes of CHEMIST include employee_ID (identifier), Name, and Phone_No. attributes of PROJECT include Project_ID (identifier) and start_Date. Attributes of EQUIPMENT include serial_no and Cost. The organization wishes to record Assign_date i.e the date when an equipment item was assigned to a particular chemist working on a specific project. A chemist must be assigned to at least one project and one equipment item. An equipment item need not be assigned and a given project need not be assigned either a chemist or an equipment item.	4	3	9, 11

P.T.O

Q. 05

The questions refer to the three relations:

SALESPERSON(Name, Age, Salary)

ORDER(Number, CustName, SalespersonName, Amount)

CUSTOMER(Name, City, IndustryType)

Sample data of SALESPERSON:

Name	Age	Salary
Abdullah	63	120000
Baber	38	42000
Junaid	26	36000
Mahmood	42	50000
Zaman	59	118000
Saba	27	34000

Sample data of Customer:

Name	City	IndustryType
AjmalConstruction	HYDR	B
MahmoodCo	LHR	F
TahirBulders	KHI	B
AliConstruction	FSD	B

Sample data of ORDER:

Number	CustName	SalespersonName	Amount
100	AjmalConstruction	Zaman	560
200	AjmalConstruction	Junaid	1800
300	MahmoodCo	Abdullah	480
400	TahirBulders	Manhood	2500
500	AjmalConstruction	Abdullah	700
600	MahmoodCo	Junaid	150

1. Write SQL command to CREATE these tables.
2. Write SQL command to INSTERT data of first row of each table.
3. Show the name and age of all salespeople but omit duplicates.
4. Show the names of all salespeople with age greater than 49 and less than 60 years old.
5. Compute the number of customer.
6. Show the names and salary of all salespersons that have an order with Ajmal construction, in descending order of age.
7. Show the age of salespeople who have an order with customer in HYDR(use a join).
8. Show the industry type and names of the salespeople of all order for companies in Lahore.

4 2

The End

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FINAL SEMESTER REGULAR EXAMINATION OF FIRST SEMESTER – SECOND YEAR, 2022 OF 20-BATCH B.E

SUBJECT: DATA STRUCTURES & ALGORITHMS

Dated: 23.05.2022 Maximum Marks: 60 Time Allowed: 3 I

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

			CLO	Taxonomy Level	
Q. 01	a)	Estimate the running time in terms of input size 'n' for the following program fragments using Big – O notation.	3	5	2

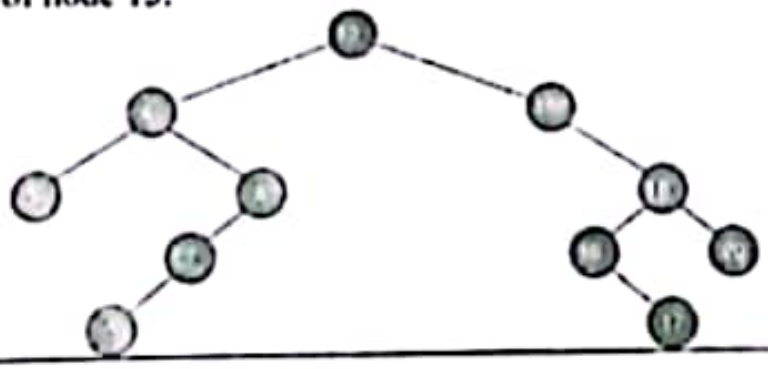
i.
```
for (int i = 0; i < n; i++)
  for (int j = 0; j < n - i - 1; j++)
    if (arr[j] > arr[j + 1])
    {
      int temp = arr[j];
      arr[j] = arr[j + 1];
      arr[j + 1] = temp;
    }
```

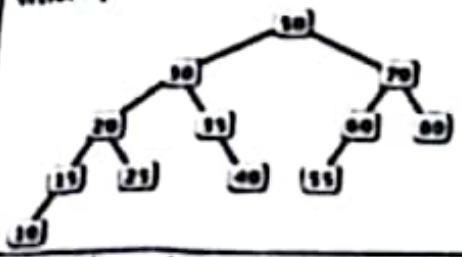
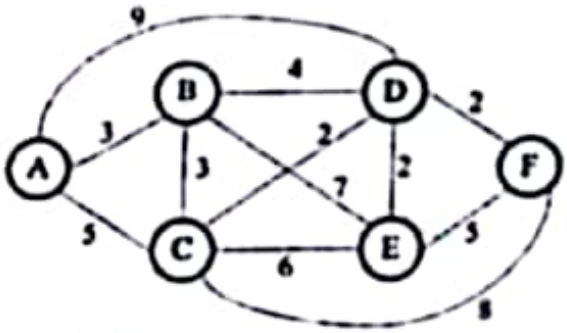
ii.
```
for (int i=1; i<=n; i++)
if (a > 100)
for (int j=1; j<=n; j++)
    sum++;
else
for (int j=1;j<=n*n;j++)
    sum++;
```

iii.
```
for (int i=0; i<n; i++)
    for (int j=0; j<n; j++)
        sum--;
```

iv.
```
for (int i=0; i<n; i++)
    a++;
  for (int j=1; j<=n*n; j++)
    for (int k=0; k<j; k++)
        a--;
```

	b)	Discuss the algorithm for binary search also calculate its time complexity.	1	1	2
Q. 02	a)	Answer the following from the **Binary Search Tree** shown below: i. The tree is Strictly Binary Tree? Justify your answer. ii. The tree is Complete Binary Tree? Justify your answer. iii. Write nodes by applying Post-order traversing. iv. Write nodes by applying Pre-order traversing. v. What will be the resultant tree after insertion of node 9 & 14. vi. After insertion of 9 & 14, what will be the new tree after deletion of node 15.	3	5	2



	b)	Balance the following tree after deletion of node "80". Apply AVL tree balance method and show all the necessary rotations where possible. 	3	5	3
Q. 03	a)	How clustering affects the Hash functions? Discuss why Quadratic Probing is a good technique than Linear Probing in hash tables.	1	2	2
	b)	Discuss the adjacency matrix and chaining method for graphs.	1	1	2
Q. 04	a)	Provide a comparative analysis of AVL Tree with Hashing in the following operations: i. Searching in a dictionary/table ii. Traversal of a table iii. Sorting	3	5	4
	b)	Convert the following graph into the shortest path tree. The source node is "A". 	3	5	4
Q. 05	a)	Which one of the following code utilizes the memory efficiently? Justify your answer.	2	4	3
	b)	Write a C++ program, which stores integer numbers in a circular array.	2	3	3

```
// example 2
int intMinus2( int* oldVal)
{
     *oldVal = *oldVal - 2;
     return *oldVal;
}
void caller()
{
 int retVal;
 int myInt = 31;
 retVal = intMinus2( &myInt );
 cout << myInt << retVal;
}
```

```
// example 3
int intMinus3( int& oldVal)
{
   oldVal = oldVal - 3;
   return oldVal;
}
void caller()
{
     int retVal;
     int myInt = 31;
     retVal = intMinus3( myInt );
     cout << myInt << retVal;
}
```

The End

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FIRST SEMESTER REGULAR EXAMINATION OF FIRST SEMESTER – SECOND YEAR 2022 OF 20-BATCH B.E (SW)

SUBJECT: SOFTWARE REQUIREMENT ENGINEERING

Dated: 02.06.2022 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		Illustrate the components and process of software requirements elicitation.	1	C2	1	12
Q. 02		Define following two types of requirements elicitation techniques: i. Scenarios and its types ii. Storyboarding and its types	2	C1	1	12
Q. 03	(a)	Write a short note on requirements analysis and its stages.	1	C2	1	04
	(b)	What is UML; Why we use it for requirements modeling; further define different types of UML diagrams.	2	C2	3	08
Q. 04		Enlist the major sections of IEEE 830 standard of requirements documentation, and use the standard template to document following sections of a project of your choice: i. Purpose ii. Project scope iii. Product functions iv. Operating environment v. User interfaces vi. Software interfaces vii. Communication interfaces viii. System features X ix. Priority of feature x. Functional requirements	3	C3	3	12
05		Demonstrate any five attributes of well written requirements using suitable examples of not well-written and well-written requirements.	3	C4	2	12

The End

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FINAL SEMESTER REGULAR EXAMINATION OF FIRST SEMESTER – SECOND YEAR 2022 OF 20-BATCH, B.E (SW)

SUBJECT: OPERATING SYSTEMS

Dated: 26.05.2022 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		Considering a system with five processes P_0 through P_4 and three resources of type A, B, C. Resource type A has 10 instances, B has 5 instances and type C has 7 instances. Suppose at time t_0 following Snapshot of the system has been taken:	2	C2	2	12

Process	Allocation	Max	Available
	A B C	A B C	A B C
P_0	0 1 0	7 5 3	3 3 2
P_1	2 0 0	3 2 2	
P_2	3 0 2	9 0 2	
P_3	2 1 1	2 2 2	
P_4	0 0 2	4 3 3	

Answer the following questions using the Banker's Algorithm.

a. What will be the content of the Need matrix?

b. What will happen if process P_1 requests one additional instance of resource type A and two instances of resource type C?

c. Is the system in a safe state? If yes, then what is the safe sequence?

Q. 02		Consider the following data with the length of CPU burst time given in milliseconds:	2	C2	2	12

i> SJF ii> Priority scheduling

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The process has arrived in the order p1, p2, p3, p4, p5 all at time 0.

a. Draw Gantt charts for the execution of these processes using FCFS, SJF, non-preemptive priority and RR (quantum=1) scheduling.

b. What is the turnaround time and waiting time of each process for each of the scheduling algorithm?

Q. 03		Write short answers of the following questions:	2, 3	C2, C3	2, 3	12

i. What is deadlock? Explain the necessary conditions for its occurrence.

ii. What are the Semaphores? Readers/ Writers problem with Semaphore

iii. What are system calls?

iv. Resident set Management.

v. Placement and Replacement policy

P.T.O

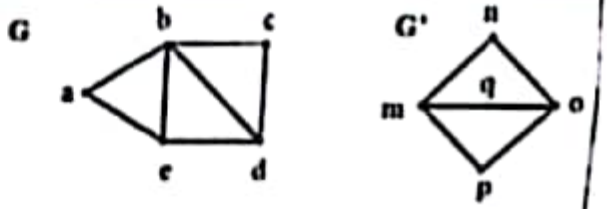
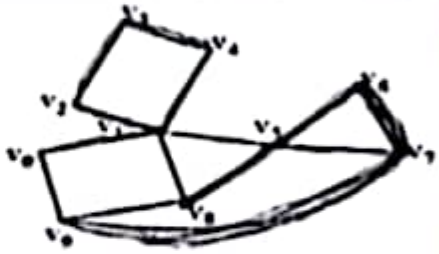
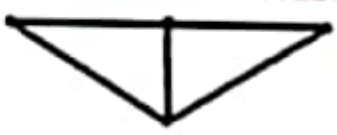
QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWAB

FINAL SEMESTER REGULAR EXAMINATION OF FIRST SEMESTER – SECOND YEAR 2022 OF 20 BATCH B.E

SUBJECT: DISCRETE STRUCTURES

Dated: 06.06.2022 Maximum Marks: 60 Time Allowed: 3 I

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

Q. No.		QUESTION	CLOs	M
Q. 01	(a)	Compute each of the following: (i) $\frac{7!}{5!}$ (ii) $\frac{(n-1)!}{(n+1)!}$	C2	
	(b)	An examination paper consists of 5 questions in section A and 5 questions in section B. A total of 8 questions must be answered. In how many ways can a student select the questions if he is to answer at least 4 questions from section A.	C2	
	(c)	Define the following: (i) Least common multiple (ii) Greatest common divisor	C2	
Q. 02	(a)	Suppose that a connected planar simple graph has 30 edges. If a plane drawing of this graph has 20 faces, how many vertices does this graph have?	C2	
	(b)	Find all non-isomorphic simple connected graphs with three vertices. ?	C2	
	(c)	Define Graphs and explain types of graphs.	C2	
Q. 03	(a)	Define the following terms with examples (graphically). (i) Connectedness in graphs (ii) Planner graph (iii) Complete Graph (iv) Spanning trees	C3	
	(b)	Write all the conditions for defining isomorphism of two graphs, and check whether given graphs G and G' are isomorphic or not. 	C3	
Q. 04	(a)	Draw edge end point function of given graph. 	C3	
	(b)	Define (a) Euler Circuits (b) Euler Path, (c) Hamilton Circuit, (d) Hamilton path and check whether given graph is a, b, c, d, or none of these. 	C3	
5	(a)	How many non-isomorphic spanning trees does the following simple graph has? 	C3	
	(b)	Draw a rooted tree with at least 7 vertices, where the degree of each vertex does not exceed 2. Identify the root, the parent of each vertex, the children of each vertex, the internal vertices, and the leaves. Mention the name of graph obtained from above given conditions.	C3	

The End

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

MID-SEMESTER EXAMINATION OF FIRST SEMESTER – SECOND YEAR (3RD SEMESTER) 2022, 20 BATCH, B.E

SUBJECT: SOFTWARE REQUIREMENT ENGINEERING

Dated: 17.02.2022 Maximum Marks: 20 Time Allowed: 01

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

Q. 01 Draw the diagram of RE process and describe each activity of RE process.

Q. 02 Discuss types of non-functional requirements.

Q. 03 How requirements are measured; write the metrics for various non-functional requirements.

QUAID-E-AWAM UNIVERSITY OF ENGINEERING SCIENCE & TECHNOLOG
NAWABSHAH SINDH
MID-SEMSTER OF 3rd SEMSTER EXAMINATION 2022 OF 20SW-BATCH
SUBJECT: Database Management Systems

: 16-02-2022 Maximum Marks: 20 Time Allowe

: ATTEMP ANY TWO QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Marks

State the answers of the following: (10)

1. Define data and information.
2. define database management systems.
3. Enlist function of DBMS.
4. describe schema.
5. describe tuple.

Discuss advantages and disadvantages between traditional file processing system and database management system. And justify your answer that which one is better for the super store. (10)

Discuss three level architecture along with neat diagram which shows the levels along with schema, mapping and type of users involved at each level. Label proper every item in diagram. (10)

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

MID-SEMESTER EXAMINATION OF FIRST SEMESTER – SECOND YEAR (3RD SEMESTER), 20-BATCH, B.E (S

SUBJECT: DISCRETE STRUCTURES

Dated: 15.02.2022 Maximum Marks: 20 Time Allowed

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

Q. 01 (a) Use the Truth table to prove that the following are logically equivalent.

i. $\sim (p \vee (\sim p \wedge q)) \equiv \sim p \wedge \sim q$

ii. $p \vee q \equiv q \vee p$

(b) Suppose that $P(x)$ be the statement "$x = x^2$" If the domain consists of the integers, w are these truth values?

i. $P(0)$

ii. $P(-1)$

iii. $\exists x P(x)$

iv. $\forall x P(x)$

(c) Let p and q be the propositions

p : I bought a lottery ticket this week.

q : I won the million dollar jackpot.

Express each of these propositions as an English sentence.

i. $p \vee q$

ii. $\sim p \rightarrow \sim q$

iii. $\sim p \vee (p \wedge q)$

Q. 02 (a) i. There are four major auto routes from Nawabshah to Hyderabad and six from Hyderabad to Karachi. How many major auto routes are there from Nawabshah to Karachi via Hyderabad?

ii. How many license plates can be made using either three English letters followed b three digits, or four English letters followed by two digits?

(b) Suppose that p and q are statements so that $p \rightarrow q$ is false. Find the truth values of each o following:

i. $\sim p \rightarrow q$

ii. $p \vee q$

iii. $q \leftrightarrow p$

(c) Define Pigeonhole principal with Example.

Q. 03 (a) Distinguish between

1. Exclusive OR and Inclusive OR
2. Tautology and contradiction
3. Floor Function and ceiling Function

(b) Prove the following using Venn Diagrams:

(i) $(A \cap B)^c = A^c \cup B^c$

(ii) $A - B = A \cap B^c$

Construct circuits from inverters, AND gates, and OR gates to produce these outputs

a) $\overline{x + y}$

b) $\overline{(x + z)(y + z)}$

"Good Luck"