Summary in Graph

Exam Summary (GO Classes CS Test Series 2025 | DBMS Subject Wise Test)

Qs. Attempted:	**0** 0 + 0	**Correct Marks:**	**0** 0 + 0
Correct Attempts:	**0** 0 + 0	**Penalty Marks:**	**0** 0 + 0
Incorrect Attempts:	**0** 0 + 0	**Resultant Marks:**	**0** 0 + 0

Total Questions:	**30** 10 + 20
Total Marks:	**50** 10 + 40
Exam Duration:	**90 Minutes**
Time Taken:	**0 Minutes**

EXAM RESPONSE | EXAM STATS | FEEDBACK

Technical

Q #1 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Databases

Scores:

Team	Day	Opponent	Runs
Dragons	Sun	Swallows	4
Tigers	Sun	Bay Stars	9
Carp	Sun	NULL	NULL
Swallows	Sun	Dragons	7
Bay Stars	Sun	Tigers	2
Giants	Sun	NULL	NULL
Dragons	Mon	Carp	NULL
Tigers	Mon	NULL	NULL
Carp	Mon	Dragons	NULL
Swallows	Mon	Giants	0
Bay Stars	Mon	NULL	NULL
Giants	Mon	Swallows	5

Determine the result of:

```
SELECT COUNT(*), COUNT(Runs)
FROM Scores
WHERE Team = 'Carp'
```

Which of the following is in the result:

A. $(1, 0)$
B. $(2, 0)$
C. $(2, \text{NULL})$
D. $(0, 0)$

Your Answer: | Correct Answer: B | Not Attempted | Time taken: 00min 00sec | Discuss

Q #2 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Databases

The join operation can be defined as

A. a cartesian product of two relations followed by a selection
B. a cartesian product of two relations
C. a union of two relations followed by cartesian product of the two relations
D. a union of two relations

Your Answer: | Correct Answer: A | Not Attempted | Time taken: 00min 00sec | Discuss

Q #3 | Numerical Type | Award: 1 | Penalty: 0 | Databases

Suppose R is a relation with attributes A1, A2, ... , A6. How many superkeys R has, if the only keys are $\{\text{A1}, \text{A2}\}$ and $\{\text{A1}, \text{A3}\}$?

Your Answer: | Correct Answer: 24 | Not Attempted | Time taken: 00min 00sec | Discuss

Q #4 Multiple Select Type | Award: 1 | Penalty: 0 | Databases

Consider a relation $\mathrm{R(A, B)}$ that contains r tuples, and a relation $\mathrm{S(B, C)}$ that contains s tuples; assume $r > 0$ and $s > 0$. Make no assumptions about keys $\&$ assume that the domain of all attributes is integers.

Consider the following queries:

- $\mathrm{Q1: R} \cup \rho_{\mathrm{S(A,\ B)}}\mathrm{S}$
- $\mathrm{Q\ 2 : \pi_{A,\ C}(R \bowtie S)}$

For a relational algebra expression Q, Let $\mathrm{min(Q), max(Q)}$ be the minimum and the maximum number of tuples that could be in the result of the expression Q.

Which of the following is/are correct?

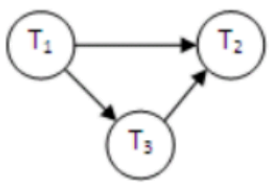
A. $\mathrm{min(Q1) = min(r, s); min(Q2) = 0}$
B. $\mathrm{min(Q1) = max(r, s); min(Q2) = 0}$
C. $\mathrm{max(Q1) = r + s; max(Q2) = rs}$
D. $\mathrm{max(Q1) = max(r, s); max(Q2) = rs}$

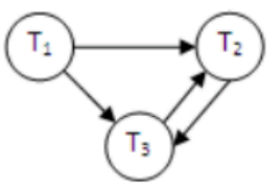
Your Answer: | **Correct Answer: B;C** | Not Attempted | Time taken: 00min 00sec | Discuss

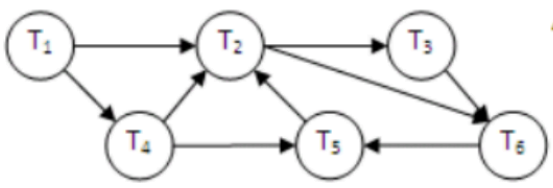
Q #5 Multiple Choice Type | Award: 1 | Penalty: 0.33 | Databases

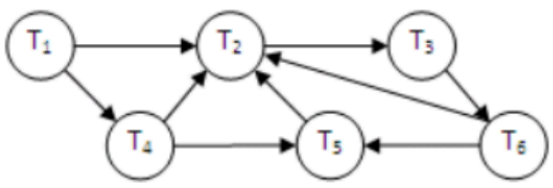
A simple way to detect a state of deadlock is to construct a wait-for graph. One node is created in the graph for each transaction that is currently executing in the schedule. Whenever a transaction T_i is waiting to lock an item X that is currently locked by a transaction T_j, it creates a directed edge $(\mathrm{T}_i \# \mathrm{T}_j)$. When T_j releases the lock(s) on the items that T_i was waiting for, the directed edge is dropped from the waiting-for graph.

Given the graph below, identify the deadlock situations.

1.


2.


3.


4.


Which of the above wait-for graph represents a deadlock situation?

A. Only $3, 4$
B. Only 1
C. Only $2, 3, 4$
D. ALL

Your Answer: | **Correct Answer: C** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #6 Multiple Select Type | Award: 1 | Penalty: 0 | Databases

Consider the relational schema $\mathrm{(A, B, C)}$ with Functional Dependencies set $\mathrm{F = \{A \rightarrow B, B \rightarrow AC, C \rightarrow B\}}$;

Which of the following Functional Dependencies set is equivalent to F?

A. $\{A \rightarrow B, B \rightarrow C, C \rightarrow A\}$
B. $\{A \rightarrow C, B \rightarrow A, C \rightarrow B\}$
C. $\{A \rightarrow BC, B \rightarrow A, C \rightarrow A\}$
D. $\{A \rightarrow C, B \rightarrow C, C \rightarrow AB\}$

Your Answer: | Correct Answer: A;B;C;D | Not Attempted | Time taken: 00min 00sec | Discuss

Q #7 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Databases

Consider the schedule

$$S = \{R_1(A), R_2(B), W_2(A), W_1(A)\}$$

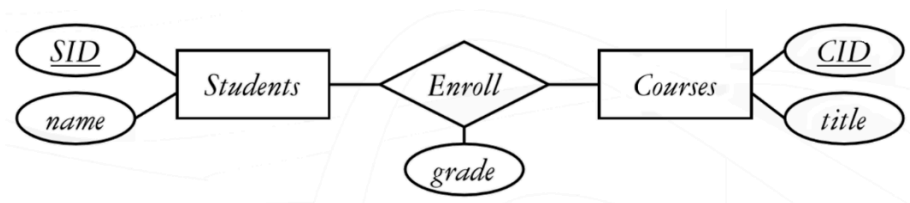
Assume that transaction T_1 has started execution before the Transaction T_2 then the schedule is

A. Allowed under Basic timestamp protocol but not under Thomas write rule
B. Not allowed under Basic timestamp protocol but allowed under Thomas write rule
C. Allowed under both Basic timestamp protocol and Thomas write rule
D. Not allowed under both Basic timestamp protocol and Thomas write rule

Your Answer: | Correct Answer: B | Not Attempted | Time taken: 00min 00sec | Discuss

Q #8 | Multiple Select Type | Award: 1 | Penalty: 0 | Databases

Given the E/R diagram below



Which of the following relations appear in the relational model representation of the diagram?

A.
```
Courses(CID, title)
```

B.
```
Students(SID, name)
```

C.
```
Students(SID, name, CID)
```

D.
```
Enroll(SID, CID, grade)
```

Your Answer: | Correct Answer: A;B;D | Not Attempted | Time taken: 00min 00sec | Discuss

Q #9 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Databases

Codd's rule of physical data independence is that

A. all information in the database is to be represented in one and only one way, namely by values in column positions within rows of tables.
B. all views that are theoretically updatable must be updatable by the system.
C. changes that are made to the physical storage representations or access methods must not require changes be made to application programs.
D. changes that are made to tables that do not modify any of the data already stored in the tables must not require changes be made to application programs.

Your Answer: | Correct Answer: C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #10 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | Databases

Let $\mathrm{R}_1, \mathrm{R}_2, \ldots, \mathrm{R}_n$ be a decomposition of schema U. Let $u(\mathrm{U})$ be a relation, and let $r_i = \prod_{R_\mathrm{I}}(u)$. Which of the following is true?

A. $u \subseteq r_1 \bowtie r_2 \bowtie \cdots \bowtie r_n$
B. $u = r_1 \bowtie r_2 \bowtie \cdots \bowtie r_n$
C. $u \supseteq r_1 \bowtie r_2 \bowtie \cdots \bowtie r_n$
D. $u \neq r_1 \bowtie r_2 \bowtie \cdots \bowtie r_n$

Your Answer: | Correct Answer: A | Not Attempted | Time taken: 00min 00sec | Discuss

Q #11 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Databases

Given a database relation schema $\mathrm{R}(\mathrm{A1},\ \mathrm{A2}, \ldots, \mathrm{A}n)$ and a set of functional dependencies F which hold true on R. Consider the following algorithm :

$\mathrm{Step}\ 1:$
Construct a list L consisting of all non-empty subsets of $\{\mathrm{A1}, \ldots, \mathrm{A}n\}$ (there are $2^n - 1$ of them). These subsets are arranged in L in ascending order of the size of the subset: We get $\mathrm{L} = \langle \mathrm{Z1}, \mathrm{Z2}, \ldots, \mathrm{Z}m \rangle$, where $\mathrm{m} = 2^n - 1$, such that $|Zi| \leq |Z(i+1)|$.
Here $|\mathrm{Zi}|$ denotes the number of elements in the set Zi.

$\mathrm{Step}\ 2:$
Initialize the set $\mathrm{K} = \{\}$.
While L is not empty:
remove the first element Zi from L, and compute Zi^+. (Where X^+ denotes closure of X)
If $\mathrm{Zi}^+ = \mathrm{R}$, then

a. Add $\mathrm{Z}i$ to K
b. Remove any element Zj from L if $\mathrm{Zi} \subset \mathrm{Zj}$.

$\mathrm{Step}\ 3:$
Output K as the final result.

What is K?

A. Set of all super keys
B. Set of all candidate keys
C. Set of all non-candidate keys
D. Set of all super keys which are not candidate keys

Your Answer: | Correct Answer: B | Not Attempted | Time taken: 00min 00sec | Discuss

Q #12 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Databases

Consider a schema with two relations, $\mathrm{R}(\ \mathrm{A},\ \mathrm{B})$ and $\mathrm{S}(\ \mathrm{B}, \mathrm{C})$, where all values are integers. Make no assumptions about keys. Consider the following three relational algebra expressions:

a. $\pi_{\mathrm{A},\,\mathrm{C}}\ (\mathrm{R} \bowtie \sigma_{\mathrm{B}=1}\mathrm{S})$
b. $\pi_{\mathrm{A}}\ (\sigma_{\mathrm{B}=1}\mathrm{R}) \times \pi_{\mathrm{C}}\ (\sigma_{\mathrm{B}=1}\mathrm{S})$
c. $\pi_{\mathrm{A},\,\mathrm{C}}\ (\pi_{\mathrm{A}}\mathrm{R} \times \sigma_{\mathrm{B}=1}\mathrm{S})$

Which of the two of the three expressions are equivalent (i.e., produce the same answer on all databases), while one of them can produce a different answer?

A. a, b
B. a,c
C. b, c
D. None of the above

Your Answer: | **Correct Answer: A** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #13 Numerical Type | Award: 2 | Penalty: 0 | Databases

Consider the following database relations :
Enrolled(Student, Course): It contains the courses that each student has enrolled into, and
ToDo(Course): It contains the courses that are required to graduate.
The instance for Enrolled relation is shown below:

Student	Course
Robert	Databases
Robert	Programming Languages
Susie	Databases
Susie	Operating Systems
Julie	Programming Languages
Julie	Machine Learning
Emilie	Operating Systems

The instance for ToDo relation is shown below:

Course
Databases
Programming Languages

We run the following SQL Query of this database :

```
SELECT Student FROM Enrolled
EXCEPT
SELECT Student FROM (
                    SELECT Student, Course
                    FROM (select Student FROM Enrolled), ToDo
                    EXCEPT
                    SELECT Student, Course FROM Enrolled);
```

How many tuples will be there in the output of this SQL Query?

Your Answer: | **Correct Answer: 1** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #14 Multiple Choice Type | Award: 2 | Penalty: 0.67 | Databases

Consider the following set of relations:

$\mathrm{EMP}(\underline{\text{eno}}, \text{ename}, \text{dno})$
$\mathrm{DEPT}(\underline{\text{dno}}, \text{dname})$

Primary key columns are underlined and dno in EMP is a foreign key referring primary key of DEPT table.
Now consider the following queries:

QUERY : 1

```
SELECT *
FROM emp e, dept d
WHERE e.dno = d.dno;
```

QUERY : 2

```
SELECT *
FROM emp NATURAL JOIN dept;
```

Then which of the following statements are TRUE regarding the above queries?

I. Both Query : 1 and Query : 2 returns same no of rows.
II. Both Query : 1 and Query : 2 returns same no of columns.
III. Both Query : 1 and Query : 2 returns different no of rows.
IV. Both Query : 1 and Query : 2 returns different no of columns.

A. I, II only
B. I, IV only
C. II, III only
D. III, IV only

Your Answer: | Correct Answer: B | Not Attempted | Time taken: 00min 00sec | Discuss

Q #15 | Multiple Select Type | Award: 2 | Penalty: 0 | Databases

Assume we have two relations $\mathrm{R}(\mathrm{A}, \mathrm{B})$ and $\mathrm{S}(\mathrm{B}, \mathrm{C})$. All three attributes $(\mathrm{A}, \mathrm{B}, \mathrm{C})$ are integer attributes. Assume that Relation R contains the following tuples: $(1,2),(2,3)$, and $(3,4)$. Assume that relation S contains the following tuples $(2,2),(2,3)$, and $(5,1)$. Note that " $\times$ " is Natural join, in following expressions.

Which of the following relational algebra expressions are equivalent, with respect to above information?

A. $\pi_{\mathrm{A}}\left(\sigma_{\mathrm{B}=1}(\mathrm{R})\right)$ and $\sigma_{\mathrm{B}=1}\left(\pi_{\mathrm{A}}(\mathrm{R})\right)$
B. $\pi_{\mathrm{A}}\left(\sigma_{\mathrm{A}=1}(\mathrm{R})\right)$ and $\sigma_{\mathrm{A}=1}\left(\pi_{\mathrm{A}}(\mathrm{R})\right)$
C. $\pi_{\mathrm{A}, \mathrm{B}}(\mathrm{R} \times \mathrm{S})$ and $\left(\pi_{\mathrm{A}, \mathrm{B}}(\mathrm{R})\right) \times \mathrm{S}$
D. $\sigma_{\mathrm{B}=1}(\mathrm{R} \times \mathrm{S})$ and $\left(\sigma_{\mathrm{B}=1}(\mathrm{R})\right) \times \mathrm{S}$

Your Answer: | Correct Answer: B;D | Not Attempted | Time taken: 00min 00sec | Discuss

Q #16 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | Databases

Consider the relations $\mathbf{R}(\underline{\mathrm{A}}, \mathrm{B}^*)$ and $\mathbf{S}(\mathrm{A}^*, \underline{\mathrm{B}})$, where $\mathbf{R}$ has a foreign key referencing $\mathbf{S}$ via B, and $\mathbf{S}$ has a foreign key referencing $\mathbf{R}$ via A.
Which of the following is guaranteed to produce fewer than, or at most the same, number of tuples as any of the others?

A. $\mathbf{R} \bowtie \mathbf{S}$
B. $\mathbf{R} \cup \mathbf{S}$
C. $\mathbf{R} \bowtie \pi_{\mathrm{B}}(\mathbf{S})$
D. $\pi_{\mathrm{A}}(\mathbf{R}) \bowtie \mathbf{S}$

Your Answer: | Correct Answer: A | Not Attempted | Time taken: 00min 00sec | Discuss

Q #17

Numerical Type | Award: 2 | Penalty: 0 | Databases

A B-Tree of order m is an m-way search tree in which every node, except root node, has at least $m/2$ children. The height of a one-level tree is defined to be 0, the height of a tree with two levels is defined to be 1, and so on. What is the minimum number of distinct keys (or records) stored in a B Tree of height 5 and order 5?

Your Answer: | Correct Answer: 485 | Not Attempted | Time taken: 00min 00sec | Discuss

Q #18

Multiple Select Type | Award: 2 | Penalty: 0 | Databases

Two more exotic relational algebra operators are the semijoin $(\ltimes)$ and antijoin $(\triangleright)$. Semijoin is the same as natural join, except only attributes of the first relation are returned in the result. For example, if we have relations Student(ID, name) and Enrolled(ID, course), and not all students are enrolled in courses, then the query "Student $\ltimes$ Enrolled" returns the ID and name of all students who are enrolled in at least one course. In the general case, $\mathrm{E}_1 \ltimes \mathrm{E}_2$ returns all tuples in the result of expression E_1 such that there is at least one tuple in the result of E_2 with matching values for the shared attributes. antijoin is the converse: $\mathrm{E}_1 \triangleright \mathrm{E}_2$ returns all tuples in the result of expression E_1 such that there are no tuples in the result of E_2 with matching values for the shared attributes. For example, the query "Student $\triangleright$ Enrolled" returns the ID and name of all students who are not enrolled in any courses.

Which of the following is/are True?

A. $\mathrm{E}_1 \ltimes \mathrm{E}_2 = \pi_{\mathrm{schema}(\mathrm{E}_1)} (\mathrm{E}_1 \bowtie \mathrm{E}_2)$

B. $\mathrm{E}_1 \triangleright \mathrm{E}_2 = \mathrm{E}_1 - \pi_{\mathrm{schema}(\mathrm{E}_1)} (\mathrm{E}_1 \bowtie \mathrm{E}_2)$

C. $(\mathrm{E}_1 \triangleright \mathrm{E}_2) \cup (\mathrm{E}_1 \ltimes \mathrm{E}_2) = \mathrm{E}_1$

D. $(\mathrm{E}_1 \triangleright \mathrm{E}_2) \bowtie (\mathrm{E}_1 \ltimes \mathrm{E}_2) = \mathrm{E}_1$

Your Answer: | Correct Answer: A;B;C | Not Attempted | Time taken: 00min 00sec | Discuss

Q #19

Numerical Type | Award: 2 | Penalty: 0 | Databases

B^+-trees have different structures for leaf and non-leaf nodes. In B^+- tree leaf node contains keys and record pointer associated with it and a block pointer pointing to the next leaf node. Non-leaf nodes contains only keys and child pointer, there is no need to store record pointer at non-leaf node, because all keys are ultimately present on leaf node. For leaf node order will be maximum number of keys, record pointer pair a node can hold, but order of non leaf node is determined by maximum child pointers it can have. A B^+-tree index is to be built on the Name attribute of the relation STUDENT. Assume that all student names are of length 8 bytes, disk blocks are of size 512 bytes, and index pointers, record pointers are of size 4 bytes, 5 bytes respectively. Given this scenario, the best choice for the order of leaf node and non-leaf node is X, Y respectively. Then what is $\mathrm{Y} - \mathrm{X}$?

Your Answer: | Correct Answer: 4 | Not Attempted | Time taken: 00min 00sec | Discuss

Q #20

Multiple Select Type | Award: 2 | Penalty: 0 | Databases

Which of the following are true in relational algebra :

A. For any database relation R and predicates p, q, we have

$$\sigma_{p \wedge q}(\mathrm{R}) = \sigma_p\left(\sigma_q(\mathrm{R})\right)$$

B. selection is commutative, that is,

$$\sigma_p\left(\sigma_q(\mathrm{R})\right) = \sigma_q\left(\sigma_p(\mathrm{R})\right)$$

C. For any subsets a and b of a database relation R such that $\mathrm{a} \subseteq b$, we have

$$\pi_a(\mathrm{R}) = \pi_a\left(\pi_b(\mathrm{R})\right)$$

D. For any subset "a" of the attributes of a database relation R, and any predicate p only on "a", we have

$$\pi_a\left(\sigma_p(\mathrm{R})\right) = \sigma_p\left(\pi_a(\mathrm{R})\right)$$

Your Answer: | **Correct Answer: A;B;C;D** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #21 Numerical Type | Award: 2 | Penalty: 0 | Databases

Consider the following example query over the relations M(P,Q) and N(P, R) :

```
SELECT N.P FROM N
WHERE N.R = (SELECT COUNT(M.Q)
             FROM M
             WHERE M.P=N.P);
```

For the following instances of relations M, N, what will be the number of tuples in the output of the given SQL query?

M

P	Q
1	2
1	3
2	2
2	5
3	4

N

P	R
5	0
0	5
0	0
1	3
2	3
3	1

Your Answer: | **Correct Answer: 3** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #22 Multiple Choice Type | Award: 2 | Penalty: 0.67 | Databases

Consider a schema with two relations, $\mathrm{R}(\mathrm{A}, \mathrm{B})$ and $\mathrm{S}(\mathrm{B}, \mathrm{C})$, where all values are integers. Make no assumptions about keys. Consider the following three relational algebra expressions:

a. $\pi_{\mathrm{A},\,\mathrm{C}}\left(\mathrm{R} \bowtie \sigma_{\mathrm{B}=1}\mathrm{S}\right)$
b. $\pi_{\mathrm{A}}\left(\sigma_{\mathrm{B}=1}\mathrm{R}\right) \times \pi_{\mathrm{C}}\left(\sigma_{\mathrm{B}=1}\mathrm{S}\right)$
c. $\pi_{\mathrm{A},\,\mathrm{C}}\left(\pi_{\mathrm{A}}\mathrm{R} \times \sigma_{\mathrm{B}=1}\mathrm{S}\right)$

Which of the three expressions are equivalent (i.e., produce the same answer on all databases)?

A. Only a, b
B. Only a, c
C. Only b, c
D. None

Your Answer: | Correct Answer: A | Not Attempted | Time taken: 00min 00sec | Discuss

Q #23 Numerical Type | Award: 2 | Penalty: 0 | Databases

Consider a relation $\mathrm{R(A, B)}$ that contains 100 tuples, and a relation $\mathrm{S(B, C)}$ that contains 80 tuples; Make no assumptions about keys & assume that the domain of all attributes is integers. Consider the following relational algebra expression:

$$\pi_{\mathrm{B}}\mathrm{R} - (\pi_{\mathrm{B}}\mathrm{R} - \pi_{\mathrm{B}}\mathrm{S})$$

Let m be the minimum and M be the maximum number of tuples that could be in the result of the above expression, then $m + \mathrm{M}$?

Your Answer: | Correct Answer: 80 | Not Attempted | Time taken: 00min 00sec | Discuss

Q #24 Multiple Select Type | Award: 2 | Penalty: 0 | Databases

Consider the following concurrent execution of three transactions $\mathrm{T_1, T_2, T_3}$:

$\mathrm{T_1}$	$\mathrm{T_2}$	$\mathrm{T_3}$
		$\mathrm{r(Z)}$
$\mathrm{w(X)}$		
	$\mathrm{r(Y)}$	
		$\mathrm{w(Z)}$
$\mathrm{w(Y)}$		
	$\mathrm{r(Z)}$	
	commit	
		commit
commit		

- $\mathrm{w(P)}$ means Write operation on "P"
- $\mathrm{r(P)}$ means Read operation on "P"

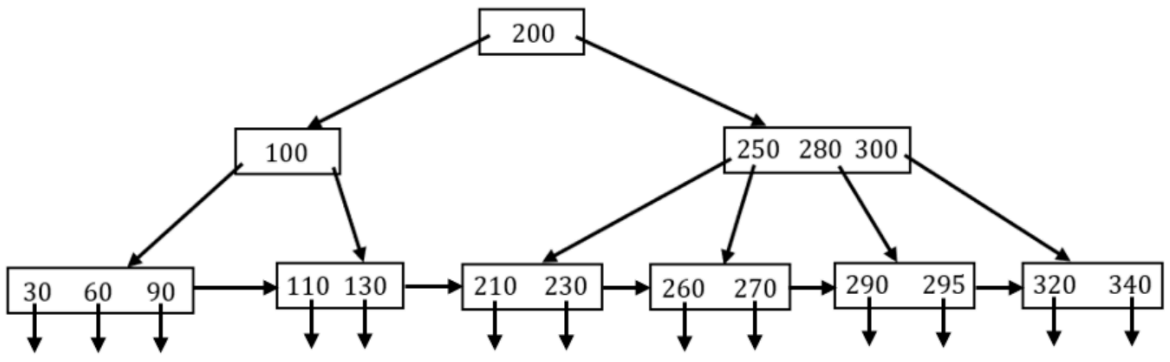
Which of the following is/are False about the given schedule?

A. It is conflict serializable.
B. It is view serializable.
C. It can be produced by a Two-Phase Lock $(\mathrm{2PL})$ scheduler.
D. It can be produced by a strict $\mathrm{2PL}$ scheduler.

Your Answer: | Correct Answer: D | Not Attempted | Time taken: 00min 00sec | Discuss

Q #25 Multiple Select Type | Award: 2 | Penalty: 0 | Databases

Consider the following $\mathrm{B^+}$ tree.



We want to find out the minimum number of disk IOs required to retrieve the record pointers (not including the disk IOs to read the actual records). We assume we need to follow the sequence pointers of the leaf nodes to traverse the leaf nodes (if necessary).
Which of the following is/are correct?

A. To Find records with the key values in the range 50 to 80 inclusive : 3 disk IO
B. To Find records with the key values in the range 40 to 90 inclusive : 4 Disk IO
C. Find records with the key values in the range 40 to 110 inclusive : 4 Disk IO
D. Find records with the key values in the range 210 to 295 inclusive : 6 Disk IO

Your Answer: | **Correct Answer: A;C** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #26 Numerical Type | Award: 2 | Penalty: 0 | Databases

A B^{+} Tree of order M has the following properties:

1. The root is either a leaf or has between 2 and M children.
2. All non-leaf nodes (except the root) have between $\lceil \mathrm{M}/2 \rceil$ and M children.
3. All leaves are at the same depth.

All data records are stored at the leaves.

Internal nodes have "keys" guiding to the leaves.

Leaves store between $\lceil \mathrm{L}/2 \rceil$ and L data records, where L can be equal to M or can be different.

The number of levels in the tree is also called the height i.e. a B^{+} tree with a single node has height 1.
In a B^{+} tree with $\mathrm{M} = 4,\ \mathrm{L} = 3$, and height $h = 30$, the worst(maximum) number of comparisons required to find a key is _____ (Assume that, within a node we search using Linear Search, Not using Binary Search)

Your Answer: | **Correct Answer: 90** | Not Attempted | Time taken: 00min 03sec | Discuss

Q #27 Numerical Type | Award: 2 | Penalty: 0 | Databases

In the context of relational database model and relational algebra, Let A, B be two relation schemes.

For any relation instances $a(\mathrm{A}), b(\mathrm{B})$; We say that a relation instance Y is the Yield of a, b if Y is the largest relation instance such that $\mathrm{Y} \times b \subseteq a$ (Note that " $\times$ " is the cross product).

Consider the following relation instances r, s :

r

A	B	C	D	E
α	a	α	a	1
α	a	γ	a	1
α	a	γ	b	1
β	a	γ	a	1
β	a	γ	b	3
γ	a	γ	a	1
γ	a	γ	b	1
γ	a	β	b	1

s

D	E
a	1
b	1

The number of tuples in the Yield of r, s is _____

Your Answer: | **Correct Answer: 2** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #28 Multiple Select Type | Award: 2 | Penalty: 0 | Databases

In a relational database relation, we say a non-empty set of attributes X is closed (with respect to a given set of functional dependencies FD) if $\mathrm{X}^{+} = \mathrm{X}$. Consider a relation with schema $\mathrm{R}(\mathrm{A}, \mathrm{B}, \mathrm{C}, \mathrm{D})$ and an unknown set of FD's. If we are told which sets of attributes are closed, we can discover the FD's.

Assume that the only closed sets are $\{\mathrm{A}, \mathrm{B}\}$, and $\{\mathrm{A}, \mathrm{B}, \mathrm{C}, \mathrm{D}\}$.

Which of the following is/are true for R?

A. The number of candidate keys is 2.
B. The number of non-prime attributes is 1.
C. The number of non-trivial FDs of the form $\mathrm{X} \rightarrow \mathrm{Y}$ where X, Y both are single attributes, is 12.
D. The number of non-trivial FDs of the form $\mathrm{X} \rightarrow \mathrm{Y}$ where X, Y both are single attributes, is 8.

Your Answer: | **Correct Answer: A;D** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #29 Numerical Type | Award: 2 | Penalty: 0 | Databases

Consider the following Student database and the relations in it :

```
Student (sid, name, marks)
Course (cid, min, max)
```

Student relation has the following set of tuples :

```
{ ( 101, a, 50  ), (102, b, 52), (103, c, 60), (104, d, 70) }
```

Course relation has the following set of tuples :

```
{ (c1, 20, 90), (c2, 15, 95), (c3, 10, 100) }
```

Consider the following query :

```
SELECT S.sid
FROM Student S
WHERE EXISTS ( SELECT COUNT(*)
        FROM Course C
5.      WHERE S.marks > C.min AND S.marks >  C.max)
```

How many tuples will be in the output of the above SQL Query?

Your Answer: | **Correct Answer: 4** | Not Attempted | Time taken: 00min 00sec | Discuss

Q #30 Multiple Select Type | Award: 2 | Penalty: 0 | Databases

Let $\mathrm{R}(a, b, c, d)$ be a RDBMS relation having the following set of functional dependencies (FD set) :

FD Set $\mathrm{F} = \{b \rightarrow c; c \rightarrow d; ab \rightarrow d; bc \rightarrow cd\}$

We apply some queries on a relational instance r of R. Which of the following queries are guaranteed to return the same number of tuples as in relation instance r?

A. $\prod_{a}(r)$
B. $\prod_{a,c}(r)$
C. $\prod_{a,b}(r)$
D. $\prod_{a,b,d}(r)$

Your Answer: | **Correct Answer: C;D** | Not Attempted | Time taken: 00min 00sec | Discuss

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