



Kunal Jha

Course: GATE
Computer Science Engineering(CS)

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TOPICWISE : COMPUTER NETWORKS-1 (GATE - 2020) - REPORTS

OVERALL ANALYSIS

COMPARISON REPORT

SOLUTION REPORT

ALL(17)

CORRECT(6)

INCORRECT(2)

SKIPPED(9)



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Q. 1

▶ Solution Video

Have any Doubt ?



Which of the following is correct?

A Both DES and AES takes a 64 bit plain text.**B** Number of rounds in DES is more than number of rounds in AES.

Correct Option

Solution :(b)
DES takes 64 bit plain text and AES takes 128 bit plain text.
Number of rounds in DES is 16 and in AES is 10 or 12 or 14.
RSA uses public and private key.**C** RSA uses same set of keys for encryption and decryption.**D** None of these

QUESTION ANALYTICS



Q. 2

▶ Solution Video

Have any Doubt ?



Consider the following statements:

S_1 : Packet processing delay is same at every router.
 S_2 : Bridge work in data link layer and network layer.
 S_3 : Repeater occurs at only physical layer.

Which of the above statement is not correct?

A S_1 only**B** S_1 and S_3 only

Your answer is Wrong

C S_1 and S_2 only

Correct Option

Solution :(c)
 S_1 : Packet processing delay is depend on capacity, bandwidth and other factor it different for different router.
 S_2 : Bridge work in physical and data link layer not network layer.
 S_3 : Repeater occurs at only physical layer.**D** S_2 only

QUESTION ANALYTICS



Q. 3

▶ Solution Video

Have any Doubt ?



Match List-I with List-II and select the correct answer using the codes given below:

List-I (Protocol Layers) List-II (Type of address used)

- | | |
|----------------------|-----------------|
| A. Application layer | 1. IP address |
| B. Network Layer | 2. Port address |
| C. Data link layer | 3. MAC address |

Codes:

- | | | |
|-----------|-----------|-----------|
| A | B | C |
| (a) 1 2 3 | (b) 2 3 1 | (c) 2 1 3 |
| (d) 3 1 2 | | |

A a**B** b**C** c

Your answer is Correct

Solution :(c)
Application layer uses port numbers (address).
Network layer deals with IP addresses and Data link layer deals with physical address of the device (MAC address).

D d

QUESTION ANALYTICS

+

Q. 4

Solution Video

Have any Doubt ?

Bookmark

Which of the following is true?

- A Hidden terminal can be handled by using RTS/CTS.

Correct Option

Solution :

(a)

Both RTS and CTS control frames are required to deal with hidden terminals.

RTS/CTS exchanges help to reduce collision but it used the more channel resources and not efficient use of channel resources.

- B RTS/CTS exchanges help in reducing collisions and do efficient uses of channel resources.

- C Both (a) and (b)

- D None of these

QUESTION ANALYTICS

+

Q. 5

Solution Video

Have any Doubt ?

Bookmark

Which of the following are not true in IEEE 802.3 ?

- I. The maximum frame size that is supported by IEEE 802.3 is 1500 bytes
- II. The maximum payload that is supported by IEEE 802.3 is 1518 bytes
- III. Minimum frame size and payload size are 46 and 64 bytes respectively.

- A III only

- B II and III only

- C I and II only

- D All of these

Correct Option

Solution :

(d)

Maximum frame size = 1518 bytes

Maximum payload size = 1500 bytes

Minimum frame size = 64 bytes

Minimum payload size = 46 bytes

QUESTION ANALYTICS

+

Q. 6

Solution Video

Have any Doubt ?

Bookmark

Consider a CSMA/CD with frame size is 20 KB and transmission rate is 10 Kbps, then maximum length of the cable (km) required, if signal speed is 15 km/sec _____. (Upto 2 decimal places)

- 0.24 [0.23 - 0.25]

Correct Option

Solution :

0.24 [0.23 - 0.25]

In CSMA/CD

Transmission time $\geq 2 \times$ Propagation Time

Suppose X is cable length

$$\frac{20 \text{ KB}}{10 \text{ Mbps}} \geq 2 \times \frac{X}{15 \text{ Km/sec}}$$

$$\frac{20 \times 8 \times 15 \times 10^3 \text{ Km/sec}}{10 \times 10^6} \geq X$$

$$240 \geq X$$

240 meter or 0.24 km.



Your Answer is 120

QUESTION ANALYTICS

+

Q. 7

Solution Video

Have any Doubt ?

Bookmark

Suppose station X sends a message with 15 packets to station B using sliding window of size 4, selective repeat is used and every 5th packet is lost, number of transmission required to send all 15 packets to Y _____

Solution:

18

Window size is 4, if a packet is lost same packet will be retransmitted again



Total 18 packet is transmitted.

QUESTION ANALYTICS**Q. 8****Solution Video****Have any Doubt ?**Consider a slotted aloha with 2 Mbps ethernet, what is the throughput (in Kbps) for slotted aloha at $G = 3$ _____. (Upto 1 decimal place)**298.6 [298.5 - 298.7]****Correct Option****Solution:**

298.6 [298.5 - 298.7]

For slotted aloha throughput

$$\begin{aligned} S &= Ge^{-G} \\ &= 3 \times e^{-3} = \frac{3}{20.085} \\ &= 0.1493 \times 100 = 14.93\% \\ &= \frac{14.93 \times 2 \times 10^3 \text{ Kbps}}{100} = 298.6 \end{aligned}$$

QUESTION ANALYTICS**Q. 9****Solution Video****Have any Doubt ?**

CSMA network with P-persistent, there are 8 system the probability of station transmitting the data is 0.3, the probability that channel is collision free _____. (Upto 2 decimal places)

0.19 [0.18 - 0.20]**Correct Option****Solution:**

0.19 [0.18 - 0.20]

System is collision free if only one station is sending data at a time

$$\begin{aligned} P &= {}^8C_1 \times (p)^r \times (q)^{8-r} \\ &= {}^8C_1 \times (0.3)^1 \times (0.7)^7 \\ &= 8 \times 0.3 \times 0.0823 = 0.198 \end{aligned}$$

QUESTION ANALYTICS**Q. 10****Solution Video****Have any Doubt ?**

Consider the following statements:

 S_1 : Ethernet frame include checksum field. S_2 : ARP request is normally broadcast and ARP reply is normally unicast. S_3 : Differential Manchester encoding has a transition at the middle of each bit.

Which of the above statement is correct?

A S_1 and S_2 only**B** S_3 only**C** S_1 and S_3 only**D** S_2 and S_3 onlyYour answer is **Correct****Solution:**

(d)

 S_1 : Ethernet frame include CRC not checksum. S_2 : ARP request is broadcast and reply is unicast. S_3 : Differential Manchester encoding has a transition at the middle of each bit. S_2 and S_3 both are true.**QUESTION ANALYTICS**



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ALL(17)

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INCORRECT(2)

SKIPPED(9)

Q. 11

Solution Video

Have any Doubt ?



Which of the following statements is/are true?

- I. GBN uses both individual and cumulative acknowledgement.
- II. Selective repeat (SR) uses individual acknowledgement but not cumulative ACK.
- III. If maximum window size is Q then number of sequence bits for SR protocol is $\log_2 (1 + Q)$

 A I and II only

Correct Option

Solution :

(a)
GBN uses both individual and cumulative acknowledgement and SR uses only individual acknowledgement. If maximum window size is Q when number of sequence bits for SR in $\log_2 (2Q)$.

 B II and III only C I only D I and III only

QUESTION ANALYTICS



Q. 12

Solution Video

Have any Doubt ?

A bit stream 10110001 is transmitted using the standard CRC method, if generator polynomial is $x^3 + 1$, which is the following bit stream is received by the receiver if there is no noise. A 10110001100 B 10110001110 C 10110001101

Your answer is Correct

Solution :
(c)
Bit stream 10110001
101 will be added.
Data sent is 10110001101. D 10110001011

QUESTION ANALYTICS



Q. 13

Solution Video

Have any Doubt ?



By default router is

 A Collision domain separator B Broadcast domain separator C Both (a) and (b)

Your answer is Correct

Solution :
(c) D None of these

QUESTION ANALYTICS



Q. 14

Solution Video

Have any Doubt ?



Which of the following are true?

- (i) In Asynchronous serial transfer extra bits are also treated as the part of data
- (ii) In synchronous serial transfer synchronous bits are treated as the part of data
- (iii) IEEE 802.3 is a contention less protocol
- (iv) IEEE 802.5 is a contention protocol

QUESTION 11 IEEE 802.11 QoS contention protocol

A only (ii), (iii) and (iv)

B Only (i), (ii) and (iv)

C Only (i)

Correct Option

Solution :

(c)

In synchronous transmission the synchronous bits are neglected by receiver hence not considered as part of data.

D Only (iii)

QUESTION ANALYTICS



Q. 15

Solution Video

Have any Doubt ?



In a RSA algorithm, it uses two prime numbers $p = 13$, $q = 17$ to generate public and private keys. Public key is 35 then private key is _____.

11

Correct Option

Solution :

11

$$\begin{aligned} n &= p \times q \\ &= 13 \times 17 = 221 \\ \phi(n) &= (p - 1) \times (q - 1) \\ &= 12 \times 16 = 192 \end{aligned}$$

$$\begin{aligned} (d \times e) \bmod \phi(n) &= 1 \\ (d \times 35) \bmod 192 &= 1 \\ d &= 11 \end{aligned}$$

Alternate solution:

$$\begin{aligned} d \times e &= 1 \% \phi(n) \\ d \times e &= 1 + k \cdot \phi(n) \\ d &= \frac{1 + k \cdot \phi(n)}{e} \\ \text{where } k &= 0, 1, 2, \dots \end{aligned}$$

QUESTION ANALYTICS



Q. 16

Solution Video

Have any Doubt ?



Suppose A and B uses Diffie Hellman protocol to exchanging the key, value of $N = 23$, $a = 7$, if A choose 3 and B choose 5, secret key generated by the protocol _____.

14

Correct Option

Solution :

14

$$\begin{aligned} N &= 23, a = 7 \text{ A chooses 3} \\ A_1 &= 7^3 \bmod 23 = 21 \end{aligned}$$

B choose 5

$$B_1 = 7^5 \bmod 23 = 17$$

A send 21 to B and B send 17 to A

$$\begin{aligned} \text{Key} &= (17)^3 \bmod 23 = 14 \\ \text{or} \\ \text{Key} &= (21)^5 \bmod 23 = 14 \end{aligned}$$

QUESTION ANALYTICS



Q. 17

Solution Video

Have any Doubt ?



Consider a system with link utilization is 50%, R.T.T. = 50 μ sec, Bandwidth = 10 Mbps. What is data size (in bits) _____.

500

Your answer is **Correct** 500

Solution :

500

Transmission Time = $2 \times P.T.$

$$\frac{\text{Data size}}{\text{Bandwidth}} = 2 \times \left(\frac{L}{V} \right)$$

$$\begin{aligned} \frac{x}{10^7 \text{ bits/sec}} &= 50 \mu\text{sec} \\ x &= 500 \text{ bits} \end{aligned}$$

QUESTION ANALYTICS





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ALL(17)

CORRECT(10)

INCORRECT(3)

SKIPPED(4)

Q. 1

Solution Video

Have any Doubt ?



Which of the following functionality is not supported by IPv6

 A Multicasting B Broadcasting

Correct Option

Solution :

(b) IPv6 supports multicasting, unicasting, anycasting but it does not support broadcasting.

 C Unicasting D Anycasting

QUESTION ANALYTICS



Q. 2

Solution Video

Have any Doubt ?



Which of the following is true?

 A ICMP error message generated only for the first fragment.

Your answer is Correct

Solution :

(a) ICMP error message generated only for the first fragment.
Distance vector is intra domain protocol, LSR uses Dijkstra's algorithm.
OSPF is intra domain protocol based on link state routing.
So option (a) is correct. B Distance vector is inter domain protocol. C Link state routing uses Bellman Ford algorithm to compute distance. D OSPF is inter domain protocol.

QUESTION ANALYTICS



Q. 3

Solution Video

Have any Doubt ?



Which of the following is correct?

 A SMTP can send image files with the help of POP3.

Your answer is Correct

Solution :

(b) SMTP is text based protocol, with the help of MIME image can be sent, POP3 is used to retrieve the data.
IMAP4 is more secure than POP3, HTTP is stateless protocol.
DNS uses UDP protocol. C HTTP is stateful protocol. D DNS uses TCP protocol for reliable data transfer.

QUESTION ANALYTICS



Q. 4

Solution Video

Have any Doubt ?



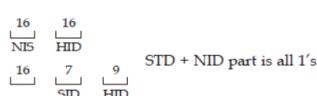
Consider a class B network with 100 subnets each with 160 systems. What is the subnet mask of this network?

 A 255.255.255.190 B 255.255.255.180

Your answer is Correct

Solution :

(c) Number of subnets = 100 7 bit of HID part



255.255.254.0

D 250.255.254.128

QUESTION ANALYTICS

+

Q. 5

Q

Which of the following is true?

A TCP depends on ICMP to send error reporting messages.**B** Packet switching is based on store and forward technique.

Your answer is Correct

Solution :

(b)

TCP has error control mechanism, it does not depend on ICMP for error reporting message. Packet switching is based on store and forward technique. Functionality of network layer is source to destination delivery of packets.

C Packet delivery in correct order is the functionality that must be implemented by network layer.**D** Both (b) and (c)

QUESTION ANALYTICS

+

Q. 6

Q

Consider a IP address 201.24.58.69 in classful address, if the number of 1's in directed broadcast address is a and number of 1's in network ID of the given IP address is b , value of $a + b$ _____.**28**

Correct Option

Solution :

28

IP address 201.24.58.69 belongs to class C network

$$\begin{aligned} \text{Network ID} &= 201.24.58.0 \\ &= 11001001.00011000.00111010.00000000 \end{aligned}$$

Number of 1's = 10 = a

Directed broadcast address DBA = 201.24.58.255

$$= 11001001.00011000.00111010.11111111$$

Number of 1's = 18 = b

$$a + b = 18 + 10 = 28$$

Your Answer is 18

QUESTION ANALYTICS

+

Q. 7

Q

Suppose a system has 50 MB data to send on a network and transmit the data in burst at 8 Mbps, the maximum transmission rate across routers in the network is 6 Mbps, if system uses leaky bucket algorithm, the capacity (in MB) that bucket must hold so that no data is discarded is _____ (Upto 1 decimal place)

12.5 [12.4 - 12.6]

Your answer is Correct 12.5

Solution :

12.5 [12.4 - 12.6]

$$\text{Time for transmission of 50 MB data} = \frac{50 \text{ MB}}{8 \text{ Mbps}} = 6.25 \text{ sec}$$

Maximum transmission rate = 6 Mbps

Actual amount of data sent on the network in 6.25 sec

$$= 6.25 \times 6 = 37.5$$

$$\text{Bucket size} = 50 - 37.5 = 12.5 \text{ MB}$$

QUESTION ANALYTICS

+

Q. 8

[▶ Solution Video](#)[Have any Doubt ?](#)

Assume that the TCP Round Trip Time (RTT) is currently 28 msec and the following ACK's come in after 29, 33, 22 ms respectively. What is the new estimate RTT (ms) using Jacobson's algorithm ($\alpha = 0.8$) _____. (Upto 2 decimal places)

 27.72 [27.70 - 27.74]

Correct Option

Solution :
 $27.72 [27.70 - 27.74]$

$$\text{ERTT} = \alpha \text{IRTT} + (1 - \alpha) \text{NRTT}$$

ERTT is estimated RTT, IRTT is initial RTT and NRTT is new RTT

$$\text{ERTT} = 0.8 \times 28 + 0.2 \times 29 = 28.2$$

When 2nd ACK come

$$\text{ERTT} = 28.2 \times 0.8 + 0.2 + 33 = 29.16$$

When 3rd ACK come

$$\text{ERTT} = 29.16 \times 0.8 + 0.2 + 22 = 27.72$$



Your Answer is 27.78

QUESTION ANALYTICS



Q. 9

[▶ Solution Video](#)[Have any Doubt ?](#)

In Pseudo network, if total length bits is 16, fragment offset is 12 bits then what multiple of fragment offset will indicate the starting address of fragment _____.

 16

Correct Option

Solution :
16

$$2^{16 - 12} = 2^4 = 16$$

QUESTION ANALYTICS



Q. 10

[▶ Solution Video](#)[Have any Doubt ?](#)

An organization is granted the block 178.52.0.0/16, the administrator wants to create 510 subnets, what is the first and last IP address respectively in the last subnet that can be assigned to the host?

 A 178.52.255.120/25, 178.52.254.254/25

 B 178.52.255.129/16, 178.52.255.129/16

 C 178.52.255.128/26, 178.52.255.254/25

 D 178.52.255.129/25, 178.52.255.254/25

Your answer is Correct

Solution :
(d)
Block size 178.52.0.0/16
For 510 subnet 9 bit is needed

$$\text{Subnet Id} = 178.52.255.128$$

From the remaining bits in host ID part will be used for addressing.

First address that can be assigned = 178.52.255.129/25

$$\text{Last address} = 178.52.255.254/25$$

QUESTION ANALYTICS





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ALL(17)

CORRECT(10)

INCORRECT(3)

SKIPPED(4)

Q. 11

Solution Video

Have any Doubt ?



Which of the following statements is/are not correct?

- (i) HTTP can use only single TCP connection between the same client and server.
- (ii) POP protocol is used to download an e-mail from mailbox server to a mail client.
- (iii) Digital signature ensures authenticity of the sender.

 A Only (i)

Your answer is Correct

Solution :

- (a) HTTP can use multiple TCP connection between same client and server.
- (ii) and (iii) is correct statements.

 B Only (ii) C Only (i) and (iii) D Only (iii)

QUESTION ANALYTICS



Q. 12

Solution Video

Have any Doubt ?



Consider the following statements:

 S_1 : Persistent timer is used to prevent deadlock in TCP timers. S_2 : Keep alive timer is runs for twice the maximum packet life time to make sure that all packets are died off when connection is closed.

Which of the above statement is correct?

 A S_1 only B S_2 only C Both S_1 and S_2

Your answer is Correct

Solution :

(c)

- S_1 : Persistent timer is used to prevent deadlock, when receiver sends an acknowledgement with a window size 0, after that when window size updated receiver sends the capacity to sender but if ack is lost, then both will be waiting.
 S_2 is correct statement.

 D Neither S_1 nor S_2

QUESTION ANALYTICS



Q. 13

Solution Video

Have any Doubt ?



Protocol field in IPv4 header is 1. It indicates

 A TCP packet B ICMP packet

Your answer is Correct

Solution :

(b)

 C UDP packet D None of these

QUESTION ANALYTICS



Q. 14

Solution Video

Have any Doubt ?



Consider the following IP addresses and which of the following IP address may represents last host or any subnet, given subnet mask is 255.255.255.224?
 (i) 196.24.63.127
 (ii) 196.24.63.94
 (iii) 196.24.63.62

A (i) and (ii)

B (ii) and (iii)

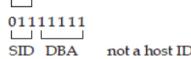
Correct Option

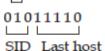
Solution :

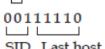
(b)

Subnet mask 255.255.255.224

All IP addresses given is class C address, 3 bit is used for subnetting.

(i) 196.24.63.127


(ii) 196.24.63.94


(iii) 196.24.63.62


(ii) and (iii) represent last host ID.

C (i) and (iii)

D Only (i)

 QUESTION ANALYTICS

+

Q. 15

 Solution Video

 Have any Doubt?

Q

Consider the following statement about socket API in TCP.

S_1 : Listen() used on server side, cause a bound TCP socket to enter listening state.

S_2 : Bind(), associates a socket with socket address structure.

S_3 : Connect (), it assign a free local part number to a socket.

The number of correct statements _____.

 3

Correct Option

Solution :

3

Listen() used on server side and cause a bound TCP socket to enter listening state.

S_2 and S_3 are correct.

 QUESTION ANALYTICS

+

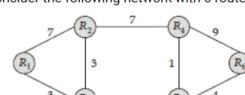
Q. 16

 Solution Video

 Have any Doubt?

Q

Consider the following network with 6 routers, R_1 to R_6 connected with links having weights as shown in the following diagram:



All the routers use the distance vector based routing algorithm to update their routing tables. Each router starts with its routing table initialized to contain an entry for each neighbour with the weight of the respective connecting link. After all the routing tables stabilize, The number of links are there in the network which if goes down, don't led to count-to-infinity problem _____.

 2

Your answer is Correct2

Solution :

2

If we prepare the routing tables for each of the six routers, we will get

R_1	R_2	R_3	R_4	R_5	R_6
R_2 6 R_3	R_1 6 R_3	R_1 3 -	R_1 13 R_2	R_1 13 R_3	R_1 17 R_5
R_3 3 -	R_3 3 -	R_2 3 -	R_2 7 -	R_2 8 R_2	R_2 12 R_3
R_4 13 R_3	R_4 7 -	R_4 10 R_2	R_3 10 -	R_3 14 R_5	R_4 5 R_5
R_5 13 R_3	R_5 8 R_4	R_5 10 -	R_4 1 -	R_6 4 -	R_5 4 -
R_6 17 R_3	R_6 12 R_4	R_6 14 R_5			

So, it can be clearly visualize from all the routing table construction that we never use the direct path



Hence, even if these links are removed from the network or if there link go-down, they won't led to count-to-infinity problem.

 QUESTION ANALYTICS

+

Consider a system with transmission time 50 msec, propagation time 25 msec then link utilization (%) of channel if stop and wait protocol is used _____.

50

Correct Option

Solution :

50

$$\begin{aligned}\text{Link utilization} &= \frac{1}{1+2a} \\ &= \frac{1}{1+2\times\frac{25}{50}} = 0.5\end{aligned}$$

In percent $0.5 \times 100 = 50$

Your Answer is 2

QUESTION ANALYTICS

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OVERALL ANALYSIS COMPARISON REPORT **SOLUTION REPORT**

ALL(33) CORRECT(8) INCORRECT(13) SKIPPED(12)

Q. 1

Solution Video

Have any Doubt ?



Consider a wireless link where the probability of packet error is 0.4, stop and wait protocol is used, assume channel is independent from transmission to transmission, the average number of transmission attempts required to N packet is 250, what is the value of N?

A 220

B 160

C 180

D 150

Your answer is Correct

Solution:

(d)

$$\text{Number of retransmission for one frame} = \frac{1}{1-P}$$

P is probability of error

$$\text{Number of retransmission for } N \text{ frame} = \frac{N}{1-P}$$

$$250 = \frac{N}{1-0.4}$$

$$250 = \frac{N}{0.6}$$

$$N = 150$$

QUESTION ANALYTICS



Q. 2

Solution Video

Have any Doubt ?



Match List-I with List-II and select the correct answer using the codes given below:

List-I

- A. 10.0.0.0 – 10.255.255.255
- B. 0.0.0.0
- C. 255.255.255.255
- D. 127.0.0.0 – 127.255.255.255

List-II

- 1. Limited broadcast
- 2. Unknown network/default
- 3. Reserved for private use
- 4. Reserved for loop back/local address

Codes:

A	B	C	D
(a) 3 2 1 4			
(b) 2 3 4 1			
(c) 3 4 1 2			
(d) 2 4 3 1			

A a

Your answer is Correct

Solution:

(a)

10.0.0.0 – 10.255.255.255 is used for private address
 0.0.0.0 is default address
 255.255.255.255 is limited broadcast address
 127.0.0.0 – 127.255.255.255 is loop back address

B b

C c

D d

QUESTION ANALYTICS



Q. 3

Solution Video

Have any Doubt ?



Consider the following statements:

- I. Two distinct webpages can be sent over the same persistent connection.
- II. To correct 'd' error, there must be 'd+1' hamming distance.

Which of the above statement is/are true?

A Both I and II

B I only

Correct Option

Solution :

- (b)
- Two distinct webpages can be sent over the same persistent connection.
 - To correct ' d ' error, there must be $2d + 1$ hamming distance and ' $d + 1$ ' distance to detect ' d ' error.

C II only**D** Neither I nor IIYour answer is **Wrong**

QUESTION ANALYTICS

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Q. 4

Solution Video

Have any Doubt ?

|

Consider the following set of code words:

00000000, 00000011, 00001010, 01010100, 01011001, 00101011

What is the maximum hamming distance between these code words?

A 6**B** 7

Correct Option

Solution :

(b)
Maximum hamming distance
01010100
00101011

Hamming distance between these two code words is 7, it is the maximum hamming distance.

C 5**D** 4

QUESTION ANALYTICS

+

Q. 5

Solution Video

Have any Doubt ?

|

A node A on a 10 Mbps network is regulated by a token bucket, the token bucket is filled at a rate of 2 Mbps. Token bucket is initially filled with 24 megabits. What is the maximum duration taken by A to transmit at full rate of 10 Mbps? (sec)

A 1**B** 2.5**C** 2**D** 3Your answer is **Correct****Solution :**

(d)
Data transfer rate of token bucket = 10 Mbps
Initially filled to capacity 24 megabits
Maximum duration = $\frac{24}{(10-2)} = \frac{24}{8} = 3$ sec

QUESTION ANALYTICS

+

Q. 6

Solution Video

Have any Doubt ?

|

In IPv6, which of the following address is used if a LAN uses the internet protocols but it is not connected to internet for security reasons?

A Site local address**B** Link local address

Correct Option

Solution :

(b)
Link local address is used when LAN uses the internet protocols but it is not connected to internet for security reasons (no router is involved).

C Global IP address**D** None of these

QUESTION ANALYTICS

+

Q. 7

Solution Video

Have any Doubt ?



Which of the following is true?

- A Standard FTP uses reserved port 23.
- B AES is based on asymmetric key cryptography.
- C Recovering lost packets between two directly connected nodes is done by transport layer.
- D None of these

Your answer is Wrong

Correct Option

Solution :

(d)
Standard FTP uses reserved port 20 and 21
AES is based on symmetric key cryptography
Recovering lost packets between two directly connected nodes is done by data link layer.

Q. 8

Solution Video

Have any Doubt ?



A packet whose destination is outside the local TCP/IP network segment is sent to?

- A File server
- B DNS server
- C Default gateway
- D DHCP server

Correct Option

Solution :

(c)
A default gateway server act as access point to IP router that network computer uses to send information to a computer in another network or internet.

Q. 9

Solution Video

Have any Doubt ?



Which of the following pairs of network can be combined to form a supernet?

- A 212.212.14.0
212.212.15.0
214.212.16.0
215.212.17.0

- B 194.212.4.0
194.212.5.0
194.212.6.0
194.212.7.0

Correct Option

Solution :

(b)
Group of networks can be combined into single supernet only if the network are continuous.
194.212.4.0
194.212.5.0
194.212.6.0
194.212.7.0
It form a supernet

- C 194.212.8.0
194.213.9.0
194.214.10.0
194.215.11.0

- D Both (b) and (c)

Your answer is Wrong

Q. 10

Solution Video

Have any Doubt ?



Which of the following is true?

A If LSP data is not in database, then data is stored and LSP packet is forwarded over all interfaces but not to the one on which it was received.

B IP does not include datagram acknowledgment.

C Both (a) and (b)

Correct Option

Solution :

(c)
Network layer provides best efforts delivery services which does not include any kind of acknowledgment.
Both (a) and (b) are correct.

D None of these

 QUESTION ANALYTICS



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ALL(33) CORRECT(8) INCORRECT(13) SKIPPED(12)

Q. 11

[▶ Solution Video](#)
[Have any Doubt ?](#)


In RSA algorithm the number of keys required to support both confidentiality and authentication are _____.

4

Correct Option

Solution :

4

 For RSA algorithm to support both confidentiality and authentication 2 key public key and private key for receiver and 2 key public key and private key for sender is required.
 Total 4 keys required.

Q. 12

[▶ Solution Video](#)
[Have any Doubt ?](#)

 In a RSA cryptosystem, sender public key is 47 and value of $p = 13$ and $q = 31$, value of private key of sender is _____.

23

Correct Option

Solution :

23

$$\begin{aligned}
 p &= 13, q = 31 \\
 n &= p \times q \\
 &= 13 \times 31 = 403 \\
 \phi(n) &= (p - 1) \times (q - 1) \\
 &= 12 \times 30 = 360 \\
 (d \times e) \bmod \phi(n) &= 1 \\
 47 \times e \bmod 360 &= 1 \\
 \text{Private key} &= 23 \\
 (47 \times 23) \bmod 360 &= 1
 \end{aligned}$$

Q. 13

[▶ Solution Video](#)
[Have any Doubt ?](#)

 A 20 Mbps satellite link has a propagation delay of 180 μs and size of frame is 150 B, the transmpter uses GoBack 5 ARQ scheme, the maximum data rate possible is _____ (Mbps). (Upto 2 decimal places)

14.28 [14.25 - 14.30]

Correct Option

Solution :
 14.28 [14.25 - 14.30]

$$\begin{aligned}
 \text{Transmission delay} &= \frac{150 \times 8}{20 \times 10^6} = 60 \mu\text{s} \\
 \text{Utilization} &= \frac{W}{1+2a} \\
 &= \frac{5}{1 + \frac{2 \times 180}{60}} = \frac{5}{1 + 6} = \frac{5}{7}
 \end{aligned}$$

Maximum possible data rate

$$= \frac{5}{7} \times 20 = 14.28 \text{ Mbps}$$

Your Answer is 3.22

QUESTION ANALYTICS


Q. 14

[▶ Solution Video](#)
[Have any Doubt ?](#)


Consider a system with 3 network connected via two router, network A has MTU of 800 bytes, network B has MTU of 400 bytes, network C has MTU of 800 bytes.


 Station A needs to send a segment of 680 bytes, total bytes received at network C _____.
 (Header size is 20B)

720

 Your answer is **Correct**720

Solution :

Total packet size is $680 + 20 = 700$ B is received at first network

Network B MTU = 400 ($380 + 20$)

$$\text{Number of fragments} = \frac{680}{380} = 1.8$$

$$1 \text{ fragment data} = (376 + 20)$$

$$2 \text{ fragment data} = (304 + 20)$$

$$\text{Total bytes received} = 376 + 20 + 304 + 20 = 720$$

QUESTION ANALYTICS**Q. 15****Solution Video****Have any Doubt ?**

For a class C network if IP address of a computer is $200.99.39.112$ and subnet mask is $255.255.255.224$ the decimal value of last octet of last host of sixth subnet is _____.

222**Correct Option****Solution :****222**

Since the subnet mask is $255.255.255.224$ that means the first 3 bits of subnet are reserved for subnet id and rest 5 are host id bits.

Hence, sixth subnet, last octet will be $[11011110]_2 = [222]_{10}$.

**Your Answer is 159****QUESTION ANALYTICS****Q. 16****Solution Video****Have any Doubt ?**

The minimum length (meter) of the cable for transmitting data at a rate of 20 Mbps in ethernet with a frame size of 1500 byte and signal speed of 30 km/sec is _____.

9**Correct Option****Solution :****9**

In ethernet IEEE 802.3 LAN

$$\begin{aligned} \text{Transmission time} &\geq 2 \times T_p \\ \frac{\text{Frame length}}{\text{Bandwidth}} &\geq 2 \times \frac{\text{Distance}}{\text{Speed}} \\ \frac{1500 \times 8}{20 \times 10^6} &\geq \frac{2 \times d}{30 \text{ km/sec}} \\ \frac{1500 \times 8 \times 30 \times 10^3}{20 \times 10^6 \times 2} &\geq d \\ d &= 9 \text{ meter} \end{aligned}$$

**Your Answer is 18****QUESTION ANALYTICS****Q. 17****Solution Video****Have any Doubt ?**

Consider the following statements:

- I. A single secret key can be used by the sender for multiple receiver.
 - II. Both RSA cryptosystem and RSA digital signature scheme uses same set of keys.
 - III. To provide security both AES and DES uses substitution.
- Which of the above statements is/are correct?

A I and II only**B II only****C I and III only****D III only****Correct Option****Solution :****(d)**

- I. Secret key is shared between two entities it can not be shared by another entity.
- II. RSA digital signature scheme uses public and private key of sender not receiver.
- III. Both AES and DES uses substitution.

QUESTION ANALYTICS**Q. 18****Solution Video****Have any Doubt ?**

An IP router implementing classless inter domain routing and it receives a packet with IP address 169.47.23.50
The router's routing table has the following entries.

Prefix	Interface
169.47.28.0/24	0
169.47.22.0/23	1
169.47.16.0/20	2
169.47.32.0/24	3

The interface on which this packet will be forwarded?

A 1

Your answer is Correct

Solution :

(a)
IP address 169.47.23.50
Interface 0 169.47.0001100.0
ANDING both will give 169.47.20.0 not matched
Interface 1 169.47.00010110.0
ANDING will give 169.47.22.0 it is matched
With interface 3 not matched.

Interface 2 will match as ANDING will give 169.47.16.0 but interface 1 has 23 bits network mask which is longer. Hence, packet will be forwarded to interface 1.

B 0

C 2

D 3

QUESTION ANALYTICS



Q. 19

Solution Video

Have any Doubt ?



In CRC checksum, data frame for transmission is 1101011011 and generator polynomial is given as $G(x) = x^4 + x + 1$, what is the encoded word sent from sender side?

A 11101101011011

Your answer is Wrong

B 11010110111110

Correct Option

Solution :
(b)

$$\begin{array}{r} \text{Data} \quad 1101011011 \\ \text{Divisor} = 10011 \\ \hline 11010110110000 \\ 10011 \\ \hline 01001110110000 \\ 10011 \\ \hline 0000010110000 \\ 10011 \\ \hline 00101000 \\ 10011 \\ \hline 001110 \end{array}$$

1110 is added to the frame 11010110111110 is send by the sender.

C 11010110110110

D 11010110111010

QUESTION ANALYTICS



Q. 20

Solution Video

Have any Doubt ?



Consider the following statements:

- I. A point to point protocol over ethernet is a network protocol for encapsulating ethernet frames inside PPP frames.
- II. High speed ethernet works on optical fiber.
- III. Semantic of the information transmitted in session layer.

Which of the above statements is/are correct?

A I and III only

B II only

Correct Option

Solution :

- (b)
- I. A point to point protocol over ethernet is a network protocol for encapsulating PPP frames inside ethernet frames I is not correct.
 - II. High speed ethernet works on optical fiber.
 - III. Semantic of the information transmitted in presentation layer.

C I and II only

D I only

 QUESTION ANALYTICS



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ALL(33)

CORRECT(8)

INCORRECT(13)

SKIPPED(12)

Q. 21

Solution Video

Have any Doubt ?



Which of the following is true about BGP (Border Gateway Protocol):

- BGP can provide coordination among multiple BGP system, within the autonomous system.
- BGP addresses reliability issues by itself, if does not depend on TCP.
- BGP does not conserve network bandwidth.

Which of the above statement(s) is/are true?

A I only

Correct Option

Solution :

- (a)
 BGP uses TCP for all communication so reliability issues are taken care by TCP.
 BGP does not pass full information in each update message, instead full information it is just passed on once and there after successive message only carries the incremental changes called delta, so network bandwidth is conserve. II is not correct statement.

B I and III only

C II and III only

D I and II only

QUESTION ANALYTICS



Q. 22

Solution Video

Have any Doubt ?



Which of the following is true?

A Digital signatures are verified using the sender's public key.

Correct Option

Solution :

- (a)
 Sender signs the document using private key and verified using public key.
 In TCP time out value are set according to appropriate algorithm.
 The maximum window size for selective repeat is $2^n - 1$.

B In TCP time out value is set to twice the propagation delay from the sender to the receives.

Your answer is Wrong

C The maximum window size for data transmission using selective repeat protocol with n bit sequence number is $2^n - 1$.

D Both (a) and (c)

QUESTION ANALYTICS



Q. 23

Solution Video

Have any Doubt ?



Consider the following statements:

- By the use of handshakes frames (RTS and CTS), the hidden station problem of IEEE 802.11 can be eliminated.
- Packet delivery in correct order is the functionality that must be implemented by network layer.
- Circuit switching is store and forward technique.

Which of the above statements is/are correct?

A I and II only

B I only

Correct Option

Solution :

- (b)
 I. RTS and CTS frame are used to eliminate hidden terminal problem.
 II. The functionality of network layer is source to destination delivery of packets.
 III. Circuit switching is not based on store and forward technique.

C I and III only

D II and III only

QUESTION ANALYTICS



Q. 24

[▶ Solution Video](#)[Have any Doubt ?](#)

Consider the following statements:

S_1 : When a strict routing has been specified by the source but can not be followed by the intermediate routers, it is not reported by ICMP.

S_2 : Suppose host A is sending a large file to host B over a TCP connection, the number of unacknowledged bytes that host A send can not exceeds the size of advertised receiver buffer.

Which of the above statements is/are not correct?

A S_1 only**B** S_2 only

Correct Option

Solution :

(b)

S_1 : When a strict routing has been specified by the source but not followed by the intermediate routers, it is reported by ICMP.

S_2 : TCP does not allow the host to send more data than receiver buffer requirement which restrict the data overflow.

S_2 is correct statement.

C Both S_1 and S_2 **D** Neither S_1 nor S_2

Your answer is Wrong

QUESTION ANALYTICS



Q. 25

[▶ Solution Video](#)[Have any Doubt ?](#)

Consider the following IP address 200.48.67.184 and subnet mask 255.255.255.240, what is the IP address of last host of subnet to which given IP address belongs?

A 200.48.67.192

Your answer is Wrong

B 200.48.67.190

Correct Option

Solution :

(b) IP address 200.48.67.184

It is class C address

Subnet mask = 255.255.255.240

4 bits of last octal is belongs to subnet bits

200.48.67.10111000
255.255.255.11110000
 └──
 └── Subnet bit

The last host of this IP address.

200.48.67.1011 1110
 └──
 └── Subnet bit
200.48.67.190 is last host IP address

C 200.48.67.255**D** 200.48.67.254

QUESTION ANALYTICS



Q. 26

[▶ Solution Video](#)[Have any Doubt ?](#)

Consider a network systems having 4 routers P, Q, R and S as shown below. Initially, the routers use a distance vector routing, and use the number of hops as the distance metric.



Initially, link P-Q was down, and all routers agree P is unreachable. The link P-Q comes back up. Let 'x' be the number of exchange needed by router P to stabilize its table having distance to all other router in the network. Assume the routers all exchange messages at the same instant. After reaching a steady-state the link P-Q goes down again. Let 'y' be the number of exchanges need for all routers to concluded router P is unreachable. What are the values of 'x', 'y' respectively?

A 3, 5**B** 5, 7**C** 4, 6**D** 4, 7

Your answer is Correct

Solution :

(d)

Q	R	S
∞	∞	∞
1	∞	∞
1	2	∞
1	2	3
1	2	3

Start
1 exchange
2 exchange
3 exchange
4 exchange

Value of 'x' is 4.

Q	R	S	
1	2	3	Start
3	2	3	1 exchange
3	4	3	2 exchange
5	4	5	3 exchange
5	6	5	4 exchange
7	6	7	5 exchange
7	8	7	6 exchange
8	8	8	7 exchange

Value of 'y' is 7.

QUESTION ANALYTICS

Q. 27

Solution Video

Have any Doubt ?



Assume host A having an IP address of 125.32.16.5 with a subnet mask of 255.255.255.128. Also, assume another host B, having an IP address of 125.32.16.120 with a subnet mask of 255.255.255.192. Which of the following is correct ?

- A 'A' assumes 'B' to be on the same network.

Your answer is Correct

Solution :

(a) IP address of 'A' = 125.32.16.5
Subnet mask of 'A' = 255.255.255.128
Subnet ID of A according to 'A' = 125.32.16.0
IP address of 'B' = 125.32.16.120
Subnet ID of B according to 'A' = 125.32.16.0
Hence 'A' assumes 'B' to be on the same network
IP address of 'B' = 125.32.16.120
Subnet mask of 'B' = 255.255.255.192
Subnet ID of B according to 'B' = 125.32.16.64
Subnet ID of A according to 'B' = 125.32.16.0
Hence 'B' assumes 'A' to be on different network.

- B 'B' assumes 'A' to be on the same network.

- C Both 'A' and 'B' assume each other to be on the same network.

- D Neither of the two assume themselves to be on the same network.

QUESTION ANALYTICS

Q. 28

Solution Video

Have any Doubt ?



A trunk of 4000 km long operates at 1.5 Mbps is used to transmit 32 bytes frame and uses sliding window protocol, if propagation speed is 4 μ sec/km, number of bits required for sequence number?

- A 7

- B 8

Correct Option

Solution :

(b) Propagation speed is 4 μ sec/km
Round trip time = $2 \times 4000 \times 4 \mu\text{sec} = 32 \text{ ms}$
In 1 sec $\rightarrow 1.5 \times 10^6$ bits
In 32 msec $\rightarrow 32 \times 10^{-3} \times 1.5 \times 10^6$
 $= 48000 \text{ bits are covered}$
Sequence number (2^K) = $\frac{48000 \text{ bit}}{32 \times 8 \text{ bit}} = 187.5$
 $2^K = 187.5$
 $K = \log(187.5) \approx 8$

- C 9

- D 10

QUESTION ANALYTICS

Q. 29

Solution Video

Have any Doubt ?



Consider a network with 23 bit in network part, an organization want to create 4 subnet of the network, the difference between the number of host addresses that can be used in the provided subnet and size of subnet mask (bits) _____.

- 101

Correct Option

Solution :

101
Network bit = 23
4 subnet are created so 2 bit is needed
Size of subnet mask = $23 + 2 = 25$ bit
Total permissible host = $(2^7 - 2) = 128 - 2 = 126$
Difference = $126 - 25 = 101$

 QUESTION ANALYTICS



Q. 30

 Solution Video

 Have any Doubt ?



Suppose 500 reservations stations are competing for the use of single slotted ALOHA channel, average 72 request are made per hour by a station, a slot is 250 μ sec, the approximate total channel load is _____ (%). (Upto 2 decimal places)

 0.25 [0.24 - 0.26]

Correct Option

Solution :

0.25 [0.24 - 0.26]

Request made by 500 stations

$$\begin{aligned} &= \frac{500 \times 72}{60 \times 60} \text{ Req/sec} \\ &= 10 \text{ Req/sec} \\ \text{Slot time} &= 250 \mu\text{sec} \\ 1 \text{ slot} &= 250 \times 10^{-6} \text{ sec} \\ \frac{1}{250 \times 10^{-6}} \text{ slot} &= 1 \text{ sec} \\ 4000 \text{ slot/sec} & \end{aligned}$$

Channel load = $\frac{\text{Number of req/sec}}{\text{Number of slot/sec}}$

$$= \frac{10}{4000} = \frac{1}{400} \times 100 = 0.25$$



Your Answer is .025

 QUESTION ANALYTICS



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Q. 31

Solution Video

Have any Doubt ?



Consider a message with 60×103 bits long, that is to be sent from a source to a destination, there are two router between source to destination.



Each of link in the path has bandwidth 1 Mbps, each packet is 1000 bit long, total time taken (in msec) to reach the last bit to the destination, propagation delay is 10 msec

92

Correct Option

Solution :

92

$$\text{Transmission time} = \frac{1000 \text{ b}}{1 \times 10^6 \text{ b/s}} = 1 \text{ ms}$$

Time when first packet will receive at destination = $1 \times 3 = 3 \text{ ms}$

$$3 + 10 \times 3 = 33$$

$$\text{Total packet} = \frac{60 \times 10^3}{10^3} = 60$$

$$\begin{aligned} \text{Total time taken} &= 33 + (59 \times 1) \\ &= 59 + 33 = 92 \text{ msec} \end{aligned}$$



Your Answer is 28

QUESTION ANALYTICS



Q. 32

Solution Video

Have any Doubt ?



Consider a TCP connection with congestion window size 40 KB, maximum segment size is 2 KB, if time taken by TCP connection to get 37 KB congestion window is 351 ms, round trip time of the connection is _____ (ms).

27

Correct Option

Solution :

27

Window size = 40 KB

$$\text{Threshold} = \frac{40}{2} = 20 \text{ KB}$$

Maximum segment size = 2 KB

$2 \rightarrow 4 \rightarrow 8 \rightarrow 16 \rightarrow 20 \rightarrow 22 \rightarrow 24 \rightarrow 26 \rightarrow 28 \rightarrow 30 \rightarrow 32 \rightarrow 34 \rightarrow 36 \rightarrow 37$

Time taken to reach 37 KB is 351 = Number of segment \times RTT

$$351 = 13 \times \text{RTT}$$

$$\text{RTT} = 27 \text{ ms}$$



Your Answer is 4563

QUESTION ANALYTICS



Q. 33

Solution Video

Have any Doubt ?



Consider an ethernet with length of the cable is 1800 meter and speed of the signal cable is 3×10^8 m/s, transmission time is 45 μ sec, the (%) of time channel remains idle _____. (Upto 2 decimal place)

46.0 [46.0 - 46.3]

Your answer is Correct46

Solution :

46.0 [46.0 - 46.3]

Transmission delay = 45 μ sec

$$\text{Propagation time} = \frac{1800}{3 \times 10^8} = 6 \mu\text{sec}$$

$$\text{Efficiency} = \frac{1}{1 + 6.4a}$$

$$a = \frac{6}{45} = 0.133$$

$$= \frac{1}{1 + 0.133 \times 6.4} = 53.96\%$$

$$\Rightarrow \text{Idle} = 46.03$$

QUESTION ANALYTICS



