

LVL2 SET A TEST 2 PROGRAMMING

Hitbullseye

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Question No: 1

DIRECTIONS for the question: Mark the best option:

Let a largest n bit binary number requires 'm' digits in digital representation, then which of the following relation is approximately correct?

- m = 2n
- n = 2m
- $m < n \log_{10}^2$
- $m > n \log_{10}^2$

Explanation

Correct answer is: D

Question No: 2

DIRECTIONS for the question: Mark the best option:

The method of network routing where every possible path between transmitting and receiving DTE is used is called

random routing

packet flooding

directory routing

message switching

Explanation

Correct answer is: B

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Question No: 3

DIRECTIONS for the question: Mark the best option:

Which of the following statements are TRUE about an SQL query?

P : An SQL query can contain a HAVING clause even if it does not have a GROUP BY clause

Q : An SQL query can contain a HAVING clause only if it has a GROUP BY clause

R : All attributes used in the GROUP BY clause must appear in the SELECT clause

S : Not all attributes used in the GROUP BY clause need to appear in the SELECT clause

P and R

P and S

Q and R

Q and S

Explanation HAVING clause exists only in the context of a GROUP BY clause. It filters the rows that were grouped by the GROUP BY clause. So, statement P is false and statement Q is true.

If you have a GROUP BY clause, what can be included in the SELECT clause are

- Zero or more of the attributes used in the GROUP BY clause
- Any user-defined or built-in function (Example: max, min, average) that returns a single value for each group.

So, statement R is false and statement S is true.

Correct answer is: D

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Question No: 4

DIRECTIONS for the question: Mark the best option:

Match the following:

1. Data link layer	(i) the lowest layer whose function is to activate, deactivate and maintain the circuit between DTE and, DCE
2. Physical layer	(ii) performs routing and communication
3. Presentation layer	(iii) detection and recovery from errors in the transmitted data
4. Network layer	(iv) Provides for the syntax of the data

I-(iii), 2-(i), 3-(iv), 4—(ii)

I-(ii), 2-(i), 3-(iv), 4-(iii)

I-(iv), 2-(i), 3—(ii), 4-(iii)

I-(ii), 2-(i), 3-(iii), 4-(iv)

Explanation

Correct answer is: A

Question No: 5

DIRECTIONS for the question: Mark the best option:

Consider the following transactions with data items P and Q initialized to zero:

T₁: read (P);
read (Q);
if P = 0 then Q := Q + 1 ;

```

write (Q).
T2: read (Q) ;
read (P) ;
if Q = 0 then P := P +1;
write (P).

```

Any non-serial interleaving of T₁, and T₂ for concurrent execution leads to

a serializable schedule

a schedule that is not conflict serializable

a conflict serializable schedule

A schedule for which a precedence graph cannot be drawn

Explanation A transaction is a collection of actions (that are usually read, write, commit, abort). A schedule is an ordered collection of actions from different transactions. r₁(X) denotes transaction 1 reading the value variable X. w₂(Y) denotes transaction 2 writing (changing the value of) variable Y. Two or more actions in a schedule are said to be in conflict if they access the same variable, they belong to different transactions, and at least one of them is a write. In schedule S₁, the actions r₁(Y) and w₂(Y) are in conflict (they are two different transactions, they access the same variable Y, and one of the actions is a write). In schedule S₂, the actions w₁(X) and r₂(X) are in conflict (they are two different transactions, they access the same variable X, and one of the actions is a write). Thus both the given schedules have conflicting actions.

To find if a schedule is conflict serializable, draw the precedence graph. If the graph has no cycles then the schedule is conflict serializable. In a precedence graph, the nodes are transactions. A directed edge is defined between a node T₁ to node T₂ if (and only if) there is an action in T₁ that is in conflict with an action in T₂ and, in the schedule's listing of ordered actions, this action in T₁, precedes the action T₂. Find below the precedence graph for schedule S₁.

Note: The presence of the conflicting actions r₁(Y) and w₂(Y), and, the occurrence of r₁(Y) before w₂(Y) resulted in the directed edge from T₁, to T₂. The presence of the conflicting actions r₂(X) and w₁(X), and, the occurrence of r₂(X) before w₁(X) resulted in the directed edge from T₂ to T₁. The presence of a cycle indicates that schedule S₁, is not conflict serializable. Find below the precedence graph for schedule S₂.

Note: The presence of the conflicting actions $r_2(X)$ and $w_1(X)$, and, the occurrence of $r_2(X)$ before $w_1(X)$ resulted in the directed edge from T_2 to T_1 . No edge could be defined from T_1 to T_2 .
The absence of a cycle indicates that schedule S_2 is conflict serializable.

Correct answer is: B

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Question No: 6

DIRECTIONS for the question: Mark the best option:

Following algorithm (s) can be used to sort n integers in the range [1... n^3] in $O(n)$ time?

Heap sort

Quick sort

Merge sort

Radix sort

Explanation Radix sort is a non-comparative integer sorting algorithm that sorts data with integer keys by grouping keys which share same position and value. So it take $O(n)$ time.

Correct answer is: D

Question No: 7

DIRECTIONS for the question: Mark the best option:

The Floyd-Warshall algorithm for all-pair shortest paths computation is based on

Greedy paradigm

Divide-and-conquer paradigm

Dynamic Programming paradigm

Neither Greedy nor Divide-and-Conquer nor Dynamic Programming paradigm.

Explanation Floyd Warshall algorithm for all pair shortest paths computation is based on dynamic programming paradigm.

Correct answer is: C

Question No: 8

DIRECTIONS for the question: Mark the best option:

Which one of the following algorithm design techniques is used in finding all pairs of shortest distances in a graph?

Dynamic programming

Backtracking

Greedy

Divide and Conquer

Explanation Bellman-Ford algorithm is used to find all pairs shortest distances in a graph and it is dynamic programming technique.

Correct answer is: A

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Question No: 9

DIRECTIONS for the question: Mark the best option:

A CPU generally handles an interrupt by executing an interrupt service routine

As soon as an interrupt is raised

By checking the interrupt register at the end of fetch cycle.

By checking the interrupt register after finishing the execution of the current instruction.

By checking the interrupt register at fixed time intervals.

Explanation Hardware detects interrupt immediately, but CPU acts only after its current instruction. This is followed to ensure integrity of instructions.

Correct answer is: C

Question No: 10

DIRECTIONS for the question: Mark the best option:

Which of the following is true when describing any cast address?

Packets addressed to a unicast address are delivered to a single interface.

Packets are delivered to all interfaces identified by the address. This is also called one-to-many addresses.

This address identifies multiple interfaces and the anycast packet is only delivered to one address. This address can also be called one-to-one-of-many.

These addresses are meant for non-routing purposes, but they are almost globally unique so it is unlikely they will have an address overlap.

Explanation

Correct answer is: C

Question No: 11

DIRECTIONS for the question: Mark the best option:

The DoD model (also called the TCP/IP stack) has four layers. Which layer of the DoD model is equivalent to the Network layer of the OSI model?

Application

Host-to-Host

Internet

Network Access

Explanation

Correct answer is: C

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Question No: 12

DIRECTIONS for the question: Mark the best option:

Which of the following is not correct about a View

To protect some of the columns of a table from other users

Occupies data storage space

To hide complexity of a query

To hide complexity of a calculations

Explanation

Correct answer is: B

Question No: 13

DIRECTIONS for the question: Mark the best option:

The SQL statement

`SELECT TRUNC(45.926, -1) FROM DUAL;`

is illegal

5

prints 45.9

prints 40

Explanation `TRUNC(45.926,-1)` truncates 1 decimal place to the left of the decimal point (left because of the - sign). The 45 will be made 40.

Correct answer is: D

Question No: 14

DIRECTIONS for the question: Mark the best option:

Assume transaction A holds a shared lock R. If transaction B also requests for a shared lock on R, it will

result in a deadlock situation

immediately be granted

immediately be rejected

be granted as soon as it is released by A

Explanation

Correct answer is: B

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Question No: 15

DIRECTIONS for the question: Mark the best option:

Which of the following statements is true?

- I. As the number of entries in a hash table increases, the number of collisions increases.

- II. Recursive programs are efficient
- III. The worst case complexity for Quicksort is $O(n^2)$
- IV. Binary search using a linear linked list is inefficient.

I and II

II and III

I and IV

I and III

Explanation I. In hashing, as the number of entries in a hash table increases, the number of collisions increases.
II. It is not always true that recursive programs are efficient.
III. Quicksort is a comparison sort which in worst case makes $O(n^2)$ comparisons.
IV. Binary search can be used with linked list, however, it is inefficient.
So option (d) is correct.

Correct answer is: D

Question No: 16

DIRECTIONS for the question: Mark the best option:

After running a test that contains both input and output parameters, where can the results of an output parameter be found

local data sheet

global data sheet

run-time data table

design-time data table

Explanation

Correct answer is: C

Question No: 17

DIRECTIONS for the question: Mark the best option:

If a relation scheme is in BCNF, then it is also in

first normal form

Second normal form

third normal form

All of the above

Explanation

Correct answer is: B

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Question No: 18

DIRECTIONS for the question: Mark the best option:

Consider the following rooted tree with the vertex P labeled as root

The order in which the nodes are visited during in-order traversal is

SQPTRWUV

SQPTURWV

SQPTWUVR

SQPTRUWV

Explanation The only confusion in this question is, there are 3 children of R. So when should R appear – after U or after R? There are two possibilities: SQPTRWUV and SQPTWURV. Only 1st possibility is present as an option A, the 2nd possibility is not there. Therefore option A is the right answer.

Correct answer is: A

Question No: 19

DIRECTIONS for the question: Mark the best option:

You have an interface on a router with the IP address of 192.168.192.10/29. What is the broadcast address the hosts will use on this LAN?

192.168.192.15

192.168.192.31

192.168.192.63

192.168.192.127

Explanation

Correct answer is: A

Question No: 20

DIRECTIONS for the question: Mark the best option:

Which of the following query transformation (i.e, replacing the L.H.S. expression by the R H S expression) is incorrect? R and R^1 are relations, C and C^1 are selection conditions and A and A^1 are attributes of R^1

Explanation

Correct answer is: C

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Question No: 21

DIRECTIONS for the question: Mark the best option:

The worst case running times of insertion sort, Merge sort and Quick sort, respectively, are:

($n \log n$), ($n \log n$), and (n^2)

(n^2), (n^2), and ($n \log n$)

(n^2), ($n \log n$), and ($n \log n$)

(n^2), ($n \log n$), and (n^2)

Explanation The worst case time complexity of algo given are:

Insertion sort = (n^2)

Merge sort = $(n \log n)$

Quick sort = (n^2)

Correct answer is: D

Question No: 22

DIRECTIONS for the question: Mark the best option:

In the $m*m$ multiplication process using carry save addition, if bit pair recording of the multiplier is done then levels of carry save addition will reduce from _____

1.7 $\log_2 m$ to 0

-1.7 $\log_2 m$ to -3.4 $\log_2 m$

1.7 $\log_2 m$ to -3.4 $\log_2 m$

1.7 $\log_2(m-1.7)$ to 1.7 $\log_2(m-3.4)$

Explanation

Correct answer is: D

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Question No: 23

DIRECTIONS for the question: Mark the best option:

There are n stations in a slotted LAN. Each station attempts to transmit with a probability p in each time slot. What is the probability that ONLY one station transmits in a given time slot?

$$np(1-p)^{n-1}$$

$$(1-p)^{n-1}$$

$$P(1-p)^{n-1}$$

$$1 - (1-p)^{n-1}$$

Explanation The probability that a particular station transmits in a given time slot is p . The probability that a particular station does not transmit in a given time slot is $1-p$. The probability that one particular station transmits and all the other stations don't transmit, in a given time slot, is, $p(1-p)^{n-1}$. The one station that transmits could be any one of the n stations. So, the probability that only one station transmits and all the other stations don't transmit, in a given time slot, is, $np(1-p)^{n-1}$.

Correct answer is: A

Question No: 24

DIRECTIONS for the question: Mark the best option:

In the following table, the left column contains the names of standard graph algorithms and the right column contains the time complexities of the algorithms. Match each algorithm with its time complexity.

List-I	List-II
1. Bellman-Ford algorithm	A. $O(m \log n)$
2. Kruskal's algorithm	B. $O(n^3)$
3. Floyd-Warshall algorithm	C. $O(nm)$
4. Topological sorting	D. $O(n+m)$

1-C, 2-A, 3-B, 4-D

1-B, 2-D, 3-C, 4-A

1-C, 2-D, 3-A, 4-B

1-B, 2-A, 3-C, 4-D

Explanation Bellman-Ford algorithm : $O(nm)$

Kruskal's algorithm : $O(m \log n)$

Floyd-Warshall algorithm : $O(n^3)$

Topological sorting : $O(n + m)$

Correct answer is: A

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Question No: 25

DIRECTIONS for the question: Mark the best option:

If a query involves NOT, AND, OR with no parenthesis

NOT will be evaluated first; AND will be evaluated second; OR will be evaluated last.

NOT will be evaluated first; OR will be evaluated second; AND will be evaluated last.

AND will be evaluated first; OR will be evaluated second; NOT will be evaluated last.

the order of occurrence determines the order of evaluation.

Explanation

Correct answer is: A

Question No: 26

DIRECTIONS for the question: Mark the best option:

A trigger is

a statement that enables to start any DBMS

a statement that is executed by the user when debugging an application program

a condition the system tests for the validity of the database user

a statement that is executed automatically by the system as a side effect of a modification to the database

Explanation

Correct answer is: D

Question No: 27

DIRECTIONS for the question: Mark the best option:

Consider the following table. (Table Name: train_info)

TrainNum	From	To	Through1	Through2	Through3
1	Chennai	New Delhi	Vijayawada	Jhansi	Agra
2	Vijayawada	New Delhi	Jhansi	Agra	
3	Hyderabad	Kanpur	Vijayawada	Jhansi	
4	Hyderabad	Kanpur	New Delhi	Agra	
5	Vijayawada	Agra	Hyderabad	Jhansi	Kanpur
6	Chennai	Vijayawada			

The SQL statement

```
SQL>SELECT A.From, B.From  
FROM train_info A, train_info B  
GROUP BY (A.From, B.From); will print,
```

6 records

8 records

12 records

none of these

Explanation It will print the following 9 records.

From	To
Chennai	Chennai
Chennai	Hyderabad
Chennai	Vijayawada
Hyderabad	Chennai
Hyderabad	Hyderabad
Hyderabad	Vijayawada
Vijayawada	Chennai
Vijayawada	Hyderabad
Vijayawada	Vijayawada

Correct answer is: D

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Question No: 28

DIRECTIONS for the question: Mark the best option:

A sorting technique is called stable if

it takes $O(n \log n)$ time

it maintains the relative order of occurrence of non-distinct elements

it uses divide and conquer paradigm

it takes $O(n)$ space

Explanation A sorting algorithm is called stable if it keeps elements with equal keys in the same relative order in the output as they were in the input.

Correct answer is: B

Question No: 29

DIRECTIONS for the question: Mark the best option:

Which of the following is true when describing a multicast address?

Packets addressed to a unicast address are delivered to a single interface.

Packets are delivered to all interfaces identified by the address. This is also called a one-to-many address.

Identifies multiple interfaces and is only delivered to one address. This address can also be called one-to-one-of-many.

These addresses are meant for non-routing purposes, but they are almost globally unique so it is unlikely they will have an address overlap.

Explanation

Correct answer is: B

Question No: 30

DIRECTIONS for the question: Mark the best option:

Match the pairs in the following:

List-I	List-II
A. Strassen's matrix multiplication algorithm	P. Greedy method
B. Kruskal's minimum spanning tree algorithm	Q. Dynamic programming
C. Biconnected components algorithm	R. Divide and Conquer
D. Floyd's shortest path algorithm	S. Depth first search

A-R, B-P, C-S, D-Q

A-R, B-S, C-P, D-Q

A-Q, B-S, C-R, D-P

A-P, B-R, C-P, D-S

Explanation

Correct answer is: A

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