

## RPSC\_Paper 1

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How many 3-digit numbers can be obtained from {1, 2, 3, 6, 7} given that a digit can be repeated no more than two times.

- ☐ 5! 3!
- ☐  $5^3$
- ☐ 120
- ☐  $3^5$

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How many triangles can be constructed from 5 points in space. It is given that 3 of these points are collinear.

- ☐  $3 + 3 \times 2 = 9$
- ☐  $5 \times 3 = 15$
- ☐  ${}^5C_3 = 10$
- ☐  $5 \times 5 \times 5 = 125$

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Boolean function  $[(\sim(\sim p \wedge q) \wedge \sim(\sim p \wedge \sim q))] \vee (p \wedge r)$  is equal to the Boolean function

- ☐ q
- ☐  $p \wedge r$
- ☐  $p \vee q$
- ☐ p

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There is a certain four digit number whose fourth digit is twice the first digit. Third digit is three more than second digit. Sum of the first and fourth digits is twice of the third number. Which number is it ?

- ☐ 4368
- ☐ 4638
- ☐ 2034
- ☐ both (1) and (3) are correct

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Which statement is incorrect

- ☐  $A - B = A + (\text{the 2's-complement of } B)$
- ☐  $A - B = 1 + A + (\text{the 1's-complement of } B)$
- ☐  $A - B = A + (\text{the 2's-complement of } B) + 1$
- ☐  $A - B = (\text{the 1's-complement of } B) + A + 1$

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How many ways to order a 5 distinct card deck

- ☐ 120
- ☐ 5
- ☐ 10
- ☐ 15

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Let  $m = \text{"Juan is a math major"}$ ,

$c = \text{"Juan is a computer science major"}$ ,

$g = \text{"Juan's girlfriend is a literature major"}$ ,

$h = \text{"Juan's girlfriend has read Hamlet"}$  and

$t = \text{"Juan's girlfriend has read The Tempest."}$

Which of the following expresses the statement "Juan is a computer science major and a math major, but his girlfriend is a literature major who hasn't read both The Tempest and Hamlet."

- ☐  $c \wedge m \wedge (g \vee (\sim h \vee \sim t))$
- ☐  $c \wedge m \wedge g \wedge (\sim h \wedge \sim t)$
- ☐  $c \wedge m \wedge g \wedge (\sim h \vee \sim t)$
- ☐  $c \wedge m \wedge (g \vee (\sim h \wedge \sim t))$

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Three persons enter a railway compartment. If there are 5 seats vacant, in how many ways can they take these seats?

- ☐ 60
- ☐ 20
- ☐ 15
- ☐ 125

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If  $f(x)$  and  $g(x)$  are defined on domains  $A$ ,  $B$  respectively then the domain of  $f(x) + g(x)$  is

- ☐  $A \cap B$
- ☐  $A - B$
- ☐  $A \cup B$
- ☐ None of these

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Negative numbers can be represented in

- ☐ Signed magnitude form
- ☐ 1's complement form
- ☐ 2's complement form
- ☐ All of these

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If every non-key attribute is fully functionally dependent on the primary key, then the relation will be in

- ☐ First normal form
- ☐ Second normal form
- ☐ Third normal form
- ☐ Fourth normal form

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Which is the correct hierarchy of a database?

- ☐ rows  $\rightarrow$  tablespace  $\rightarrow$  table  $\rightarrow$  database
- ☐ rows  $\rightarrow$  table  $\rightarrow$  tablespace  $\rightarrow$  database
- ☐ database  $\rightarrow$  table  $\rightarrow$  tablespace  $\rightarrow$  rows
- ☐ None of these

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Consider the following set of functional dependencies on the scheme  $(A, B, C)$

$$A \rightarrow BC$$

$$B \rightarrow C$$

$$A \rightarrow B$$

$$AB \rightarrow C$$

The canonical cover for this set is

- ☐  $A \rightarrow BC$  and  $B \rightarrow C$
- ☐  $A \rightarrow BC$  and  $AB \rightarrow C$
- ☐  $A \rightarrow BC$  and  $A \rightarrow B$
- ☐  $A \rightarrow B$  and  $B \rightarrow C$

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Tables derived from the ER-Diagram

- ☐ Are totally normalised
- ☐ Can be further denormalised
- ☐ May have multi-valued attributes
- ☐ Are always in 1NF

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The relationship of DEPARTMENT to the EMPLOYEES is a

- ☐ One-to-one relationship
- ☐ One-to-many relationship
- ☐ Many-to-many relationship
- ☐ Many-to-one relationship

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Maximum Ozone depletion has been observed in

- ☐ Equatorial region
- ☐ Tropical region
- ☐ North America
- ☐ Antarctica

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Which of the following scheme is used to ensure atomicity of transactions in database systems

- ☐ Time-stamp based Protocol
- ☐ Log File

- ☐ Two-phase Locking
- ☐ None of these

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In SQL, which command is used to display data from two or multiple tables

- ☐ LIST
- ☐ SELECT
- ☐ SHOW
- ☐ MULTIPLY

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The two-phase locking protocol ensures

- ☐ Both serializability and recoverability
- ☐ Serializability only
- ☐ Recoverability only
- ☐ None of these

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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
- ☐ It will immediately be rejected
- ☐ It will immediately be granted
- ☐ It will be granted as soon as it is released by A

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Which is an invalid transactional ACID property

- ☐ Atomicity
- ☐ Consistency
- ☐ Isolation
- ☐ Duality

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In which normal form decomposition of a relationship is lossless join but may not be dependency preserving

- ☐ PJNF

- ☐ BCNF
- ☐ 3NF
- ☐ all of these

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Which is the correct property of B Tree

- ☐ Number of keys in each node must be equal number of its children nodes
- ☐ Number of keys in each node must be one less than the number of its children nodes
- ☐ Number of keys in each node must be greater than number of its children nodes
- ☐ Number of keys in each node must be half number of its children nodes

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The district of Rajasthan having no river is

- ☐ Jaisalmer
- ☐ Bikaner
- ☐ Churu
- ☐ Barmer

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In any relation with the functional dependency (FD) is  $A \rightarrow B$ ,  $DB \rightarrow C$  which of the following holds

- ☐  $B \rightarrow A$
- ☐  $DA \rightarrow C$
- ☐  $DB \rightarrow A$
- ☐  $C \rightarrow A$

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The relational algebra expression is equivalent to the following tuple calculus

Expression:  $\{t \mid t \in r \wedge (t[A] = 10 \wedge t[B] = 20)\}$

- ☐  $\sigma_{(A=10 \vee B=20)}(r)$
- ☐  $\sigma_{(A=10)}(r) \cup \sigma_{(B=20)}(r)$

- ☐  $\sigma_{(A=10)}(r) \cap \sigma_{(B=20)}(r)$
- ☐  $\sigma_{(A=10)}(r) - \sigma_{(B=20)}(r)$

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The coronation ceremony of Maharana Pratap was held at

- ☐ Gogunda
- ☐ Chawand
- ☐ Chittor
- ☐ Kunbhalgarh

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Consider a schema R(A, B, C, D) and functional dependencies  $A \rightarrow B$  and  $C \rightarrow D$ .

Then the decomposition of R into R1(AB) and R2(CD) is

- ☐ dependency preserving and lossless join
- ☐ lossless join but not dependency preserving
- ☐ dependency preserving but not lossless join
- ☐ not dependency preserving and not lossless join

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What is the valid sequence of processing a DBMS query?

- ☐ SQL statement->parse->optimize->generate execution
- ☐ SQL statement->validate->parse->optimize->generate execution
- ☐ SQL statement->parse->validate->optimize->generate execution
- ☐ None of these

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The SQL statement select \* from R, Q is equivalent to

- ☐ Select \* from R natural join Q
- ☐ Select \* from R cross join Q
- ☐ Select \* from R union join Q
- ☐ Select \* from R inner join Q

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Which is a DCL command?

- ☐ Grant
- ☐ Commit
- ☐ Update
- ☐ Rollback

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Which one will generate an error?

- ☐ SELECT \* FROM emp WHERE empid = 493945;
- ☐ SELECT empid FROM emp WHERE empid= 493945;
- ☐ SELECT empid FROM emp;
- ☐ SELECT empid WHERE empid = 56949 AND lastname = 'SMITH';

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Which statement is incorrect

- ☐ A weak entity doesn't have a primary key
- ☐ A relation can have multiple number of unique keys
- ☐ Relational algebra is more expressive than relational calculus
- ☐ In a relation ordering of tuples is not substantial

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Which is correct syntax of ALTER TABLE?

- ☐ ALTER TABLE Customer-details  
DROP (Contact\_Phone);
- ☐ ALTER TABLE Customer-Details  
ADD Contact\_Phone Char (10);
- ☐ ALTER TABLE Customer-details  
MODIFY Contact\_Phone Char (12);
- ☐ All of these

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Which is correct statement for Triggers?

- ☐ To maintain views
- ☐ To execute action automatically whenever an event occurs.

- ☐ To implement business rules
- ☐ All of these

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Which is NOT the purpose of normalization of schema

- ☐ Conversion of data to a canonical form to promote schema integration
- ☐ Reduction of the number of anomalies that can occur during inserts, deletes, and updates
- ☐ Elimination of redundant data stored in the database
- ☐ none of these

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The transactional concurrency leads to increase

- ☐ Integrity
- ☐ Consistency
- ☐ Mutual execution
- ☐ Throughput

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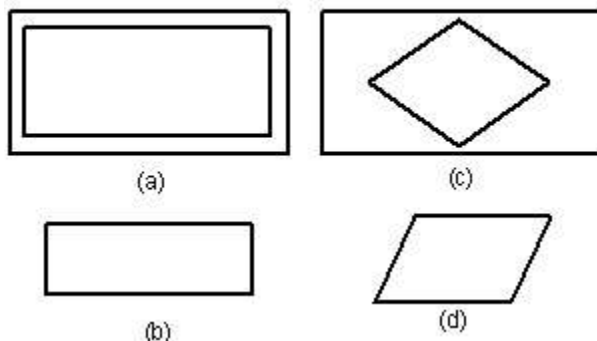
The database schema is written in

- ☐ Data Definition Language
- ☐ Data Manipulation Language
- ☐ Data Control Language
- ☐ Tool Command Language

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Which ER Symbol is used to represent weak entity



- ☐ a

- ☐ b
- ☐ c
- ☐ d

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Which is the correct method to physically store the records in a specified order according to the key field in each record

- ☐ Hash
- ☐ Direct
- ☐ Sequential
- ☐ All of these

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The example of derived attribute is

- ☐ Name if age is given as other attribute
- ☐ Age if date of birth is given as other attribute
- ☐ 1 and 2 both
- ☐ None of these

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This operation is used when a user is interested in only certain columns of a table

- ☐ Selection
- ☐ Union
- ☐ Join
- ☐ Projection

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Which level of database is closest to the user

- ☐ Physical
- ☐ Conceptual
- ☐ Internal
- ☐ External or View based

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Which is correct statement for updating in a table instructor salary by 10 percentages?

- ☐ Update instructor Set salary=salary\*1.10;
- ☐ Update instructor Set salary=110;
- ☐ Update instructor where salary=salary\*1.10;
- ☐ Update instructor In salary=salary\*1.10;

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In a relational algebra, the Cartesian product is

- ☐ Unary operator
- ☐ Binary operator
- ☐ Ternary operator
- ☐ None of these

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In a stored procedure, when specifying a string parameter you should use which one of these data types?

- ☐ CHAR
- ☐ VARCHAR2
- ☐ TEXT
- ☐ REAL

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Which statement correctly differentiates between the Relational database (RDB) and Object Oriented database (OODB) models

- ☐ OODB supports multiple objects in the same database while RDB only supports a single table per database
- ☐ OODB incorporates methods in which the definition of the data structure is given, while RDB does not
- ☐ RDB allows the definition of the relationships between the different tables, while OODB does not allow the relationships to be defined between objects
- ☐ RDB supports indexes, while OODB does not support indexes

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Shekhavati Haveli wall paintings are influenced mainly by

- ☐ Jaipur style
- ☐ Udaipur style
- ☐ Kota style
- ☐ Bundi style

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Which statement is correct for SQL?

- ☐ SQL stands for Standard Query language
- ☐ SQL is procedural language
- ☐ SQL is non-procedural language
- ☐ None of these

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Which of the following statement is correct for ER and relational models?

- ☐ An attribute of an entity can be composite
- ☐ An attribute of an entity can have more than one value
- ☐ In a row of a relational table, an attribute can have exactly one value or a NULL value
- ☐ All of these

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In ER diagram a relationship is represented through.

- ☐ Rectangle
- ☐ Diamond
- ☐ Oval
- ☐ Line

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Meta data is the

- ☐ Collection of data
- ☐ Data about data
- ☐ Medical data
- ☐ None of these

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Which is containing a list of blocks that have been updated in the database buffer?

- ☐ Latches
- ☐ Swap space
- ☐ Dirty block
- ☐ All of these

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Which command is used to delete all the tuples of a table along with structure?

- ☐ Truncate
- ☐ Drop
- ☐ Delete
- ☐ Alter

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Which one of the join operation does not preserve non matched tuples?

- ☐ Natural join
- ☐ Left outer join
- ☐ Right outer join
- ☐ Inner join

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The IEEE standard for Token Bus Protocol is

- ☐ IEEE 802.2
- ☐ IEEE 802.3
- ☐ IEEE 802.4
- ☐ IEEE 802.5

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Which protocol is not correspond to Application layer

- ☐ DNS
- ☐ FTP
- ☐ SMTP
- ☐ RPC

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Which protocol is contention based protocol

- ☐ CSMA
- ☐ Ethernet
- ☐ ALOHA
- ☐ All of these

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Which of the following pairs is incorrect

- ☐ Application layer- Error detection
- ☐ Transport layer- Reliability
- ☐ Network layer- Address Resolution
- ☐ Data link layer- Framing

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Which of the following is NOT a basic element of Ethernet?

- ☐ An Ethernet packet or frame
- ☐ Media access control protocols
- ☐ A router
- ☐ Physical media used to carry the signal

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Maximum throughput of Pure Aloha is

- ☐ 36.8% of a given load
- ☐ 26.8% of a given load
- ☐ 18.4% of a given load
- ☐ 46.6% of a given load

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Identify the class of IPv4 address 191.1.1.2.3.

- ☐ Class A
- ☐ Class B
- ☐ Class C
- ☐ Class D

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Connection less service in packet switched networks is most suitable for

- ☐ File transfer operation
- ☐ Electronic Mail
- ☐ DNS queries
- ☐ HTTP

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Which Project 802 standard provides for a collision-free protocol?

- ☐ IEEE 802.3
- ☐ IEEE 802.4
- ☐ IEEE 802.5
- ☐ Both (2) and (3)

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When data and acknowledgment are sent on the same frame, this is called

- ☐ piggybacking
- ☐ backpacking
- ☐ piggypacking
- ☐ a good idea

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10Base2 and 10Base5 have different\_\_\_\_\_

- ☐ signal band types
- ☐ fields on the 802.3 frame
- ☐ maximum segment lengths
- ☐ maximum data rates

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Which IPv4 address class has few Net-ID per network?

- ☐ Class A
- ☐ Class B
- ☐ Class C
- ☐ Class D

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In CRC there is no error if the remainder at the receiver is\_\_\_\_\_

- ☐ equal to the remainder at the sender
- ☐ zero
- ☐ nonzero
- ☐ the quotient at the sender

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Which is correct statement for need of Time to Live (TTL) field in an IP datagram?

- ☐ It can be used to prioritize packets
- ☐ It can be used to reduce delays
- ☐ It can be used to optimize throughput
- ☐ It can be used to prevent packet looping

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A timer is set when \_\_\_\_\_ is sent out

- ☐ a packet
- ☐ an ACK
- ☐ a NAK
- ☐ all of these

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The shortest frame in HDLC protocol is usually the \_\_\_\_\_ frame.

- ☐ management
- ☐ supervisory
- ☐ information
- ☐ none of the these

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The purpose of Reverse ARP on a network is to find the \_\_\_\_\_ given the \_\_\_\_\_.

- ☐ Internet address, domain name
- ☐ Internet address, netid
- ☐ Internet address, station MAC address
- ☐ Station MAC address, Internet address

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Ideally the maximum segment length that can be supported by the UTP cable is

- ☐ 100 meters
- ☐ 200 meters
- ☐ 500 meters
- ☐ 600 meters

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The size of the congestion Window in the slow start phase of the TCP congestion control algorithm

- ☐ Does not increase
- ☐ Increases linearly
- ☐ Increases quadratically
- ☐ Increases exponentially

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A television broadcast is an example of \_\_\_\_\_ transmission.

- ☐ Half-duplex
- ☐ Full-duplex
- ☐ Simplex
- ☐ Automatic

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For Stop-and-Wait ARQ, for 10 data packets sent, \_\_\_\_\_ acknowledgments are needed.

- ☐ 9
- ☐ 10
- ☐ 11
- ☐ 20

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Number of bit used for host id in IPv4 Class A addressing is

- ☐ 8 bits
- ☐ 12 bits
- ☐ 16 bits
- ☐ 24 bits

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Which is a correct statement related to IPv6 addressing

- ☐ IPv6 increases the size of the IP address from 32 to 128 bits
- ☐ IPv6 has 40-byte fixed-length header
- ☐ In addition to unicast and multicast addresses IPv6 support anycast addressing
- ☐ All of these

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Match the following

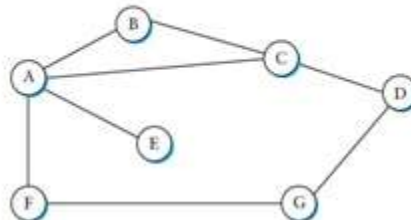
| IEEE standard | Topology      |
|---------------|---------------|
| A) IEEE 802.3 | 1. Link State |
| B) IEEE 802.4 | 2 Token Bus   |
| C) IEEE 802.5 | 3. FDDI       |
| D) IEEE 802.2 | 4. Ethernet   |
|               | 5. Token ring |

- ☐ A    B    C    D  
          1    2    4    3  
          A    B    C    D
- ☐ 4    2    5    1  
          A    B    C    D
- ☐ 4    2    3    5  
          A    B    C    D
- ☐ 1    4    2    3

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The final routing table at node A for the network given is, when each link cost is 1



- Destination    Cost    NextHop  
 B                1        B  
 C                1        C  
 D                2        C  
 E                1        E  
 F                1        F  
 G                2        F
- ☐

| Destination | Cost | NextHop |
|-------------|------|---------|
| B           | 1    | B       |
| C           | 1    | C       |
| D           | 4    | C       |
| E           | 1    | E       |
| F           | 1    | F       |
| G           | 4    | F       |

| Destination | Cost | NextHop |
|-------------|------|---------|
| B           | 1    | B       |
| C           | 1    | C       |
| D           | 2    | C       |
| E           | 1    | E       |
| F           | 1    | F       |
| G           | 2    | F       |

| Destination | Cost | NextHop |
|-------------|------|---------|
| B           | 0    | B       |
| C           | 0    | C       |
| D           | 3    | C       |
| E           | 0    | E       |
| F           | 0    | F       |
| G           | 3    | F       |

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In a Go-Back-N ARQ, if the window size is 63, what is the range of sequence numbers?

- ☐ 0 to 63
- ☐ 1 to 63
- ☐ 0 to 64
- ☐ 1 to 64

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Who is the present chief Justice of Rajasthan High Court?

- ☐ Justice Sunil Ambwani
- ☐ Justice Ajit Singh
- ☐ Justice Mahesh Chand Sharma
- ☐ Justice S.K.Mittal

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The IEEE 802.3 LAN standards support

- ☐ IEEE 802.3u
- ☐ Fast Ethernet 100BASE-TX
- ☐ Ethernet 10BASE-T
- ☐ All of these

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A digital signal system is required to operate at 9600bps, if the signal element encodes a 4 bit word, what is the minimum required bandwidth of the channel?

- ☐ 2000Hz
- ☐ 2200Hz
- ☐ 2300Hz
- ☐ 2400Hz

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For an ALOHA system using a 9600-bps channel for sending 120-bit-long packets the possible throughput is

- ☐ 10 pkts per second
- ☐ 14 pkts per second
- ☐ 20 pkts per second
- ☐ 24 pkts per second

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A specially programmed router that sits between a site (intranet) and the rest of the network to control the flow of traffic between the Internet and internal networks and systems and works like a guard post in the lobby of a building is referred to as

- ☐ Proxy
- ☐ PIX
- ☐ Firewall
- ☐ All of these

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An advantage of packet switching is

- ☐ Better utilization of network links
- ☐ Lower propagation delay
- ☐ Less electro-magnetic interference

- ☐ Delay guarantees in voice communications

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Consider an ARQ protocol running over a 20 km point to point fiber link. Assume a propagation speed of  $2 \times 10^8$  m/s. a suitable timeout value for the ARQ protocol may be:

- ☐ 0.4 ms.
- ☐ 0.3 ms.
- ☐ 0.2 ms.
- ☐ 0.1 ms.

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The X.25 protocol encapsulates the following layers

- ☐ Data Link Layer
- ☐ Network Layer
- ☐ Both (1) and (2)
- ☐ None of these

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189 RPSC\_March-2016\_Paper 1

This layer in the OSI model handles terminal emulation

- ☐ Session
- ☐ Presentation
- ☐ Transport
- ☐ Application

**91 of 100**

190 RPSC\_March-2016\_Paper 1

Which is untrue for the RPC

- ☐ Allow programs to call procedures located on other machines
- ☐ Avoids the overhead of multiple system calls
- ☐ Allows communication through global variables
- ☐ Provides programmers with a familiar procedural interface

**92 of 100**

191 RPSC\_March-2016\_Paper 1

Which is the correct matching of protocol given below with their layer of abstraction

| Protocol   | Layer                |
|------------|----------------------|
| A. CIDR    | 1. Data Link Layer   |
| B. RIP     | 2. Network layer     |
| C. FTP     | 3. Transport layer   |
| D. CSMA/CD | 4. Application layer |

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

93 of 100

192 RPSC\_March-2016\_Paper 1

Which of the following is the bit oriented protocol

- ☐ Link Access Protocol Balanced (LAPB)
- ☐ Synchronous Data link Control Protocol (SDLC)
- ☐ Link Access Protocol for D channel (LAP-D)
- ☐ All of these

94 of 100

193 RPSC\_March-2016\_Paper 1

Which is the correct statement related to Ethernet based network

- ☐ Ethernet packet should be at least 64 bytes long for longest allowed segment and Max packet size can be 1500 bytes
- ☐ Ethernet packet should be at least 32 bytes long for longest allowed segment and Max packet size can be 1024 bytes
- ☐ Ethernet packet should be at least 16 bytes long for longest allowed segment and Max packet size can be 64 bytes
- ☐ Ethernet packet should be at least 48 bytes long for longest allowed segment and Max packet size can be 1482 bytes

95 of 100

194 RPSC\_March-2016\_Paper 1

The state of Rajasthan is divided into how many administrative divisions?

- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8

**96 of 100**

195 RPSC\_March-2016\_Paper 1

The Hamming code is used to perform

- ☐ Error detection
- ☐ Error correction
- ☐ Error encapsulation
- ☐ both (1) and (2)

**97 of 100**

196 RPSC\_March-2016\_Paper 1

Which layer of TCP/IP is responsible for end to end delivery of entire message in a network?

- ☐ Application layer
- ☐ Presentation layer
- ☐ Transport layer
- ☐ Network layer

**98 of 100**

197 RPSC\_March-2016\_Paper 1

The process that dynamically assigns an IP address to a network device is called?

- ☐ DNS
- ☐ DHCP
- ☐ NAT
- ☐ MAC

**99 of 100**

198 RPSC\_March-2016\_Paper 1

The modem is used to converts

- ☐ Analog , Digital
- ☐ Digital, Analog
- ☐ PSK,FSK
- ☐ Both (1) and (2)

**100 of 100**

Which of the following is correct for Sliding Window ARQ protocol

- ☐ Source Window= N Destination Window = N
- ☐ Source Window = 1, Destination Window = N
- ☐ Source Window = 1 Destination Window = 1
- ☐ Source Window = N, Destination Window = 1