2 Computer Networks (201)

Concept of layering. LAN technologies (Ethernet).Flow and error control techniques, Swithing. IPv4/ IPv6, Routers and routing algorithms (distance vector, link state). TCP/UDP and Sockets, Congestion control. Application layer protocols (DNS, SMTP, POP, FTP, HTTP). Basics of Wi-Fi. Network security: authentication, basics of public key and private key cryptography, digital signatures and certificates, Firewalls.

2.1 Application Layer Protocols (8)

2.1.1 Application Layer Protocols: GATE2005-IT-25 https://gateoverflow.in/3770

Consider the three commands : PROMPT, HEAD and RCPT.
Which of the following options indicate a correct association of these commands with protocols where these are used?

A. HTTP, SMTP, FTP
B. FTP, HTTP, SMTP
C. HTTP, FTP, SMTP
D. SMTP, HTTP, FTP

gate2005-it computer-networks application-layer-protocols normal

2.1.2 Application Layer Protocols: GATE2006-IT-18 https://gateoverflow.in/3557

HELO and PORT, respectively, are commands from the protocols:

A. FTP and HTTP B. TELNET and POP3 C. HTTP and TELNET D. SMTP and FTP

gate2006-it computer-networks application-layer-protocols normal

2.1.3 Application Layer Protocols: GATE2008-14, ISRO2016-74 https://gateoverflow.in/412

What is the maximum size of data that the application layer can pass on to the TCP layer below?

A. Any size
B. 2^{16} bytes - size of TCP header
C. 2^{16} bytes
D. 1500 bytes

gate2008 easy computer-networks application-layer-protocols isro2016

2.1.4 Application Layer Protocols: GATE2008-IT-20 https://gateoverflow.in/3280

Provide the best matching between the entries in the two columns given in the table below:

I.	Proxy Server	a.	Firewall
II.	Kazaa, DC++	b.	Caching
III.	Slip	c.	P2P
IV.	DNS	d.	PPP

A. I-a, II-d, III-c, IV-b
B. I-b, II-d, III-c, IV-a
C. I-a, II-c, III-d, IV-b
D. I-b, II-c, III-d, IV-a

gate2008-it computer-networks normal application-layer-protocols

2.1.5 Application Layer Protocols: GATE2011-4 https://gateoverflow.in/2106

Consider the different activities related to email.

- $m1$: Send an email from mail client to mail server
- $m2$: Download an email from mailbox server to a mail client
- $m3$: Checking email in a web browser

Which is the application level protocol used in each activity?

A. $m1$: HTTP $m2$: SMTP $m3$: POP
B. $m1$: SMTP $m2$: FTP $m3$: HTTP
C. $m1$: SMTP $m2$: POP $m3$: HTTP
D. $m1$: POP $m2$: SMTP $m3$: IMAP

gate2011 computer-networks application-layer-protocols easy

2.1.6 Application Layer Protocols: GATE2012-10

https://gateoverflow.in/42

The protocol data unit (PDU) for the application layer in the Internet stack is:

A. Segment B. Datagram C. Message D. Frame

gate2012 computer-networks application-layer-protocols easy

2.1.7 Application Layer Protocols: GATE2016-1-25

https://gateoverflow.in/39628

Which of the following is/are example(s) of stateful application layer protocol?

i. HTTP
ii. FTP
iii. TCP
iv. POP3

HTTP and TCP is stateless protocol

A. (i) and (ii) only B. (ii) and (iii) only C. (ii) and (iv) only D. (iv) only

gate2016-1 computer-networks application-layer-protocols normal

2.1.8 Application Layer Protocols: GATE2019-16

https://gateoverflow.in/302832

Which of the following protocol pairs can be used to send and retrieve e-mails (in that order)?

A. IMAP POP3 B. SMTP, POP3 C. SMTP MIME D. IMAP, SMTP

gate2019 computer-networks application-layer-protocols

2.2 Bit Stuffing (1)

2.2.1 Bit Stuffing: GATE2014-3-24

https://gateoverflow.in/2058

A bit-stuffing based framing protocol uses an 8-bit delimiter pattern of 01111110.
If the output bit-string after stuffing is 01111100101, then the input bit-string is:

A. 0111110100 B. 0111110101 C. 0111111101 D. 0111111111

gate2014-3 computer-networks bit-stuffing

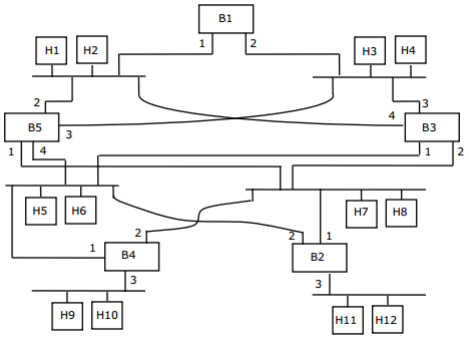
2.3 Bridges (2)

2.3.1 Bridges: GATE2006-82

https://gateoverflow.in/1855

Consider the diagram shown below where a number of LANs are connected by (transparent) bridges. In order to avoid packets looping through circuits in the graph, the bridges organize themselves in a spanning tree. First, the root bridge is identified as the bridge with the least serial number. Next, the root sends out (one or more) data units to enable the setting up of the spanning tree of shortest paths from the root bridge to each bridge.

Each bridge identifies a port (the root port) through which it will forward frames to the root bridge. Port conflicts are always resolved in favour of the port with the lower index value. When there is a possibility of multiple bridges forwarding to the same LAN (but not through the root port), ties are broken as follows: bridges closest to the root get preference and between such bridges, the one with the lowest serial number is preferred.



DFS traversal will give answer as A

B1 B5 B3 B4 B2

For the given connection of LANs by bridges, which one of the following choices represents the depth first traversal of the spanning tree of bridges?

A. B1, B5, B3, B4, B2
B. B1, B3, B5, B2, B4
C. B1, B5, B2, B3, B4
D. B1, B3, B4, B5, B2

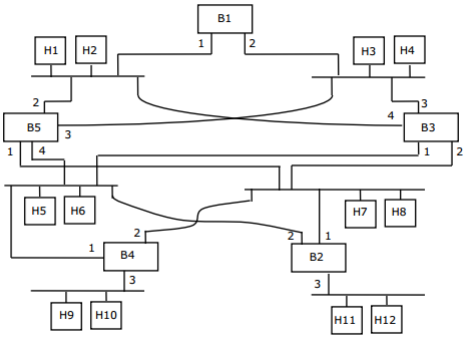
gate2006 computer-networks bridges normal

2.3.2 Bridges: GATE2006-83

https://gateoverflow.in/79790

Consider the diagram shown below where a number of LANs are connected by (transparent) bridges. In order to avoid packets looping through circuits in the graph, the bridges organize themselves in a spanning tree. First, the root bridge is identified as the bridge with the least serial number. Next, the root sends out (one or more) data units to enable the setting up of the spanning tree of shortest paths from the root bridge to each bridge.

Each bridge identifies a port (the root port) through which it will forward frames to the root bridge. Port conflicts are always resolved in favour of the port with the lower index value. When there is a possibility of multiple bridges forwarding to the same LAN (but not through the root port), ties are broken as follows: bridges closest to the root get preference and between such bridges, the one with the lowest serial number is preferred.



Consider the spanning tree $B1, B5, B3, B4, B2$ for the given connection of LANs by bridges, that represents the depth first traversal of the spanning tree of bridges. Let host $H1$ send out a broadcast ping packet. Which of the following options represents the correct forwarding table on $B3$?

a.

Hosts	Port
H1, H2, H3, H4	3
H5, H6, H9, H10	1
H7, H8, H11, H12	2

b.

Hosts	Port
H1, H2	4
H3, H4	3
H5, H6	1
H7, H8, H9, H10, H11, H12	2

c.

Hosts	Port
H3, H4	3
H5, H6, H9, H10	1
H1, H2	4
H7, H8, H11, H12	2

d.

Hosts	Port
H1, H2, H3, H4	3
H5, H7, H9, H10	1
H7, H8, H11, H12	4

gate2006 computer-networks bridges normal

2.4 Communication (3)

2.4.1 Communication: GATE2007-IT-62

https://gateoverflow.in/3506

Let us consider a statistical time division multiplexing of packets. The number of sources is 10. In a time unit, a source transmits a packet of 1000 bits. The number of sources sending data for the first 20 time units is $6, 9, 3, 7, 2, 2, 2, 3, 4, 6, 1, 10, 7, 5, 8, 3, 6, 2, 9, 5$ respectively. The output capacity of multiplexer is 5000 bits per time unit. Then the average number of backlogged of packets per time unit during the given period is

A. 5
B. 4.45
C. 3.45
D. 0

gate2007-it computer-networks communication normal

2.4.2 Communication: GATE2007-IT-64

https://gateoverflow.in/3509

A broadcast channel has 10 nodes and total capacity of 10 Mbps. It uses polling for medium access. Once a node finishes transmission, there is a polling delay of 80 µs to poll the next node. Whenever a node is polled, it is allowed to transmit a maximum of 1000 bytes. The maximum throughput of the broadcast channel is:

A. 1 Mbps
B. $100/11$ Mbps
C. 10 Mbps
D. 100 Mbps

gate2007-it computer-networks communication normal

2.4.3 Communication: GATE2012-44

https://gateoverflow.in/2153

Consider a source computer (S) transmitting a file of size 10^6 bits to a destination computer (D) over a network of two routers $(R_1$ and $R_2)$ and three links $(L_1, L_2,$ and $L_3)$. L_1 connects S to R_1; L_2 connects R_1 to R_2; and L_3 connects R_2 to D. Let each link be of length 100 km. Assume signals travel over each link at a speed of 10^8 meters per second. Assume that the link bandwidth on each link is 1 Mbps. Let the file be broken down into 1000 packets each of size 1000 bits. Find the total sum of transmission and propagation delays in transmitting the file from S to D?

A. 1005 ms B. 1010 ms C. 3000 ms D. 3003 ms

gate2012 computer-networks communication normal

2.5 Congestion Control (7)

2.5.1 Congestion Control: GATE2005-IT-73

https://gateoverflow.in/3836

On a TCP connection, current congestion window size is Congestion Window = 4 KB. The window size advertised by the receiver is Advertise Window = 6 KB. The last byte sent by the sender is LastByteSent = 10240 and the last byte acknowledged by the receiver is LastByteAcked = 8192. The current window size at the sender is:

A. 2048 bytes B. 4096 bytes C. 6144 bytes D. 8192 bytes

gate2005-it computer-networks congestion-control normal

2.5.2 Congestion Control: GATE2008-56

https://gateoverflow.in/479

In the slow start phase of the TCP congestion algorithm, the size of the congestion window:

A. does not increase
B. increase linearly
C. increases quadratically
D. increases exponentially

gate2008 computer-networks congestion-control normal

2.5.3 Congestion Control: GATE2012-45

https://gateoverflow.in/2156

Consider an instance of TCP's Additive Increase Multiplicative Decrease (AIMD) algorithm where the window size at the start of the slow start phase is 2 MSS and the threshold at the start of the first transmission is 8 MSS. Assume that a timeout occurs during the fifth transmission. Find the congestion window size at the end of the tenth transmission.

A. 8 MSS B. 14 MSS C. 7 MSS D. 12 MSS

gate2012 computer-networks congestion-control normal

2.5.4 Congestion Control: GATE2014-1-27

https://gateoverflow.in/1794

Let the size of congestion window of a TCP connection be 32 KB when a timeout occurs. The round trip time of the connection is 100 msec and the maximum segment size used is 2 KB. The time taken **(in msec)** by the TCP connection to get back to 32 KB congestion window is _____.

Suppose we have a slow start ⇒2KB|4KB|8KB|16KB (As the threshold is reached, Additive increase starts)
18KB|20KB|22KB|24KB|26KB|28KB|30KB|32KB;
Here | (vertical line) is representing RTT so the total number of vertical lines is 11×100ms=1100msec and so this is the answer.

gate2014-1 computer-networks tcp congestion-control numerical-answers normal

2.5.5 Congestion Control: GATE2015-1-29

https://gateoverflow.in/8253

Consider a LAN with four nodes $S_1, S_2, S_3,$ and S_4. Time is divided into fixed-size slots, and a node can begin its transmission only at the beginning of a slot. A collision is said to have occurred if more than one node transmits in the same slot. The probabilities of generation of a frame in a time slot by $S_1, S_2, S_3,$ and S_4 are $0.1, 0.2, 0.3$ and 0.4 respectively. The probability of sending a frame in the first slot without any collision by any of these four stations is_____.

gate2015-1 computer-networks normal numerical-answers congestion-control

2.5.6 Congestion Control: GATE2018-14

https://gateoverflow.in/204088

Consider the following statements regarding the slow start phase of the TCP congestion control algorithm. Note that *cwnd* stands for the TCP congestion window and MSS window denotes the Maximum Segments Size:

i. The *cwnd* increases by 2 MSS on every successful acknowledgment
ii. The *cwnd* approximately doubles on every successful acknowledgment

iii. The *cwnd* increases by 1 MSS every round trip time
iv. The *cwnd* approximately doubles every round trip time

Which one of the following is correct?

A. Only (ii) and (iii) are true
B. Only (i) and (iii) are true
C. Only (iv) is true
D. Only (i) and (iv) are true

gate2018 computer-networks tcp congestion-control normal

2.5.7 Congestion Control: GATE2018-55

https://gateoverflow.in/204130

Consider a simple communication system where multiple nodes are connected by a shared broadcast medium (like Ethernet or wireless). The nodes in the system use the following carrier-sense based medium access protocol. A node that receives a packet to transmit will carrier-sense the medium for 5 units of time. If the node does not detect any other transmission, it starts transmitting its packet in the next time unit. If the node detects another transmission, it waits until this other transmission finishes, and then begins to carrier-sense for 5 time units again. Once they start to transmit, nodes do not perform any collision detection and continue transmission even if a collision occurs. All transmissions last for 20 units of time. Assume that the transmission signal travels at the speed of 10 meters per unit time in the medium.

Assume that the system has two nodes P and Q, located at a distance d meters from each other. P start transmitting a packet at time $t = 0$ after successfully completing its carrier-sense phase. Node Q has a packet to transmit at time $t = 0$ and begins to carrier-sense the medium.

The maximum distance d (in meters, rounded to the closest integer) that allows Q to successfully avoid a collision between its proposed transmission and P's ongoing transmission is _____.

gate2018 computer-networks congestion-control numerical-answers

2.6 Crc Polynomial (3)

2.6.1 Crc Polynomial: GATE2005-IT-78

https://gateoverflow.in/3842

Consider the following message $M = 1010001101$. The cyclic redundancy check (CRC) for this message using the divisor polynomial $x^5 + x^4 + x^2 + 1$ is :

A. 01110 B. 01011 C. 10101 D. 10110

gate2005-it computer-networks crc-polynomial normal

2.6.2 Crc Polynomial: GATE2007-68, ISRO2016-73

https://gateoverflow.in/1266

The message 11001001 is to be transmitted using the CRC polynomial $x^3 + 1$ to protect it from errors. The message that should be transmitted is:

A. 11001001000 B. 11001001011 C. 11001010 D. 110010010011

gate2007 computer-networks error-detection crc-polynomial normal isro2016

2.6.3 Crc Polynomial: GATE2017-1-32

https://gateoverflow.in/118313

A computer network uses polynomials over $GF(2)$ for error checking with 8 bits as information bits and uses $x^3 + x + 1$ as the generator polynomial to generate the check bits. In this network, the message 01011011 is transmitted as:

A. 01011011010 B. 01011011011 C. 01011011101 D. 01011011100

gate2017-1 computer-networks crc-polynomial normal

2.7 Cryptography (2)

2.7.1 Cryptography: GATE2016-2-23

https://gateoverflow.in/39555

Anarkali digitally signs a message and sends it to Salim. Verification of the signature by Salim requires.

A. Anarkali's public key.
B. Salim's public key.
C. Salim's private key.
D. Anarkali's private key.

gate2016-2 computer-networks network-security cryptography easy

2.7.2 Cryptography: GATE2017-1-15

https://gateoverflow.in/118295

A sender S sends a message m to receiver R, which is digitally signed by S with its private key. In this scenario, one or more of the following security violations can take place.

I. S can launch a birthday attack to replace m with a fraudulent message
II. A third party attacker can launch a birthday attack to replace m with a fraudulent message
III. R can launch a birthday attack to replace m with a fraudulent message

Which of the following are possible security violations?

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

gate2017-1 computer-networks cryptography normal

2.8 Csma Cd (5)

2.8.1 Csma Cd: GATE2005-IT-27

https://gateoverflow.in/3773

Which of the following statements is TRUE about CSMA/CD:

A. IEEE 802.11 wireless LAN runs CSMA/CD protocol
B. Ethernet is not based on CSMA/CD protocol
C. CSMA/CD is not suitable for a high propagation delay network like satellite network
D. There is no contention in a CSMA/CD network

gate2005-it computer-networks congestion-control csma-cd normal

2.8.2 Csma Cd: GATE2005-IT-71

https://gateoverflow.in/3834

A network with CSMA/CD protocol in the MAC layer is running at 1Gbps over a 1km cable with no repeaters. The signal speed in the cable is $2 \times 10^8 \text{m/sec}$. The minimum frame size for this network should be:

A. 10000bits B. 10000bytes C. 5000 bits D. 5000bytes

gate2005-it computer-networks congestion-control csma-cd normal

2.8.3 Csma Cd: GATE2008-IT-65

https://gateoverflow.in/3376

The minimum frame size required for a CSMA/CD based computer network running at 1Gbps on a $200m$ cable with a link speed of $2 \times 10^8 \text{m/sec}$ is:

A. 125bytes B. 250bytes C. 500bytes D. None of the above

gate2008-it computer-networks csma-cd normal

2.8.4 Csma Cd: GATE2015-3-6

https://gateoverflow.in/8400

Consider a CSMA/CD network that transmits data at a rate of $100\ Mbps$ ($10^8\ bits$ per second) over a $1\ km$ (kilometre) cable with no repeaters. If the minimum frame size required for this network is $1250\ bytes$, What is the signal speed (km/sec) in the cable?

A. 8000 B. 10000 C. 16000 D. 20000

gate2015-3 computer-networks congestion-control csma-cd normal

2.8.5 Csma Cd: GATE2016-2-53

https://gateoverflow.in/39589

A network has a data transmission bandwidth of 20×10^6 bits per second.
It uses **CSMA/CD** in the **MAC** layer. The maximum signal propagation time from one node to another node is 40 microseconds.
The minimum size of a frame in the network is _____ bytes.

gate2016-2 computer-networks csma-cd numerical-answers normal

2.9 Distance Vector Routing (6)

2.9.1 Distance Vector Routing: GATE2005-IT-29

https://gateoverflow.in/3775

Count to infinity is a problem associated with:

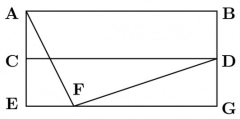
A. link state routing protocol.
B. distance vector routing protocol
C. DNS while resolving host name
D. TCP for congestion control

gate2005-it computer-networks routing distance-vector-routing normal

2.9.2 Distance Vector Routing: GATE2007-IT-60

https://gateoverflow.in/3504

For the network given in the figure below, the routing tables of the four nodes A, E, D and G are shown. Suppose that F has estimated its delay to its neighbors, A, E, D and G as 8, 10, 12 and 6 msecs respectively and updates its routing table using distance vector routing technique.



Routing Table of A

A	0
B	40
C	14
D	17
E	21
F	9
G	24

Routing Table of D

A	20
B	8
C	30
D	0
E	14
F	7
G	22

Routing Table of E

A	24
B	27
C	7
D	20
E	0
F	11
G	22

Routing Table of G

A	21
B	24
C	22
D	19
E	22
F	10
G	0

A.

A	8
B	20
C	17
D	12
E	10
F	0
G	6

B.

A	21
B	8
C	7
D	19
E	14
F	0
G	22

C.

A	8
B	20
C	17
D	12
E	10
F	16
G	6

D.

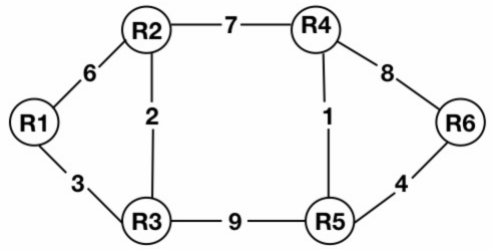
A	8
B	8
C	7
D	12
E	10
F	0
G	6

gate2007-it computer-networks distance-vector-routing normal

2.9.3 Distance Vector Routing: GATE2010-54

https://gateoverflow.in/2362

Consider a network with 6 routers $R1$ to $R6$ 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 neighbor with the weight of the respective connecting link. After all the routing tables stabilize, how many links in the network will never be used for carrying any data?

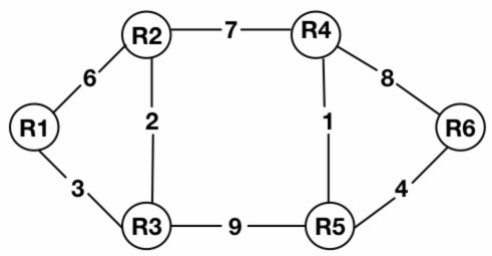
A. 4 B. 3 C. 2 D. 1

gate2010 computer-networks routing distance-vector-routing normal

2.9.4 Distance Vector Routing: GATE2010-55

https://gateoverflow.in/43326

Consider a network with 6 routers $R1$ to $R6$ connected with links having weights as shown in the following diagram.



Suppose the weights of all unused links are changed to 2 and the distance vector algorithm is used again until all routing tables stabilize. How many links will now remain unused?

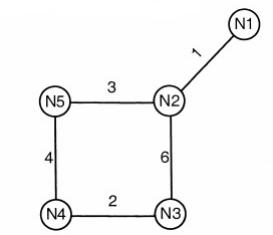
A. 0 B. 1 C. 2 D. 3

gate2010 computer-networks routing distance-vector-routing normal

2.9.5 Distance Vector Routing: GATE2011-52

https://gateoverflow.in/2160

Consider a network with five nodes, $N1$ to $N5$, as shown as below.



The network uses a Distance Vector Routing protocol. Once the routes have been stabilized, the distance vectors at different nodes are as follows.

N1: $(0, 1, 7, 8, 4)$

N2: $(1, 0, 6, 7, 3)$

N3: $(7, 6, 0, 2, 6)$

N4: $(8, 7, 2, 0, 4)$

N5: $(4, 3, 6, 4, 0)$

Each distance vector is the distance of the best known path at that instance to nodes, $N1$ to $N5$, where the distance to itself is 0. Also, all links are symmetric and the cost is identical in both directions. In each round, all nodes exchange their distance vectors with their respective neighbors. Then all nodes update their distance vectors. In between two rounds, any change in cost of a link will cause the two incident nodes to change only that entry in their distance vectors.

The cost of link $N2 - N3$ reduces to 2 (in both directions). After the next round of updates, what will be the new distance vector at node, $N3$?

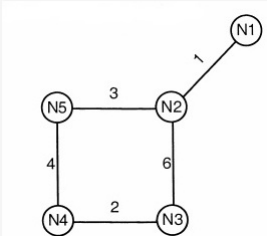
A. $(3, 2, 0, 2, 5)$ B. $(3, 2, 0, 2, 6)$
C. $(7, 2, 0, 2, 5)$ D. $(7, 2, 0, 2, 6)$

gate2011 computer-networks routing distance-vector-routing normal

2.9.6 Distance Vector Routing: GATE2011-53

https://gateoverflow.in/43317

Consider a network with five nodes, $N1$ to $N5$, as shown as below.



The network uses a Distance Vector Routing protocol. Once the routes have been stabilized, the distance vectors at different

nodes are as follows.

N1: $(0, 1, 7, 8, 4)$

N2: $(1, 0, 6, 7, 3)$

N3: $(7, 6, 0, 2, 6)$

N4: $(8, 7, 2, 0, 4)$

N5: $(4, 3, 6, 4, 0)$

Each distance vector is the distance of the best known path at that instance to nodes, $N1 to N5$, where the distance to itself is 0. Also, all links are symmetric and the cost is identical in both directions. In each round, all nodes exchange their distance vectors with their respective neighbors. Then all nodes update their distance vectors. In between two rounds, any change in cost of a link will cause the two incident nodes to change only that entry in their distance vectors.

The cost of link $N2 - N3$ reduces to 2 (in both directions). After the next round of updates, the link $N1 - N2$ goes down. $N2$ will reflect this change immediately in its distance vector as cost, ∞. After the **NEXT ROUND** of update, what will be the cost to $N1$ in the distance vector of $N3$?

A. 3 B. 9 C. 10 D. ∞

gate2011 computer-networks routing distance-vector-routing normal

2.10 Dns (1)

2.10.1 Dns: GATE2005-IT-77

https://gateoverflow.in/3840

Assume that "host1.mydomain.dom" has an IP address of $145.128.16.8$. Which of the following options would be most appropriate as a subsequence of steps in performing the reverse lookup of $145.128.16.8$? In the following options "NS" is an abbreviation of "nameserver".

A. Query a NS for the root domain and then NS for the "dom" domains
B. Directly query a NS for "dom" and then a NS for "mydomain.dom" domains
C. Query a NS for in-addr.arpa and then a NS for 128.145.in-addr.arpa domains
D. Directly query a NS for 145.in-addr.arpa and then a NS for 128.145.in-addr.arpa domains

gate2005-it computer-networks normal dns

2.11 Encoding (1)

2.11.1 Encoding: GATE2006-IT-65

https://gateoverflow.in/3609

In the $4B/5B$ encoding scheme, every 4 bits of data are encoded in a 5-bit codeword.
It is required that the codewords have at most 1 leading and at most 1 trailing zero.
How many are such codewords possible?

A. 14 B. 16 C. 18 D. 20

gate2006-it computer-networks encoding permutation-and-combination normal

2.12 Error Detection (6)

2.12.1 Error Detection: GATE1992-01,ii

https://gateoverflow.in/546

Consider a 3-bit error detection and 1-bit error correction hamming code for 4-bit data. The extra parity bits required would be ___ and the 3-bit error detection is possible because the code has a minimum distance of ____.

gate1992 computer-networks error-detection normal

2.12.2 Error Detection: GATE1995-1.12

https://gateoverflow.in/2599

What is the distance of the following code 000000, 010101, 000111, 011001, 111111?

A. 2 B. 3 C. 4 D. 1

minimum number of differnce in bit

gate1995 computer-networks error-detection normal

2.12.3 Error Detection: GATE2005-IT-74

https://gateoverflow.in/3837

In a communication network, a packet of length L bits takes link L_1 with a probability of p_1 or link L_2 with a

probability of p_2. Link L_1 and L_2 have bit error probability of b_1 and b_2 respectively. The probability that the packet will be received without error via either L_1 or L_2 is

A. $(1-b_1)^L p_1 + (1-b_2)^L p_2$
B. $[1-(b_1+b_2)^L]p_1 p_2$
C. $(1-b_1)^L (1-b_2)^L p_1 p_2$
D. $1-(b_1^L p_1 + b_2^L p_2)$

gate2005-it computer-networks error-detection probability normal

2.12.4 Error Detection: GATE2007-IT-43

https://gateoverflow.in/3478

An error correcting code has the following code words: $00000000, 00001111, 01010101, 10101010, 11110000$. What is the maximum number of bit errors that can be corrected?

A. 0 B. 1 C. 2 D. 3

gate2007-it computer-networks error-detection normal

2.12.5 Error Detection: GATE2008-IT-66

https://gateoverflow.in/3380

Data transmitted on a link uses the following $2D$ parity scheme for error detection:
Each sequence of 28 bits is arranged in a 4×7 matrix (rows r_0 through r_3, and columns d_7 through d_1) and is padded with a column d_0 and row r_4 of parity bits computed using the Even parity scheme. Each bit of column d_0 (respectively, row r_4) gives the parity of the corresponding row (respectively, column). These 40 bits are transmitted over the data link.

	$\mathbf{d_7}$	$\mathbf{d_6}$	$\mathbf{d_5}$	$\mathbf{d_4}$	$\mathbf{d_3}$	$\mathbf{d_2}$	$\mathbf{d_1}$	$\mathbf{d_0}$
$\mathbf{r_0}$	0	1	0	1	0	0	1	**1**
$\mathbf{r_1}$	1	1	0	0	1	1	1	**0**
$\mathbf{r_2}$	0	0	0	1	0	1	0	**0**
$\mathbf{r_3}$	0	1	1	0	1	0	1	**0**
$\mathbf{r_4}$	**1**	**1**	**0**	**0**	**0**	**1**	**1**	**0**

The table shows data received by a receiver and has n corrupted bits. What is the minimum possible value of n?

A. 1 B. 2 C. 3 D. 4

gate2008-it computer-networks normal error-detection

2.12.6 Error Detection: GATE2009-48

https://gateoverflow.in/1334

Let $G(x)$ be the generator polynomial used for CRC checking. What is the condition that should be satisfied by $G(x)$ to detect odd number of bits in error?

A. $G(x)$ contains more than two terms
B. $G(x)$ does not divide $1+x^k$, for any k not exceeding the frame length
C. $1+x$ is a factor of $G(x)$
D. $G(x)$ has an odd number of terms.

gate2009 computer-networks error-detection normal

2.13 Ethernet (4)

2.13.1 Ethernet: GATE2004-54

https://gateoverflow.in/1050

A and B are the only two stations on an Ethernet. Each has a steady queue of frames to send. Both A and B attempt to transmit a frame, collide, and A wins the first backoff race. At the end of this successful transmission by A, both A and B attempt to transmit and collide. The probability that A wins the second backoff race is:

A. 0.5 B. 0.625 C. 0.75 D. 1.0

gate2004 computer-networks ethernet probability normal

2.13.2 Ethernet: GATE2006-IT-19

https://gateoverflow.in/3558

Which of the following statements is TRUE?

A. Both Ethernet frame and IP packet include checksum fields

B. Ethernet frame includes a checksum field and IP packet includes a CRC field
C. Ethernet frame includes a CRC field and IP packet includes a checksum field
D. Both Ethernet frame and IP packet include CRC fields

gate2006-it computer-networks normal ethernet

2.13.3 Ethernet: GATE2013-36

https://gateoverflow.in/1547

Determine the maximum length of the cable (in km) for transmitting data at a rate of 500 Mbps in an Ethernet LAN with frames of size $10,000$ bits. Assume the signal speed in the cable to be $2,00,000$ km/s.

A. 1
B. 2
C. 2.5
D. 5

gate2013 computer-networks ethernet normal

2.13.4 Ethernet: GATE2016-2-24

https://gateoverflow.in/39543

In an Ethernet local area network, which one of the following statements is **TRUE**?

A. A station stops to sense the channel once it starts transmitting a frame.
B. The purpose of the jamming signal is to pad the frames that are smaller than the minimum frame size.
C. A station continues to transmit the packet even after the collision is detected.
D. The exponential back off mechanism reduces the probability of collision on retransmissions.

gate2016-2 computer-networks ethernet normal

2.14 Firewall (1)

2.14.1 Firewall: GATE2011-2

https://gateoverflow.in/2104

A layer-4 firewall (a device that can look at all protocol headers up to the transport layer) **CANNOT**

A. block entire HTTP traffic during $9:00PM$ and $5:00AM$
B. block all ICMP traffic
C. stop incoming traffic from specific IP address but allow outgoing traffic to the same IP address
D. block TCP traffic from a specific user on a multi-user system during $9:00PM$ to $5:00AM$

gate2011 computer-networks network-security firewall normal

2.15 Fragmentation (1)

2.15.1 Fragmentation: GATE2018-54

https://gateoverflow.in/204129

Consider an IP packet with a length of $4,500$ $bytes$ that includes a $20-byte$ IPv4 header ans $40-byte$ TCP header. The packet is forwarded to an IPv4 router that supports a Maximum Transmission Unit (MTU) of 600 $bytes$. Assume that the length of the IP header in all the outgoing fragments of this packet is 20 $bytes$. Assume that the fragmentation offset value stored in the first fragment is 0.

The fragmentation offset value stored in the third fragment is _____. 144

gate2018 computer-networks fragmentation ipv4 numerical-answers

2.16 Hamming Code (1)

2.16.1 Hamming Code: GATE1994-9

https://gateoverflow.in/2505

Following 7 bit single error correcting hamming coded message is received.

7	6	5	4	3	2	1	bit No.
1	0	0	0	1	1	0	X

Determine if the message is correct (assuming that at most 1 bit could be corrupted).
If the message contains an error find the bit which is erroneous and gives correct message.

gate1994 computer-networks error-detection hamming-code normal

2.17 Icmp (1)

2.17.1 Icmp: GATE2005-IT-26

https://gateoverflow.in/3772

Traceroute reports a possible route that is taken by packets moving from some host A to some other host B. Which of the following options represents the technique used by traceroute to identify these hosts:

A. By progressively querying routers about the next router on the path to B using ICMP packets, starting with the first router
B. By requiring each router to append the address to the ICMP packet as it is forwarded to B. The list of all routers en-route to B is returned by B in an ICMP reply packet
C. By ensuring that an ICMP reply packet is returned to A by each router en-route to B, in the ascending order of their hop distance from A
D. By locally computing the shortest path from A to B

gate2005-it computer-networks icmp application-layer-protocols normal

2.18 Ip Packet (8)

2.18.1 Ip Packet: GATE2004-IT-86

https://gateoverflow.in/3730

In the TCP/IP protocol suite, which one of the following is NOT part of the IP header?

A. Fragment Offset
B. Source IP address
C. Destination IP address
D. Destination port number

gate2004-it computer-networks ip-packet normal

2.18.2 Ip Packet: GATE2006-5

https://gateoverflow.in/884

For which one of the following reasons does internet protocol(IP) use the time-to-live(TTL) field in IP datagram header?

A. Ensure packets reach destination within that time
B. Discard packets that reach later than that time
C. Prevent packets from looping indefinitely
D. Limit the time for which a packet gets queued in intermediate routers

gate2006 computer-networks ipv4 ip-packet easy

2.18.3 Ip Packet: GATE2010-15. PGEE 2018

https://gateoverflow.in/2188

One of the header fields in an IP datagram is the Time-to-Live (TTL) field. Which of the following statements best explains the need for this field?

A. It can be used to prioritize packets.
B. It can be used to reduce delays.
C. It can be used to optimize throughput.
D. It can be used to prevent packet looping.

gate2010 computer-networks ip-packet easy

2.18.4 Ip Packet: GATE2014-3-25

https://gateoverflow.in/2059

Host A (on TCP/IP v4 network A) sends an IP datagram D to host B (also on TCP/IP v4 network B). Assume that no error occurred during the transmission of D. When D reaches B, which of the following IP header field(s) may be different from that of the original datagram D?

i. TTL
ii. Checksum
iii. Fragment Offset

A. i only B. i and ii only C. ii and iii only D. i, ii and iii

gate2014-3 computer-networks ip-packet normal

2.18.5 Ip Packet: GATE2014-3-28

https://gateoverflow.in/2062

An IP router with a Maximum Transmission Unit (MTU) of 1500 bytes has received an IP packet of size 4404 bytes with an IP header of length 20 bytes. The values of the relevant fields in the header of the third IP fragment generated by the router for this packet are:

A. MF bit: 0, Datagram Length:1444; Offset: 370
B. MF bit: 1, Datagram Length: 1424; Offset: 185
C. MF bit: 1, Datagram Length: 1500; Offset: 370
D. MF bit: 0, Datagram Length: 1424; Offset: 2960

gate2014-3 computer-networks ip-packet normal

2.18.6 Ip Packet: GATE2015-1-22

https://gateoverflow.in/8220

Which of the following fields of an IP header is NOT modified by a typical IP router?

A. Check sum B. Source address C. Time to Live (TTL) D. Length

gate2015-1 computer-networks ip-packet easy

2.18.7 Ip Packet: GATE2015-2-52

https://gateoverflow.in/8255

Host A sends a UDP datagram containing 8880 bytes of user data to host B over an Ethernet LAN. Ethernet frames may carry data up to 1500 bytes (i.e. MTU = 1500 bytes). Size of UDP header is 8 bytes and size of IP header is 20 bytes. There is no option field in IP header. How many total number of IP fragments will be transmitted and what will be the contents of offset field in the last fragment?

A. 6 and 925 B. 6 and 7400 C. 7 and 1110 D. 7 and 8880

gate2015-2 computer-networks ip-packet normal

2.18.8 Ip Packet: GATE2016-1-53

https://gateoverflow.in/39712

An IP datagram of size 1000 bytes arrives at a router. The router has to forward this packet on a link whose MTU (maximum transmission unit) is 100 bytes . Assume that the size of the IP header is 20 bytes .

The number of fragments that the IP datagram will be divided into for transmission is_____.

gate2016-1 computer-networks ip-packet normal numerical-answers

2.19 Ipv4 (7)

2.19.1 Ipv4: GATE2003-27

https://gateoverflow.in/917

Which of the following assertions is FALSE about the Internet Protocol (IP)?

A. It is possible for a computer to have multiple IP addresses
B. IP packets from the same source to the same destination can take different routes in the network
C. IP ensures that a packet is discarded if it is unable to reach its destination within a given number of hops
D. The packet source cannot set the route of an outgoing packets; the route is determined only by the routing tables in the routers on the way

gate2003 computer-networks ipv4 normal

2.19.2 Ipv4: GATE2004-56

https://gateoverflow.in/1052

Consider three IP networks A, B and C. Host H_A in network A sends messages each containing 180 bytes of application data to a host H_C in network C. The TCP layer prefixes 20 byte header to the message.

This passes through an intermediate network B.The maximum packet size, including 20 byte IP header, in each network is:

- A: 1000 bytes
- B: 100 bytes
- C: 1000 bytes

The network A and B are connected through a 1 Mbps link, while B and C

are connected by a 512 Kbps link (bps = bits per second).

Assuming that the packets are correctly delivered, how many bytes, including headers, are delivered to the IP layer at the destination for one application message, in the best case? Consider only data packets.

A. 200 B. 220 C. 240 D. 260

gate2004 computer-networks ipv4 tcp normal

2.19.3 Ipv4: GATE2004-57

https://gateoverflow.in/43572

Consider three IP networks A, B and C. Host H_A in network A sends messages each containing 180 $bytes$ of application data to a host H_C in network C. The TCP layer prefixes 20 byte header to the message. This passes through an intermediate network B. The maximum packet size, including 20 byte IP header, in each network, is:

- A : 1000 bytes
- B : 100 bytes
- C : 1000 bytes

The network A and B are connected through a 1 $Mbps$ link, while B and C are connected by a 512 $Kbps$ link (bps = bits per second).

What is the rate at which application data is transferred to host H_C? Ignore errors, acknowledgments, and other overheads.

A. 325.5 Kbps
B. 354.5 Kbps
C. 409.6 Kbps
D. 512.0 Kbps

gate2004 computer-networks ipv4 tcp normal

2.19.4 Ipv4: GATE2012-23

https://gateoverflow.in/1606

In the IPv4 addressing format, the number of networks allowed under Class C addresses is:

A. 2^{14} B. 2^{7} C. 2^{21} D. 2^{24}

gate2012 computer-networks ipv4 easy

2.19.5 Ipv4: GATE2013-37

https://gateoverflow.in/1548

In an IPv4 datagram, the M bit is 0, the value of $HLEN$ is 10, the value of total length is 400 and the fragment offset value is 300. The position of the datagram, the sequence numbers of the first and the last bytes of the payload, respectively are:

A. Last fragment, 2400 and 2789
B. First fragment, 2400 and 2759
C. Last fragment, 2400 and 2759
D. Middle fragment, 300 and 689

gate2013 computer-networks ipv4 normal

2.19.6 Ipv4: GATE2014-3-27

https://gateoverflow.in/2061

Every host in an IPv4 network has a $1-second$ resolution real-time clock with battery backup. Each host needs to generate up to 1000 unique identifiers per second. Assume that each host has a globally unique IPv4 address. Design a $50-bit$ globally unique ID for this purpose. After what period (in seconds) will the identifiers generated by a host wrap around?

Worst case scenario can be that all 2^{32} host are present on the network each generating 1000 packets simultaneously in 1 sec.
The, in 1 sec total packet produced is 2^{10} * 2^{32}

gate2014-3 computer-networks ipv4 numerical-answers normal

2.19.7 Ipv4: GATE2017-2-20

https://gateoverflow.in/118427

The maximum number of IPv4 router addresses that can be listed in the record route (RR) option field of an IPv4 header is_____.

gate2017-2 computer-networks ipv4 numerical-answers

2.20 Lan Technologies (6)

2.20.1 Lan Technologies: GATE2003-83

https://gateoverflow.in/966

A $2\ km$ long broadcast LAN has 10^7 bps bandwidth and uses CSMA/CD. The signal travels along the wire at 2×10^8 m/s. What is the minimum packet size that can be used on this network?

A. 50 bytes B. 100 bytes C. 200 bytes D. None of the above

gate2003 computer-networks lan-technologies normal

2.20.2 Lan Technologies: GATE2004-IT-27

https://gateoverflow.in/3668

A host is connected to a Department network which is part of a University network. The University network, in turn, is part of the Internet. The largest network in which the Ethernet address of the host is unique is

A. the subnet to which the host belongs
B. the Department network
C. the University network
D. the Internet

gate2004-it computer-networks lan-technologies ethernet normal

2.20.3 Lan Technologies: GATE2005-IT-28

https://gateoverflow.in/3774

Which of the following statements is FALSE regarding a bridge?

Bridge is a layer 2 device

Bridge reduces collision domain

Bridge is used to connect two or more LAN segments

Bridge reduces broadcast domain

gate2005-it computer-networks lan-technologies normal

2.20.4 Lan Technologies: GATE2006-IT-66

https://gateoverflow.in/3610

A router has two full-duplex Ethernet interfaces each operating at $100\ \text{Mb/s}$. Ethernet frames are at least 84 bytes long (including the Preamble and the Inter-Packet-Gap). The maximum packet processing time at the router for wirespeed forwarding to be possible is (in microseconds)

A. 0.01 B. 3.36 C. 6.72 D. 8

gate2006-it computer-networks lan-technologies ethernet normal

2.20.5 Lan Technologies: GATE2007-65

https://gateoverflow.in/1263

There are n stations in 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?

A. $np(1-p)^{n-1}$ B. $(1-p)^{n-1}$ C. $p(1-p)^{n-1}$ D. $1-(1-p)^{n-1}$

gate2007 computer-networks lan-technologies probability normal

2.20.6 Lan Technologies: GATE2019-49

https://gateoverflow.in/302799

Consider that 15 machines need to be connected in a LAN using 8-port Ethernet switches. Assume that these switches do not have any separate uplink ports. The minimum number of switches needed is _____

gate2019 numerical-answers computer-networks lan-technologies

2.21 Link State Routing (1)

2.21.1 Link State Routing: GATE2014-1-23

https://gateoverflow.in/1790

Consider the following three statements about link state and distance vector routing protocols, for a large network with 500 network nodes and 4000 links.

[S1]: The computational overhead in link state protocols is higher than in distance vector protocols.

[S2]: A distance vector protocol (with split horizon) avoids persistent routing loops, but not a link state protocol.

[S3]: After a topology change, a link state protocol will converge faster than a distance vector protocol.

Which one of the following is correct about $S1$, $S2$, and $S3$?

A. $S1$, $S2$, and $S3$ are all true.
B. $S1$, $S2$, and $S3$ are all false.
C. $S1$ and $S2$ are true, but $S3$ is false.
D. $S1$ and $S3$ are true, but $S2$ is false.

gate2014-1 computer-networks routing distance-vector-routing link-state-routing normal

2.22 Mac Protocol (4)

2.22.1 Mac Protocol: GATE2004-IT-85

https://gateoverflow.in/3729

Consider a simplified time slotted MAC protocol, where each host always has data to send and transmits with probability $p = 0.2$ in every slot. There is no backoff and one frame can be transmitted in one slot. If more than one host transmits in the same slot, then the transmissions are unsuccessful due to collision. What is the maximum number of hosts which this protocol can support if each host has to be provided a minimum throughput of 0.16 frames per time slot?

A. 1 B. 2 C. 3 D. 4

gate2004-it computer-networks congestion-control mac-protocol normal

2.22.2 Mac Protocol: GATE2005-74

https://gateoverflow.in/1397

Suppose the round trip propagation delay for a 10 Mbps Ethernet having 48-bit jamming signal is $46.4\ \mu s$. The minimum frame size is:

A. 94 B. 416 C. 464 D. 512

gate2005 computer-networks mac-protocol ethernet

2.22.3 Mac Protocol: GATE2005-IT-75

https://gateoverflow.in/3838

In a TDM medium access control bus LAN, each station is assigned one time slot per cycle for transmission. Assume that the length of each time slot is the time to transmit 100 bitsplus the end-to-end propagation delay. Assume a propagation speed of $2 \times 10^8 m/sec$. The length of the LAN is 1 km with a bandwidth of 10 Mbps. The maximum number of stations that can be allowed in the LAN so that the throughput of each station can be $2/3$ Mbpsis

A. 3 B. 5 C. 10 D. 20

gate2005-it computer-networks mac-protocol normal

2.22.4 Mac Protocol: GATE2015-2-8

https://gateoverflow.in/8056

A link has transmission speed of 10^6 bits/sec. It uses data packets of size 1000 bytes each. Assume that the acknowledgment has negligible transmission delay and that its propagation delay is the same as the data propagation delay. Also, assume that the processing delays at nodes are negligible. The efficiency of the stop-and-wait protocol in this setup is exactly 25%. The value of the one way propagation delay (in milliseconds) is_____.

gate2015-2 computer-networks mac-protocol stop-and-wait normal numerical-answers

2.23 Manchester Encoding (2)

2.23.1 Manchester Encoding: GATE2007-19

https://gateoverflow.in/1217

In Ethernet when Manchester encoding is used, the bit rate is:

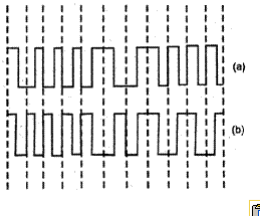
A. Half the baud rate
B. Twice the baud rate
C. Same as the baud rate
D. None of the above

gate2007 computer-networks ethernet manchester-encoding normal

2.23.2 Manchester Encoding: GATE2007-IT-61

https://gateoverflow.in/3505

In the waveform (a) given below, a bit stream is encoded by Manchester encoding scheme. The same bit stream is encoded in a different coding scheme in wave form (b). The bit stream and the coding scheme are



A. 1000010111 and Differential Manchester respectively
B. 0111101000 and Differential Manchester respectively
C. 1000010111 and Integral Manchester respectively
D. 0111101000 and Integral Manchester respectively

gate2007-it computer-networks communication manchester-encoding normal

2.24 Network Addressing (1)

2.24.1 Network Addressing: GATE2005-24

https://gateoverflow.in/1360

The address resolution protocol (ARP) is used for:

A. Finding the IP address from the DNS
B. Finding the IP address of the default gateway
C. Finding the IP address that corresponds to a MAC address
D. Finding the MAC address that corresponds to an IP address

gate2005 computer-networks normal network-addressing

2.25 Network Communication (1)

2.25.1 Network Communication: GATE2017-2-35

https://gateoverflow.in/118537

Consider two hosts X and Y, connected by a single direct link of rate $10^6\,bits/sec$. The distance between the two hosts is $10,000\,km$ and the propagation speed along the link is $2 \times 10^8\,m/sec$. Host X sends a file of $50,000\,bytes$ as one large message to host Y continuously. Let the transmission and propagation delays be p milliseconds and q milliseconds respectively. Then the value of p and q are

A. $p = 50$ and $q = 100$ B. $p = 50$ and $q = 400$ C. $p = 100$ and $q = 50$ D. $p = 400$ and $q = 50$

gate2017-2 computer-networks network-communication

2.26 Network Flow (6)

2.26.1 Network Flow: GATE1992-01,v

https://gateoverflow.in/550

A simple and reliable data transfer can be accomplished by using the 'handshake protocol'. It accomplishes reliable data transfer because for every data item sent by the transmitter _____. The receiver responds that it is ready to receive the data item.

gate1992 computer-networks network-flow easy

2.26.2 Network Flow: GATE1992-02,v

https://gateoverflow.in/560

Choose the correct alternatives (more than one may be correct) and write the corresponding letters only:

(v). Start and stop bits do not contain any 'information' but are used in serial communication

a. Error detection
b. Error correction
c. Synchronization
d. Slowing down the communications

gate1992 easy computer-networks network-flow

2.26.3 Network Flow: GATE2004-IT-80

https://gateoverflow.in/3724

In a data link protocol, the frame delimiter flag is given by 0111. Assuming that bit stuffing is employed, the transmitter sends the data sequence 01110110 as

The bit stuffing is done after every two '11' (as flag is 0111) to differentiate the data part from the flag- there must not be "111" in the data so, after every 11 a '0' is added.

The receiver also knows this and so, it decodes every "110" as "11". Therefore, option D is the answer.

A. 01101011 B. 011010110 C. 011101100 D. 0110101100

gate2004-it computer-networks network-flow normal

2.26.4 Network Flow: GATE2004-IT-87

https://gateoverflow.in/3731

A TCP message consisting of 2100 $bytes$ is passed to IP for delivery across two networks. The first network can carry a maximum payload of 1200 $bytes$ per frame and the second network can carry a maximum payload of 400 $bytes$ per frame, excluding network overhead. Assume that IP overhead per packet is 20 $bytes$. What is the total IP overhead in the second network for this transmission?

A. 40 bytes B. 80 bytes C. 120 bytes D. 160 bytes

gate2004-it computer-networks network-flow normal

2.26.5 Network Flow: GATE2005-IT-72

https://gateoverflow.in/3835

A channel has a bit rate of 4 $kbps$ and one-way propagation delay of 20 ms. The channel uses stop and wait protocol. The transmission time of the acknowledgment frame is negligible. To get a channel efficiency of at least 50%, the minimum frame size should be

A. 80 bytes B. 80 bits C. 160 bytes D. 160 bits

gate2005-it computer-networks network-flow stop-and-wait normal

2.26.6 Network Flow: GATE2006-IT-67

https://gateoverflow.in/3611

A link of capacity 100 Mbps is carrying traffic from a number of sources. Each source generates an on-off traffic stream; when the source is on, the rate of traffic is 10 Mbps, and when the source is off, the rate of traffic is zero. The duty cycle, which is the ratio of on-time to off-time, is 1 : 2. When there is no buffer at the link, the minimum number of sources that can be multiplexed on the link so that link capacity is not wasted and no data loss occurs is $S1$. Assuming that all sources are synchronized and that the link is provided with a large buffer, the maximum number of sources that can be multiplexed so that no data loss occurs is $S2$. The values of $S1$ and $S2$ are, respectively,

A. 10 and 30 B. 12 and 25 C. 5 and 33 D. 15 and 22

gate2006-it computer-networks network-flow normal

2.27 Network Layering (5)

2.27.1 Network Layering: GATE2003-28

https://gateoverflow.in/918

Which of the following functionality $must$ be implemented by a transport protocol over and above the network protocol?

A. Recovery from packet losses
B. Detection of duplicate packets
C. Packet delivery in the correct order
D. End to end connectivity

gate2003 computer-networks network-layering easy

2.27.2 Network Layering: GATE2004-15

https://gateoverflow.in/1012

Choose the best matching between Group 1 and Group 2

Group-1	Group-2
P. Data link layer	1. Ensures reliable transport of data over a physical point-to-point link
Q. Network layer	2. Encodes/decodes data for physical transmission
R. Transport layer	3. Allows end-to-end communication between two processes
	4. Routes data from one network node to the next

A. P-1, Q-4, R-3 B. P-2, Q-4, R-1 C. P-2, Q-3, R-1 D. P-1, Q-3, R-2

gate2004 computer-networks network-layering normal

2.27.3 Network Layering: GATE2013-14

https://gateoverflow.in/1436

Assume that source S and destination D are connected through two intermediate routers labeled R. Determine how many times each packet has to visit the network layer and the data link layer during a transmission from S to D.

A. Network layer – 4 times and Data link layer – 4 times
B. Network layer – 4 times and Data link layer – 3 times
C. Network layer – 4 times and Data link layer – 6 times
D. Network layer – 2 times and Data link layer – 6 times

gate2013 computer-networks network-layering normal

2.27.4 Network Layering: GATE2014-3-23

https://gateoverflow.in/2057

In the following pairs of OSI protocol layer/sub-layer and its functionality, the **INCORRECT** pair is

A. Network layer and Routing
B. Data Link Layer and Bit synchronization
C. Transport layer and End-to-end process communication
D. Medium Access Control sub-layer and Channel sharing

gate2014-3 computer-networks network-layering easy

2.27.5 Network Layering: GATE2018-13

https://gateoverflow.in/204087

Match the following:

Field	Length in bits
P. UDP Header's Port Number	I. 48
Q. Ethernet MAC Address	II. 8
R. IPv6 Next Header	III. 32
S. TCP Header's Sequence Number	IV. 16

A. P-III, Q-IV, R-II, S-I
B. P-II, Q-I, R-IV, S-III
C. P-IV, Q-I, R-II, S-III
D. P-IV, Q-I, R-III, S-II

gate2018 computer-networks network-layering normal

2.28 Network Protocols (7)

2.28.1 Network Protocols: GATE2007-20

https://gateoverflow.in/1218

Which one of the following uses UDP as the transport protocol?

A. HTTP B. Telnet C. DNS D. SMTP

gate2007 computer-networks network-protocols application-layer-protocols easy

2.28.2 Network Protocols: GATE2007-70

https://gateoverflow.in/1268

Match the following:

(P)	SMTP	(1)	Application layer
(Q)	BGP	(2)	Transport layer
(R)	TCP	(3)	Data link layer
(S)	PPP	(4)	Network layer
		(5)	Physical layer

A. P - 2, Q - 1, R - 3, S - 5
B. P - 1, Q - 4, R - 2, S - 3
C. P - 1, Q - 4, R - 2, S - 5
D. P - 2, Q - 4, R - 1, S - 3

gate2007 computer-networks network-layering network-protocols easy

2.28.3 Network Protocols: GATE2007-IT-69

https://gateoverflow.in/3514

Consider the following clauses:

i. Not inherently suitable for client authentication.
ii. Not a state sensitive protocol.
iii. Must be operated with more than one server.
iv. Suitable for structured message organization.
v. May need two ports on the serve side for proper operation.

The option that has the maximum number of correct matches is

A. IMAP-i; FTP-ii; HTTP-iii; DNS-iv; POP3-v
B. FTP-i; POP3-ii; SMTP-iii; HTTP-iv; IMAP-v
C. POP3-i; SMTP-ii; DNS-iii; IMAP-iv; HTTP-v
D. SMTP-i; HTTP-ii; IMAP-iii; DNS-iv; FTP-v

gate2007-it computer-networks network-protocols normal

2.28.4 Network Protocols: GATE2008-IT-68

https://gateoverflow.in/3382

Which of the following statements are TRUE?

- **S1:** TCP handles both congestion and flow control
- **S2:** UDP handles congestion but not flow control
- **S3:** Fast retransmit deals with congestion but not flow control
- **S4:** Slow start mechanism deals with both congestion and flow control

A. $S1$, $S2$ and $S3$ only
B. $S1$ and $S3$ only
C. $S3$ and $S4$ only
D. $S1$, $S3$ and $S4$ only

gate2008-it computer-networks network-protocols normal

2.28.5 Network Protocols: GATE2015-1-17

https://gateoverflow.in/8214

In one of the pairs of protocols given below , both the protocols can use multiple TCP connections between the same client and the server. Which one is that?

A. HTTP, FTP B. HTTP, TELNET C. FTP, SMTP D. HTTP, SMTP

gate2015-1 computer-networks network-protocols normal

2.28.6 Network Protocols: GATE2016-1-24

https://gateoverflow.in/39639

Which one of the following protocols is **NOT** used to resolve one form of address to another one?

A. DNS B. ARP C. DHCP D. RARP

gate2016-1 computer-networks network-protocols normal

2.28.7 Network Protocols: GATE2019-29

https://gateoverflow.in/302819

Suppose that in an IP-over-Ethernet network, a machine X wishes to find the MAC address of another machine Y in its subnet. Which one of the following techniques can be used for this?

A. X sends an ARP request packet to the local gateway's IP address which then finds the MAC address of Y and sends to X
B. X sends an ARP request packet to the local gateway's MAC address which then finds the MAC address of Y and sends to X
C. X sends an ARP request packet with broadcast MAC address in its local subnet
D. X sends an ARP request packet with broadcast IP address in its local subnet

gate2019 computer-networks network-protocols

2.29 Network Security (15)

2.29.1 Network Security: GATE2004-IT-25

https://gateoverflow.in/3666

A sender is employing public key cryptography to send a secret message to a receiver. Which one of the following statements is TRUE?

A. Sender encrypts using receiver's public key
B. Sender encrypts using his own public key

C. Receiver decrypts using sender's public key
D. Receiver decrypts using his own public key

gate2004-it computer-networks network-security normal

2.29.2 Network Security: GATE2004-IT-84

https://gateoverflow.in/3728

Consider a parity check code with three data bits and four parity check bits.
Three of the Code Words are $0101011, 1001101$ and 1110001.
Which of the following are also code words?

I. 0010111
II. 0110110
III. 1011010
IV. 0111010

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

gate2004-it computer-networks network-security normal

2.29.3 Network Security: GATE2005-IT-79

https://gateoverflow.in/3843

Suppose that two parties A and B wish to setup a common secret key (D-H key) between themselves using the Diffie-Hellman key exchange technique. They agree on 7 as the modulus and 3 as the primitive root. Party A chooses 2 and party B chooses 5 as their respective secrets. Their D-H key is

A. 3 B. 4 C. 5 D. 6

gate2005-it computer-networks network-security normal

2.29.4 Network Security: GATE2007-IT-15

https://gateoverflow.in/3448

Consider the following two statements:

i. A hash function (these are often used for computing digital signatures) is an injective function.
ii. A. encryption technique such as DES performs a permutation on the elements of its input alphabet.

Which one of the following options is valid for the above two statements?

A. Both are false
B. Statement (i) is true and the other is false
C. Statement (ii) is true and the other is false
D. Both are true

gate2007-it computer-networks network-security normal

2.29.5 Network Security: GATE2007-IT-18

https://gateoverflow.in/3451

A firewall is to be configured to allow hosts in a private network to freely open TCP connections and send packets on open connections. However, it will only allow external hosts to send packets on existing open TCP connections or connections that are being opened (by internal hosts) but not allow them to open TCP connections to hosts in the private network. To achieve this the minimum capability of the firewall should be that of

A. A combinational circuit
B. A finite automaton
C. A pushdown automaton with one stack
D. A pushdown automaton with two stacks

gate2007-it computer-networks theory-of-computation normal network-security

2.29.6 Network Security: GATE2007-IT-70

https://gateoverflow.in/3515

You are given the following four bytes :

10100011	00110111	11101001	10101011

Which of the following are substrings of the base 64 encoding of the above four bytes?

A. zdp B. fpq C. qwA D. oze

gate2007-it computer-networks network-security normal

2.29.7 Network Security: GATE2008-IT-70 https://gateoverflow.in/3384

The total number of keys required for a set of n individuals to be able to communicate with each other using secret key and public key cryptosystems, respectively are:

A. $n(n-1)$ and $2n$ B. $2n$ and $\frac{n(n-1)}{2}$ C. $\frac{n(n-1)}{2}$ and $2n$ D. $\frac{n(n-1)}{2}$ and n

gate2008-it computer-networks network-security normal

2.29.8 Network Security: GATE2009-46 https://gateoverflow.in/1332

In the RSA public key cryptosystem, the private and public keys are (e, n) and (d, n) respectively, where $n = p \times q$ and p and q are large primes. Besides, n is public and p and q are private. Let M be an integer such that $0 < M < n$ and $\phi(n) = (p-1)(q-1)$. Now consider the following equations.

I. $M' = M^e \bmod n$
$M = (M')^d \bmod n$

II. $ed \equiv 1 \bmod n$

III. $ed \equiv 1 \bmod \phi(n)$

IV. $M' = M^e \bmod \phi(n)$
$M = (M')^d \bmod \phi(n)$

Which of the above equations correctly represents RSA cryptosystem?

A. I and II B. I and III C. II and IV D. III and IV

gate2009 computer-networks network-security normal

2.29.9 Network Security: GATE2013-13 https://gateoverflow.in/1435

Using public key cryptography, X adds a digital signature σ to message M, encrypts $< M, \sigma >$, and sends it to Y, where it is decrypted. Which one of the following sequences of keys is used for the operations?

A. **Encryption:** $X's$ private key followed by $Y's$ private key;
Decryption: $X's$ public key followed by $Y's$ public key;

B. **Encryption:** $X's$ private key followed by $Y's$ public key;
Decryption: $X's$ public key followed by $Y's$ private key;

C. **Encryption:** $X's$ public key followed by $Y's$ private key;
Decryption: $Y's$ public key followed by $X's$ private key;

D. **Encryption:** $X's$ private key followed by $Y's$ public key;
Decryption: $Y's$ private key followed by $X's$ public key

gate2013 computer-networks network-security normal

2.29.10 Network Security: GATE2014-1-24 https://gateoverflow.in/1791

Which of the following are used to generate a message digest by the network security protocols?

I. RSA
II. SHA-1
III. DES
IV. MD5

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

gate2014-1 computer-networks network-security normal

2.29.11 Network Security: GATE2014-2-27 https://gateoverflow.in/1986

An IP machine Q has a path to another $IP\ machine\ H$ via three $IP\ routers\ R1, R2$, and $R3$.
$Q - R1 - R2 - R3 - H$
H acts as an $HTTP\ server$, and Q connects to H via $HTTP$ and downloads a file. Session layer encryption is used, with

DES as the shared key encryption protocol. Consider the following four pieces of information:

$[I1]$ The URL of the file downloaded by Q

$[I2]$ The TCP port numbers at Q and H

$[I3]$ The IP addresses of Q and H

$[I4]$ The link layer addresses of Q and H

Which of $I1$, $I2$, $I3$, and $I4$ can an intruder learn through sniffing at $R2$ alone?

A. Only $I1$ and $I2$ B. Only $I1$ C. Only $I2$ and $I3$ D. Only $I3$ and $I4$

gate2014-2 computer-networks network-security normal

2.29.12 Network Security: GATE2015-1-21

https://gateoverflow.in/8244

Suppose that everyone in a group on N people wants to communicate secretly with the (N - 1) others using symmetric Key cryptographic system.
The communication between any two person should not be decodable by the others in the group. The numbers of keys required in the system as a whole to satisfy the confidentiality requirement is

A. $2N$ B. $N(N-1)$ C. $\frac{N(N-1)}{2}$ D. $(N-1)^2$

gate2015-1 computer-networks network-security normal

2.29.13 Network Security: GATE2016-1-52

https://gateoverflow.in/39694

Consider that B wants to send a message m that is digitally signed to A. Let the pair of private and public keys for A and B be denoted by ${K_x}^-$ and ${K_x}^+$ for $x = A, B$, respectively. Let $K_x(m)$ represent the operation of encrypting m with a key K_x and $H(m)$ represent the message digest. Which one of the following indicates the **CORRECT** way of sending the message m along with the digital signature to A?

A. $\{m, {K_B}^+(H(m))\}$ B. $\{m, {K_B}^-(H(m))\}$
C. $\{m, {K_A}^-(H(m))\}$ D. $\{m, {K_A}^+(m)\}$

gate2016-1 computer-networks network-security easy

2.29.14 Network Security: GATE2019-54

https://gateoverflow.in/302794

In an RSA cryptosystem, the value of the public modulus parameter n is 3007. If it is also known as that $\phi(n) = 2880$ where $\phi()$ denotes Euler's Totient Function, then the prime factor of n which is greater than 50 is _____

gate2019 numerical-answers computer-networks network-security

2.29.15 Network Security: TIFR2011-B-36

https://gateoverflow.in/20918

Consider malware programs. Which of the following is true?

A. A worm is a parasite.
B. A virus cannot affect a linux operating system.
C. A trojan can be in the payload of only a worm.
D. A worm and virus are self replicating programs.
E. There is no difference between a virus and a worm.

tifr2011 computer-networks network-security

2.30 Network Switching (4)

2.30.1 Network Switching: GATE2004-IT-22

https://gateoverflow.in/3663

Which one of the following statements is FALSE?

A. Packet switching leads to better utilization of bandwidth resources than circuit switching
B. Packet switching results in less variation in delay than circuit switching
C. Packet switching requires more per-packet processing than circuit switching
D. Packet switching can lead to reordering unlike in circuit switching

gate2004-it computer-networks network-switching normal

2.30.2 Network Switching: GATE2005-73

https://gateoverflow.in/1396

In a packet switching network, packets are routed from source to destination along a single path having two intermediate nodes. If the message size is 24 bytes and each packet contains a header of 3 bytes, then the optimum packet size is:

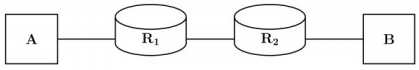
A. 4 B. 6 C. 7 D. 9

gate2005 computer-networks network-switching normal

2.30.3 Network Switching: GATE2014-2-26

https://gateoverflow.in/1985

Consider the store and forward packet switched network given below. Assume that the bandwidth of each link is 10^6 bytes / sec. A user on host A sends a file of size 10^3 bytes to host B through routers $R1$ and $R2$ in three different ways. In the first case a single packet containing the complete file is transmitted from A to B. In the second case, the file is split into 10 equal parts, and these packets are transmitted from A to B. In the third case, the file is split into 20 equal parts and these packets are sent from A to B. Each packet contains 100 bytes of header information along with the user data. Consider only transmission time and ignore processing, queuing and propagation delays. Also assume that there are no errors during transmission. Let $T1$, $T2$ and \$T34 be the times taken to transmit the file in the first, second and third case respectively. Which one of the following is CORRECT?



A. $T < T2 < T3$
B. $T1 > T2 > T3$
C. $T2 = T3, T3 < T1$
D. $T1 = T3, T3 > T2$

gate2014-2 computer-networks network-switching normal

2.30.4 Network Switching: GATE2015-3-36

https://gateoverflow.in/8495

Two hosts are connected via a packet switch with 10^7 bits per second links. Each link has a propagation delay of 20 microseconds. The switch begins forwarding a packet 35 microseconds after it receives the same. If 10000 bits of data are to be transmitted between the two hosts using a packet size of 5000 bits, the time elapsed between the transmission of the first bit of data and the reception of the last bit of the data in microseconds is _____.

gate2015-3 computer-networks normal numerical-answers network-switching

2.31 Routers Bridge Hubs Switches (1)

2.31.1 Routers Bridge Hubs Switches: GATE2004-16

https://gateoverflow.in/1013

Which of the following is NOT true with respect to a transparent bridge and a router?

A. Both bridge and router selectively forward data packets
B. A bridge uses IP addresses while a router uses MAC addresses
C. A bridge builds up its routing table by inspecting incoming packets
D. A router can connect between a LAN and a WAN

gate2004 computer-networks routers-bridge-hubs-switches normal

2.32 Routing (8)

2.32.1 Routing: GATE2005-26

https://gateoverflow.in/1362

In a network of LANs connected by bridges, packets are sent from one LAN to another through intermediate bridges. Since more than one path may exist between two LANs, packets may have to be routed through multiple bridges. Why is the *spanning tree algorithm* used for bridge-routing?

A. For shortest path routing between LANs
B. For avoiding loops in the routing paths
C. For fault tolerance
D. For minimizing collisions

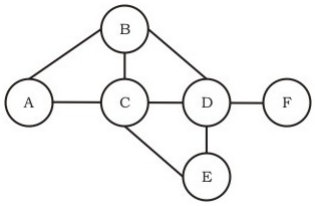
gate2005 computer-networks routing normal

2.32.2 Routing: GATE2005-IT-85a

https://gateoverflow.in/3858

Consider a simple graph with unit edge costs. Each node in the graph represents a router. Each node maintains a routing table indicating the next hop router to be used to relay a packet to its destination and the cost of the path to the destination through that router. Initially, the routing table is empty. The routing table is synchronously updated as follows. In each updated interval, three tasks are performed.

i. A node determines whether its neighbours in the graph are accessible. If so, it sets the tentative cost to each accessible neighbour as 1. Otherwise, the cost is set to ∞.
ii. From each accessible neighbour, it gets the costs to relay to other nodes via that neighbour (as the next hop).
iii. Each node updates its routing table based on the information received in the previous two steps by choosing the minimum cost.



For the graph given above, possible routing tables for various nodes after they have stabilized, are shown in the following options. Identify the correct table.

A.

Table for node A

A	-	-
B	B	1
C	C	1
D	B	3
E	C	3
F	C	4

B.

Table for node C

A	A	1
B	B	1
C	-	-
D	D	1
E	E	1
F	E	3

C.

Table for node B

A	A	1
B	-	-
C	C	1
D	D	1
E	C	2
F	D	2

D.

Table for node D

A	B	3
B	B	1
C	C	1
D	-	-
E	E	1
F	F	1

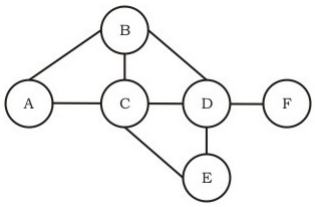
gate2005-it computer-networks routing normal

2.32.3 Routing: GATE2005-IT-85b

https://gateoverflow.in/3859

Consider a simple graph with unit edge costs. Each node in the graph represents a router. Each node maintains a routing table indicating the next hop router to be used to relay a packet to its destination and the cost of the path to the destination through that router. Initially, the routing table is empty. The routing table is synchronously updated as follows. In each updated interval, three tasks are performed.

i. A node determines whether its neighbors in the graph are accessible. If so, it sets the tentative cost to each accessible neighbor as 1. Otherwise, the cost is set to ∞.
ii. From each accessible neighbor, it gets the costs to relay to other nodes via that neighbor (as the next hop).
iii. Each node updates its routing table based on the information received in the previous two steps by choosing the minimum cost.



Continuing from the earlier problem, suppose at some time t, when the costs have stabilized, node A goes down. The cost from node F to node A at time $(t + 100)$ is :

A. > 100 but finite B. ∞ C. 3 D. > 3 and ≤ 100

gate2005-it computer-networks routing normal

2.32.4 Routing: GATE2007-IT-63

https://gateoverflow.in/3508

A group of 15 routers is interconnected in a centralized complete binary tree with a router at each tree node. Router i

communicates with router j by sending a message to the root of the tree. The root then sends the message back down to router j. The mean number of hops per message, assuming all possible router pairs are equally likely is

A. 3 B. 4.26 C. 4.53 D. 5.26

gate2007-it computer-networks routing binary-tree normal

2.32.5 Routing: GATE2008-IT-67

https://gateoverflow.in/3381

Two popular routing algorithms are Distance Vector(DV) and Link State (LS) routing. Which of the following are true?

(S1): Count to infinity is a problem only with DV and not LS routing
(S2): In LS, the shortest path algorithm is run only at one node
(S3): In DV, the shortest path algorithm is run only at one node
(S4): DV requires lesser number of network messages than LS

A. S1, S2 and S4 only B. S1, S3 and S4 only C. S2 and S3 only D. S1 and S4 only

gate2008-it computer-networks routing normal

2.32.6 Routing: GATE2014-2-23

https://gateoverflow.in/1981

Which of the following is TRUE about the interior gateway routing protocols – Routing Information Protocol (RIP) and Open Shortest Path First $(OSPF)$

A. RIP uses distance vector routing and OSPF uses link state routing
B. OSPF uses distance vector routing and RIP uses link state routing
C. Both RIP and OSPF use link state routing
D. Both RIP and OSPF use distance vector routing

gate2014-2 computer-networks routing normal

2.32.7 Routing: GATE2014-3-26

https://gateoverflow.in/2060

An IP router implementing Classless Inter-domain Routing (CIDR) receives a packet with address 131.23.151.76. The router's routing table has the following entries:

Prefix	Outer Interface Identifier
131.16.0.0/12	3
131.28.0.0/14	5
131.19.0.0/16	2
131.22.0.0/15	1

The identifier of the output interface on which this packet will be forwarded is _____.

gate2014-3 computer-networks routing normal numerical-answers

2.32.8 Routing: GATE2017-2-09

https://gateoverflow.in/118338

Consider the following statements about the routing protocols. Routing Information Protocol (RIP) and Oprn Shortest Path First (OSPF) in an IPv4 network.

I. RIP uses distance vector routing
II. RIP packets are sent using UDP
III. OSPF packets are sent using TCP
IV. OSPF operation is based on link-state routing

Which of the above statements are CORRECT?

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

gate2017-2 computer-networks routing

2.33 Rsa Security Networks (1)

2.33.1 Rsa Security Networks: GATE2017-1-44

https://gateoverflow.in/118327

In a RSA cryptosystem, a participant A uses two prime numbers $p = 13$ and $q = 17$ to generate her public and private keys. If the public key of A is 35, then the private key of A is _____ .

gate2017-1 network-security computer-networks rsa-security-networks numerical-answers normal

2.34 Serial Communication (10)

2.34.1 Serial Communication: GATE1987-2-i

https://gateoverflow.in/87074

Match the pairs in the following questions:

(A) Cyclic Redundancy Code	(p) Error Correction
(B) Serial Communication	(q) Wired-OR
(C) Open Collector	(r) Error detection
(D) Hamming Code	(s) RS-232-C

gate1989 descriptive computer-networks serial-communication

2.34.2 Serial Communication: GATE1992-03,v

https://gateoverflow.in/582

Start and stop bits do not contain any "information" but are used in serial communication for

A. Error detection
B. Error correction
C. Synchronization
D. Slowing down the communications.

gate1992 computer-networks easy serial-communication

2.34.3 Serial Communication: GATE1993-6.4, ISRO2008-14

https://gateoverflow.in/2287

Assume that each character code consists of 8 bits. The number of characters that can be transmitted per second through an asynchronous serial line at 2400 baud rate, and with two stop bits is

A. 109 B. 216 C. 218 D. 219

Total bit per character = 8 bit data + 2 stop bit +1 start bit (#) = 11 bits

gate1993 computer-networks serial-communication normal isro2008

2.34.4 Serial Communication: GATE1995-17a

https://gateoverflow.in/2653

An asynchronous serial communication controller that uses a start-stop scheme for controlling the serial I/O of a system is programmed for a string of length seven bits, one parity bit (odd parity) and one stop bit. The transmission rate is 1200 bits/second.

i. What is the complete bit stream that is transmitted for the string '0110101'?
ii. How many such string can be transmitted per second?

gate1995 serial-communication normal descriptive

2.34.5 Serial Communication: GATE1997-2.3

https://gateoverflow.in/2229

Purpose of a start bit in RS-232 serial communication protocol is:

A. to synchronize receiver for receiving every byte
B. to synchronize receiver for receiving a sequence of bytes
C. a parity bit
D. to synchronize receiver for receiving the last byte

gate1997 computer-networks serial-communication normal

2.34.6 Serial Communication: GATE1998-1.16

https://gateoverflow.in/1653

In serial communication employing 8 data bits, a parity bit and 2 stop bits, the minimum band rate required to sustain a transfer rate of 300 characters per second is

A. 2400 band B. 19200 band C. 4800 band D. 1200 band

gate1998 computer-networks communication serial-communication normal

2.34.7 Serial Communication: GATE2002-1.11

https://gateoverflow.in/815

In serial data transmission, every byte of data is padded with a $'0'$ in the beginning and one or two $'1'$s at the end of byte because:

A. receiver is to be synchronized for byte reception
B. receiver recovers lost $'0'$s and $'1'$s from these padded bits
C. padded bits are useful in parity computation
D. none of the above

gate2002 computer-networks serial-communication easy

2.34.8 Serial Communication: GATE2004-22

https://gateoverflow.in/1019

How many $8-bit$ characters can be transmitted per second over a 9600 baud serial communication link using asynchronous mode of transmission with one start bit, eight data bits, two stop bits and one parity bit?

A. 600 B. 800 C. 876 D. 1200

gate2004 computer-networks serial-communication normal

2.34.9 Serial Communication: GATE2004-IT-45

https://gateoverflow.in/3688

A serial transmission $T1$ uses 8 information bits, 2 start bits, 1 stop bit and 1 parity bit for each character. A synchronous transmission $T2$ uses 3 eight-bit sync characters followed by 30 eight-bit information characters. If the bit rate is 1200 bits/second in both cases, what are the transfer rates of $T1$ and $T2$?

A. 100 characters/sec, 153 characters/sec
B. 80 characters/sec, 136 characters/sec
C. 100 characters/sec, 136 characters/sec
D. 80 characters/sec, 153 characters/sec

gate2004-it computer-networks serial-communication normal

2.34.10 Serial Communication: GATE2008-IT-18

https://gateoverflow.in/3278

How many bytes of data can be sent in 15 seconds over a serial link with baud rate of 9600 in asynchronous mode with odd parity and two stop bits in the frame?

A. $10,000$ bytes B. $12,000$ bytes C. $15,000$ bytes D. $27,000$ bytes

gate2008-it computer-networks communication serial-communication normal

2.35 Sliding Window (15)

2.35.1 Sliding Window: GATE2003-84

https://gateoverflow.in/967

Host A is sending data to host B over a full duplex link. A and B are using the sliding window protocol for flow control. The send and receive window sizes are 5 packets each. Data packets (sent only from A to B) are all 1000 bytes long and the transmission time for such a packet is $50\ \mu s$. Acknowledgment packets (sent only from B to A) are very small and require negligible transmission time. The propagation delay over the link is $200\ \mu s$. What is the maximum achievable throughput in this communication?

A. 7.69×10^6 Bps B. 11.11×10^6 Bps
C. 12.33×10^6 Bps D. 15.00×10^6 Bps

gate2003 computer-networks sliding-window normal

2.35.2 Sliding Window: GATE2004-IT-81

https://gateoverflow.in/3725

In a sliding window ARQ scheme, the transmitter's window size is N and the receiver's window size is M. The minimum number of distinct sequence numbers required to ensure correct operation of the ARQ scheme is

A. $min(M, N)$ B. $max(M, N)$ C. $M + N$ D. MN

gate2004-it computer-networks sliding-window normal

2.35.3 Sliding Window: GATE2004-IT-83

https://gateoverflow.in/3727

A 20 Kbps satellite link has a propagation delay of 400 ms. The transmitter employs the "go back n ARQ" scheme with n set to 10. Assuming that each frame is 100 byte long, what is the maximum data rate possible?

A. 5 Kbps
B. 10 Kbps
C. 15 Kbps
D. 20 Kbps

gate2004-it computer-networks sliding-window normal

2.35.4 Sliding Window: GATE2004-IT-88

https://gateoverflow.in/3732

Suppose that the maximum transmit window size for a TCP connection is 12000 bytes. Each packet consists of 2000 bytes. At some point in time, the connection is in slow-start phase with a current transmit window of 4000 bytes. Subsequently, the transmitter receives two acknowledgments. Assume that no packets are lost and there are no time-outs. What is the maximum possible value of the current transmit window?

A. 4000 bytes B. 8000 bytes C. 10000 bytes D. 12000 bytes

gate2004-it computer-networks sliding-window normal

2.35.5 Sliding Window: GATE2005-25

https://gateoverflow.in/1361

The maximum window size for data transmission using the selective reject protocol with n-bit frame sequence numbers is:

A. 2^n B. 2^{n-1} C. $2^n - 1$ D. 2^{n-2}

gate2005 computer-networks sliding-window easy

2.35.6 Sliding Window: GATE2006-44

https://gateoverflow.in/1820

Station A uses 32 byte packets to transmit messages to Station B using a sliding window protocol. The round trip delay between A and B is 80 milliseconds and the bottleneck bandwidth on the path between A and B is 128 kbps . What is the optimal window size that A should use?

A. 20 B. 40 C. 160 D. 320

gate2006 computer-networks sliding-window normal

2.35.7 Sliding Window: GATE2006-46

https://gateoverflow.in/1822

Station A needs to send a message consisting of 9 packets to Station B using a sliding window (window size 3) and go-back-n error control strategy. All packets are ready and immediately available for transmission. If every 5^{th} packet that A transmits gets lost (but no acks from B ever get lost), then what is the number of packets that A will transmit for sending the message to B?

A. 12 B. 14 C. 16 D. 18

gate2006 computer-networks sliding-window normal

2.35.8 Sliding Window: GATE2006-IT-64

https://gateoverflow.in/3608

Suppose that it takes 1 unit of time to transmit a packet (of fixed size) on a communication link. The link layer uses a window flow control protocol with a window size of N packets. Each packet causes an ack or a nak to be generated by the receiver, and ack/nak transmission times are negligible. Further, the round trip time on the link is equal to N units. Consider time $i > N$. If only acks have been received till time i(no naks), then the goodput evaluated at the transmitter at time i(in packets per unit time) is

A. $1 - \frac{N}{i}$ B. $\frac{i}{(N+i)}$ C. 1 D. $1 - e^{(\frac{i}{N})}$

Goodput =Successfully delivered data / Time

So, successfully delivered packets =(i−N)

Time for transmission =i

gate2006-it computer-networks sliding-window normal

2.35.9 Sliding Window: GATE2007-69

https://gateoverflow.in/1267

The distance between two stations M and N is L kilometers. All frames are K bits long. The propagation delay per kilometer is t seconds. Let R bits/second be the channel capacity. Assuming that the processing delay is negligible, the minimum number of bits for the sequence number field in a frame for maximum utilization, when the sliding window protocol is used, is:

A. $\lceil \log_2 \frac{2LtR+2K}{K} \rceil$
B. $\lceil \log_2 \frac{2LtR}{K} \rceil$
C. $\lceil \log_2 \frac{2LtR+K}{K} \rceil$
D. $\lceil \log_2 \frac{2LtR+2K}{2K} \rceil$

gate2007 computer-networks sliding-window normal

2.35.10 Sliding Window: GATE2008-IT-64

https://gateoverflow.in/3375

A 1 Mbps satellite link connects two ground stations. The altitude of the satellite is $36,504$ km and speed of the signal is 3×10^8 m/s. What should be the packet size for a channel utilization of 25% for a satellite link using go-back-127 sliding window protocol? Assume that the acknowledgment packets are negligible in size and that there are no errors during communication.

A. 120 bytes
B. 60 bytes
C. 240 bytes
D. 90 bytes

gate2008-it computer-networks sliding-window normal

2.35.11 Sliding Window: GATE2009-57, ISRO2016-75

https://gateoverflow.in/1340

Frames of 1000 bits are sent over a 10^6 bps duplex link between two hosts. The propagation time is 25 ms. Frames are to be transmitted into this link to maximally pack them in transit (within the link).

What is the minimum number of bits (I) that will be required to represent the sequence numbers distinctly? Assume that no time gap needs to be given between transmission of two frames.

A. $I = 2$
B. $I = 3$
C. $I = 4$
D. $I = 5$

gate2009 computer-networks sliding-window normal isro2016

2.35.12 Sliding Window: GATE2009-58

https://gateoverflow.in/43470

Frames of 1000 bits are sent over a 10^6 bps duplex link between two hosts. The propagation time is $25ms$. Frames are to be transmitted into this link to maximally pack them in transit (within the link).

Let I be the minimum number of bits (I) that will be required to represent the sequence numbers distinctly assuming that no time gap needs to be given between transmission of two frames.

Suppose that the sliding window protocol is used with the sender window size of 2^I, where I is the numbers of bits as mentioned earlier and acknowledgements are always piggy backed. After sending 2^I frames, what is the minimum time the sender will have to wait before starting transmission of the next frame? (Identify the closest choice ignoring the frame processing time)

A. $16ms$
B. $18ms$
C. $20ms$
D. $22ms$

gate2009 computer-networks sliding-window normal

2.35.13 Sliding Window: GATE2014-1-28

https://gateoverflow.in/1795

Consider a selective repeat sliding window protocol that uses a frame size of 1 KB to send data on a 1.5 Mbps link with a one-way latency of 50 msec. To achieve a link utilization of 60%, the minimum number of bits required to represent the sequence number field is _____.

gate2014-1 computer-networks sliding-window numerical-answers normal

2.35.14 Sliding Window: GATE2015-3-28

https://gateoverflow.in/8481

Consider a network connecting two systems located 8000 Km apart. The bandwidth of the network is 500×10^6 bits per second. The propagation speed of the media is 4×10^6 meters per second. It needs to design a Go-Back-N sliding window protocol for this network. The average packet size is 10^7 bits. The network is to be used to its full capacity. Assume that processing delays at nodes are negligible. Then, the minimum size in bits of the sequence number field has to be _____.

gate2015-3 computer-networks sliding-window normal numerical-answers

2.35.15 Sliding Window: GATE2016-2-55

https://gateoverflow.in/39577

Consider a 128×10^3 bits/second satellite communication link with one way propagation delay of 150 milliseconds. Selective retransmission (repeat) protocol is used on this link to send data with a frame size of 1 kilobyte. Neglect the transmission time of acknowledgement. The minimum number of bits required for the sequence number field to achieve 100% utilization is _____.

gate2016-2 computer-networks sliding-window normal numerical-answers

2.36 Sockets (4)

2.36.1 Sockets: GATE2008-17

https://gateoverflow.in/415

Which of the following system calls results in the sending of SYN packets?

A. socket B. bind C. listen D. connect

gate2008 normal computer-networks sockets

2.36.2 Sockets: GATE2008-59

https://gateoverflow.in/482

A client process P needs to make a TCP connection to a server process S. Consider the following situation: the server process S executes a $\texttt{socket}()$, a $\texttt{bind}()$ and a $\texttt{listen}()$ system call in that order, following which it is preempted. Subsequently, the client process P executes a $\texttt{socket}()$ system call followed by $\texttt{connect}()$ system call to connect to the server process S. The server process has not executed any $\texttt{accept}()$ system call. Which one of the following events could take place?

A. $\texttt{connect}()$ system call returns successfully
B. $\texttt{connect}()$ system call blocks
C. $\texttt{connect}()$ system call returns an error
D. $\texttt{connect}()$ system call results in a core dump

gate2008 computer-networks sockets normal

2.36.3 Sockets: GATE2014-2-24

https://gateoverflow.in/1982

Which of the following socket API functions converts an unconnected active TCP socket into a passive socket?

A. connect B. bind C. listen D. accept

gate2014-2 computer-networks sockets easy

2.36.4 Sockets: GATE2015-2-20

https://gateoverflow.in/8108

Identify the correct order in which a server process must invoke the function calls accept, bind, listen, and recv according to UNIX socket API.

A. listen, accept, bind, recv
B. bind, listen, accept, recv
C. bind, accept, listen, recv
D. accept, listen, bind, recv

gate2015-2 computer-networks sockets easy

2.37 Stop And Wait (4)

2.37.1 Stop And Wait: GATE2006-IT-68

https://gateoverflow.in/3612

On a wireless link, the probability of packet error is 0.2. A stop-and-wait protocol is used to transfer data across the link. The channel condition is assumed to be independent of transmission to transmission. What is the average number of transmission attempts required to transfer 100 packets?

A. 100 B. 125 C. 150 D. 200

gate2006-it computer-networks sliding-window stop-and-wait normal

2.37.2 Stop And Wait: GATE2015-1-53

https://gateoverflow.in/8363

Suppose that the stop-and-wait protocol is used on a link with a bit rate of 64 kilobits per second and 20 milliseconds propagation delay. Assume that the transmission time for the acknowledgment and the processing time at nodes are negligible. Then the minimum frame size in bytes to achieve a link utilization of at least 50 % is_____.

gate2015-1 computer-networks stop-and-wait normal numerical-answers

2.37.3 Stop And Wait: GATE2016-1-55

https://gateoverflow.in/39696

A sender uses the Stop-and-Wait ARQ protocol for reliable transmission of frames. Frames are of size 1000 bytes and the transmission rate at the sender is 80 Kbps (1 Kbps = 1000 bits/second). Size of an acknowledgment is 100 bytes and the transmission rate at the receiver is 8 Kbps. The one-way propagation delay is 100 milliseconds.

Assuming no frame is lost, the sender throughput is _____ bytes/ second.

gate2016-1 computer-networks stop-and-wait normal numerical-answers

2.37.4 Stop And Wait: GATE2017-1-45

https://gateoverflow.in/118328

The values of parameters for the Stop-and-Wait ARQ protocol are as given below:

- Bit rate of the transmission channel = 1 Mbps.
- Propagation delay from sender to receiver = 0.75 ms.
- Time to process a frame = 0.25 ms.
- Number of bytes in the information frame = 1980.
- Number of bytes in the acknowledge frame = 20.
- Number of overhead bytes in the information frame = 20.

Assume there are no transmission errors. Then, the transmission efficiency (expressed in percentage) of the Stop-and-Wait ARQ protocol for the above parameters is _____ (correct to 2 decimal places).

gate2017-1 computer-networks stop-and-wait numerical-answers normal

2.38 Subnetting (17)

2.38.1 Subnetting: GATE2003-82, ISRO2009-1

https://gateoverflow.in/965

The subnet mask for a particular network is 255.255.31.0. Which of the following pairs of IP addresses could belong to this network?

A. 172.57.88.62 and 172.56.87.23
B. 10.35.28.2 and 10.35.29.4
C. 191.203.31.87 and 191.234.31.88
D. 128.8.129.43 and 128.8.161.55

gate2003 computer-networks subnetting normal isro2009

2.38.2 Subnetting: GATE2004-55

https://gateoverflow.in/1051

The routing table of a router is shown below:

Destination	Subnet Mask	Interface
128.75.43.0	255.255.255.0	Eth0
128.75.43.0	255.255.255.128	Eth1
192.12.17.5	255.255.255.255	Eth3
Default		Eth2

On which interface will the router forward packets addressed to destinations 128.75.43.16 and 192.12.17.10 respectively?

A. Eth1 and Eth2 B. Eth0 and Eth2 C. Eth0 and Eth3 D. Eth1 and Eth3

gate2004 computer-networks subnetting normal

2.38.3 Subnetting: GATE2004-IT-26

https://gateoverflow.in/3667

A subnet has been assigned a subnet mask of 255.255.255.192. What is the maximum number of hosts that can belong to this subnet?

A. 14 B. 30 C. 62 D. 126

gate2004-it computer-networks subnetting normal

2.38.4 Subnetting: GATE2005-27

https://gateoverflow.in/1363

An organization has a class B network and wishes to form subnets for 64 departments. The subnet mask would be:

A. $255.255.0.0$ B. $255.255.64.0$ C. $255.255.128.0$ D. $255.255.252.0$

gate2005 computer-networks subnetting normal

2.38.5 Subnetting: GATE2005-IT-76

https://gateoverflow.in/3839

A company has a class C network address of $204.204.204.0$. It wishes to have three subnets, one with 100 hosts and two with 50 hosts each. Which one of the following options represents a feasible set of subnet address/subnet mask pairs?

A. $204.204.204.128/255.255.255.192$
$204.204.204.0/255.255.255.128$
$204.204.204.64/255.255.255.128$
B. $204.204.204.0/255.255.255.192$
$204.204.204.192/255.255.255.128$
$204.204.204.64/255.255.255.128$
C. $204.204.204.128/255.255.255.128$
$204.204.204.192/255.255.255.192$
$204.204.204.224/255.255.255.192$
D. $204.204.204.128/255.255.255.128$
$204.204.204.64/255.255.255.192$
$204.204.204.0/255.255.255.192$

gate2005-it computer-networks subnetting normal

2.38.6 Subnetting: GATE2006-45

https://gateoverflow.in/1821

Two computers $C1$ and $C2$ are configured as follows. $C1$ has IP address $203.197.2.53$ and netmask $255.255.128.0$. $C2$ has IP address $203.197.75.201$ and netmask $255.255.192.0$. Which one of the following statements is true?

A. $C1$ and $C2$ both assume they are on the same network
B. $C2$ assumes $C1$ is on same network, but $C1$ assumes $C2$ is on a different network
C. $C1$ assumes $C2$ is on same network, but $C2$ assumes $C1$ is on a different network
D. $C1$ and $C2$ both assume they are on different networks.

gate2006 computer-networks subnetting normal

2.38.7 Subnetting: GATE2006-IT-63, ISRO2015-57

https://gateoverflow.in/3607

A router uses the following routing table:

Destination	Mask	Interface
144.16.0.0	255.255.0.0	eth0
144.16.64.0	255.255.224.0	eth1
144.16.68.0	255.255.255.0	eth2
144.16.68.64	255.255.255.224	eth3

Packet bearing a destination address $144.16.68.117$ arrives at the router. On which interface will it be forwarded?

A. eth0 B. eth1 C. eth2 D. eth3

gate2006-it computer-networks subnetting normal isro2015

2.38.8 Subnetting: GATE2006-IT-70

https://gateoverflow.in/3614

A subnetted Class B network has the following broadcast address: $144.16.95.255$

Its subnet mask

A. is necessarily $255.255.224.0$ B. is necessarily $255.255.240.0$

C. is necessarily $255.255.248.0$

D. could be any one of $255.255.224.0$, $255.255.240.0$, $255.255.248.0$

gate2006-it computer-networks subnetting normal

2.38.9 Subnetting: GATE2007-67, ISRO2016-72

https://gateoverflow.in/1265

The address of a class B host is to be split into subnets with a 6-bit subnet number. What is the maximum number of subnets and the maximum number of hosts in each subnet?

A. 62 subnets and 262142 hosts.

B. 64 subnets and 262142 hosts.

C. 62 subnets and 1022 hosts.

D. 64 subnets and 1024 hosts.

gate2007 computer-networks subnetting easy isro2016

2.38.10 Subnetting: GATE2008-57

https://gateoverflow.in/480

If a class B network on the Internet has a subnet mask of $255.255.248.0$, what is the maximum number of hosts per subnet?

A. 1022 B. 1023 C. 2046 D. 2047

gate2008 computer-networks subnetting easy

2.38.11 Subnetting: GATE2008-IT-84

https://gateoverflow.in/3408

Host X has IP address $192.168.1.97$ and is connected through two routers $R1$ and $R2$ to another host Y with IP address $192.168.1.80$. Router $R1$ has IP addresses $192.168.1.135$ and $192.168.1.110$. $R2$ has IP addresses $192.168.1.67$ and $192.168.1.155$. The netmask used in the network is $255.255.255.224$.

Given the information above, how many distinct subnets are guaranteed to already exist in the network?

A. 1 B. 2 C. 3 D. 6

gate2008-it computer-networks subnetting normal

2.38.12 Subnetting: GATE2008-IT-85

https://gateoverflow.in/3409

Host X has IP address $192.168.1.97$ and is connected through two routers $R1$ and $R2$ to another host Y with IP address $192.168.1.80$. Router $R1$ has IP addresses $192.168.1.135$ and $192.168.1.110$. $R2$ has IP addresses $192.168.1.67$ and $192.168.1.155$. The netmask used in the network is $255.255.255.224$.

Which IP address should X configure its gateway as?

A. $192.168.1.67$

B. $192.168.1.110$

C. $192.168.1.135$

D. $192.168.1.155$

gate2008-it computer-networks subnetting normal

2.38.13 Subnetting: GATE2010-47

https://gateoverflow.in/2349

Suppose computers A and B have IP addresses $10.105.1.113$ and $10.105.1.91$ respectively and they both use same netmask N. Which of the values of N given below should not be used if A and B should belong to the same network?

A. $255.255.255.0$

B. $255.255.255.128$

C. $255.255.255.192$

D. $255.255.255.224$

gate2010 computer-networks subnetting easy

2.38.14 Subnetting: GATE2012-34, ISRO-DEC2017-32

https://gateoverflow.in/1752

An Internet Service Provider (ISP) has the following chunk of CIDR-based IP addresses available with it: $245.248.128.0/20$. The ISP wants to give half of this chunk of addresses to Organization A, and a quarter to Organization B, while retaining the remaining with itself. Which of the following is a valid allocation of addresses to A and B?

A. $245.248.136.0/21$ and $245.248.128.0/22$

B. $245.248.128.0/21$ and $245.248.128.0/22$

C. $245.248.132.0/22$ and $245.248.132.0/21$

D. $245.248.136.0/24$ and $245.248.132.0/21$

gate2012 computer-networks subnetting normal isrodec2017

2.38.15 Subnetting: GATE2015-2-41

https://gateoverflow.in/8213

Consider the following routing table at an IP router:

Network No	Net Mask	Next Hop
128.96.170.0	255.255.254.0	Interface 0
128.96.168.0	255.255.254.0	Interface 1
128.96.166.0	255.255.254.0	R2
128.96.164.0	255.255.252.0	R3
0.0.0.0	Default	R4

For each IP address in Group I Identify the correct choice of the next hop from Group II using the entries from the routing table above.

Group I	Group II
i) 128.96.171.92	a) Interface 0
ii) 128.96.167.151	b) Interface 1
iii) 128.96.163.151	c) R2
iv) 128.96.164.121	d) R3
	e) R4

A. i-a, ii-c, iii-e, iv-d
B. i-a, ii-d, iii-b, iv-e
C. i-b, ii-c, iii-d, iv-e
D. i-b, ii-c, iii-e, iv-d

gate2015-2 computer-networks subnetting easy

2.38.16 Subnetting: GATE2015-3-38

https://gateoverflow.in/8497

In the network $200.10.11.144/27$, the $fourth$ octet (in decimal) of the last IP address of the network which can be assigned to a host is _____.

gate2015-3 computer-networks subnetting normal numerical-answers

2.38.17 Subnetting: GATE2019-28

https://gateoverflow.in/302820

Consider three machines M, N, and P with IP addresses $100.10.5.2$, $100.10.5.5$, and $100.10.5.6$ respectively. The subnet mask is set to $255.255.255.252$ for all the three machines. Which one of the following is true?

A. M, N, and P all belong to the same subnet
B. Only M and N belong to the same subnet
C. Only N and P belong to the same subnet
D. M, N, and P belong to three different subnets

gate2019 computer-networks subnetting

2.39 Tcp (13)

2.39.1 Tcp: GATE2004-IT-23

https://gateoverflow.in/3664

Which one of the following statements is FALSE?

A. TCP guarantees a minimum communication rate
B. TCP ensures in-order delivery
C. TCP reacts to congestion by reducing sender window size
D. TCP employs retransmission to compensate for packet loss

gate2004-it computer-networks tcp normal

2.39.2 Tcp: GATE2004-IT-28

https://gateoverflow.in/3669

In TCP, a unique sequence number is assigned to each

A. byte B. word C. segment D. message

gate2004-it computer-networks tcp normal

2.39.3 Tcp: GATE2007-IT-13

https://gateoverflow.in/3446

Consider the following statements about the timeout value used in TCP.

i. The timeout value is set to the RTT (Round Trip Time) measured during TCP connection establishment for the entire duration of the connection.
ii. Appropriate RTT estimation algorithm is used to set the timeout value of a TCP connection.
iii. Timeout value is set to twice the propagation delay from the sender to the receiver.

Which of the following choices hold?

A. (i) is false, but (ii) and (iii) are true
B. (i) and (iii) are false, but (ii) is true
C. (i) and (ii) are false, but (iii) is true
D. (i), (ii) and (iii) are false

gate2007-it computer-networks tcp normal

2.39.4 Tcp: GATE2007-IT-14

https://gateoverflow.in/3447

Consider a TCP connection in a state where there are no outstanding ACKs. The sender sends two segments back to back. The sequence numbers of the first and second segments are 230 and 290 respectively. The first segment was lost, but the second segment was received correctly by the receiver. Let X be the amount of data carried in the first segment (in bytes), and Y be the ACK number sent by the receiver.
The values of X and Y (in that order) are

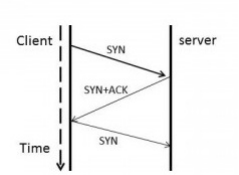
A. 60 and 290
B. 230 and 291
C. 60 and 231
D. 60 and 230

gate2007-it computer-networks tcp normal

2.39.5 Tcp: GATE2008-IT-69

https://gateoverflow.in/3383

The three way handshake for TCP connection establishment is shown below.



Which of the following statements are TRUE?
$S1$: Loss of $SYN + ACK$ from the server will not establish a connection

$S2$: Loss of ACK from the client cannot establish the connection

$S3$: The server moves $LISTEN \rightarrow SYN\_RCVD \rightarrow SYN\_SENT \rightarrow ESTABLISHED$ in the state machine on no packet loss

$S4$: The server moves $LISTEN \rightarrow SYN\_RCVD \rightarrow ESTABLISHED$ in the state machine on no packet loss

A. $S2$ and $S3$ only
B. $S1$ and $S4$ only
C. $S1$ and $S3$ only
D. $S2$ and $S4$ only

gate2008-it computer-networks tcp normal

2.39.6 Tcp: GATE2009-47

https://gateoverflow.in/1333

While opening a TCP connection, the initial sequence number is to be derived using a time-of-day (ToD) clock that keeps running even when the host is down. The low order 32 bits of the counter of the ToD clock is to be used for the initial sequence numbers. The clock counter increments once per milliseconds. The maximum packet lifetime is given to be 64s.

Which one of the choices given below is closest to the minimum permissible rate at which sequence numbers used for packets of a connection can increase?

A. 0.015/s
B. 0.064/s
C. 0.135/s
D. 0.327/s

gate2009 computer-networks tcp difficult ambiguous

2.39.7 Tcp: GATE2012-22

https://gateoverflow.in/1605

Which of the following transport layer protocols is used to support electronic mail?

A. SMTP B. IP C. TCP D. UDP

gate2012 computer-networks tcp easy

2.39.8 Tcp: GATE2015-1-19

https://gateoverflow.in/8217

Suppose two hosts use a TCP connection to transfer a large file . Which of the following statements is/are FALSE with respect to the TCP connection?

I. If the sequence number of a segment is m, then the sequence number of the subsequent segment is always m+1.
II. If the estimated round trip time at any given point of time is t sec, the value of the retransmission timeout is always set to greater than or equal to t sec.
III. The size of the advertised window never changes during the course of the TCP connection.
IV. The number of unacknowledged bytes at the sender is always less than or equal to the advertised window.

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

gate2015-1 computer-networks tcp normal

2.39.9 Tcp: GATE2015-2-34

https://gateoverflow.in/8154

Assume that the bandwidth for a TCP connection is 1048560 bits/sec. Let α be the value of RTT in milliseconds (rounded off to the nearest integer) after which the TCP window scale option is needed. Let β be the maximum possible window size with window scale option. Then the values of α and β are

A. 63 milliseconds, 65535×2^{14}
B. 63 milliseconds, 65535×2^{16}
C. 500 milliseconds, 65535×2^{14}
D. 500 milliseconds, 65535×2^{16}

gate2015-2 computer-networks difficult tcp

2.39.10 Tcp: GATE2015-3-22

https://gateoverflow.in/8425

Consider the following statements.

I. TCP connections are full duplex
II. TCP has no option for selective acknowledgement
III. TCP connections are message streams

A. Only I is correct
B. Only I and III are correct
C. Only II and III are correct
D. All of I, II and III are correct

gate2015-3 computer-networks tcp normal

2.39.11 Tcp: GATE2016-2-25

https://gateoverflow.in/39572

Identify the correct sequence in which the following packets are transmitted on the network by a host when a browser requests a webpage from a remote server, assuming that the host has just been restarted.

A. HTTP GET request, DNS query, TCP SYN
B. DNS query, HTTP GET request, TCP SYN
C. DNS query, TCP SYN, HTTP GET request.
D. TCP SYN, DNS query, HTTP GET request.

gate2016-2 computer-networks normal tcp

2.39.12 Tcp: GATE2017-1-14

https://gateoverflow.in/118194

Consider a TCP client and a TCP server running on two different machines. After completing data transfer, the TCP client calls close to terminate the connection and a FIN segment is sent to the TCP server. Server-side TCP responds by sending an ACK, which is received by the client-side TCP. As per the TCP connection state diagram (RFC 793), in which state does the client-side TCP connection wait for the FIN from the server-side TCP?

A. LAST-ACK B. TIME-WAIT C. FIN-WAIT-1 D. FIN-WAIT-2

gate2017-1 computer-networks tcp

2.39.13 Tcp: GATE2018-25

https://gateoverflow.in/204099

Consider a long-lived TCP session with an end-to-end bandwidth of 1 Gbps (-10^9 bits-per-second). The session starts with a sequence number of 1234. The minimum time (in seconds, rounded to the closet integer) before this sequence number can be used again is ____ Total sequence number= 2^{32} * 8

gate2018 computer-networks tcp normal numerical-answers

2.40 Token Bucket (2)

2.40.1 Token Bucket: GATE2008-58

https://gateoverflow.in/481

A computer on a 10 $Mbps$ network is regulated by a token bucket. The token bucket is filled at a rate of 2 $Mbps$. It is initially filled to capacity with 16 $Megabits$. What is the maximum duration for which the computer can transmit at the full 10 $Mbps$?

A. 1.6 seconds B. 2 seconds C. 5 seconds D. 8 seconds

gate2008 computer-networks token-bucket

2.40.2 Token Bucket: GATE2016-1-54

https://gateoverflow.in/39720

For a host machine that uses the token bucket algorithm for congestion control, the token bucket has a capacity of 1 megabyte and the maximum output rate is 20 megabytes per second. Tokens arrive at a rate to sustain output at a rate of 10 megabytes per second. The token bucket is currently full and the machine needs to send 12 megabytes of data. The minimum time required to transmit the data is _____ seconds.

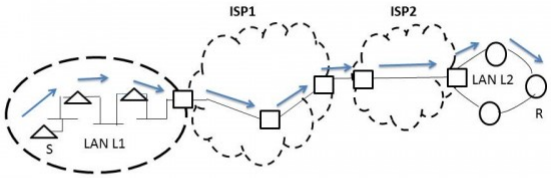
gate2016-1 computer-networks token-bucket normal numerical-answers

2.41 Token Ring (1)

2.41.1 Token Ring: GATE2014-2-25

https://gateoverflow.in/1983

In the diagram shown below, $L1$ is an Ethernet LAN and $L2$ is a Token-Ring LAN. An IP packet originates from sender S and traverses to R, as shown. The links within each ISP and across the two ISPs, are all point-to-point optical links. The initial value of the TTL field is 32. The maximum possible value of the TTL field when R receives the datagram is _____.



gate2014-2 computer-networks numerical-answers lan-technologies ethernet token-ring normal

2.42 Udp (4)

2.42.1 Udp: GATE2005-23

https://gateoverflow.in/1359

Packets of the same session may be routed through different paths in:

A. TCP, but not UDP
B. TCP and UDP
C. UDP, but not TCP
D. Neither TCP nor UDP

gate2005 computer-networks tcp udp easy

2.42.2 Udp: GATE2006-IT-69

https://gateoverflow.in/3613

A program on machine X attempts to open a UDP connection to port 5376 on a machine Y, and a TCP connection to port 8632 on machine Z. However, there are no applications listening at the corresponding ports on Y and Z. An $ICMP$ Port Unreachable error will be generated by

A. Y but not Z B. Z but not Y C. Neither Y nor Z D. Both Y and Z

gate2006-it computer-networks tcp udp normal

2.42.3 Udp: GATE2013-12

https://gateoverflow.in/1421

The transport layer protocols used for real time multimedia, file transfer, DNS and email, respectively are

A. TCP, UDP, UDP and TCP
B. UDP, TCP, TCP and UDP
C. UDP, TCP, UDP and TCP
D. TCP, UDP, TCP and UDP

gate2013 computer-networks tcp udp easy

2.42.4 Udp: GATE2017-2-18

https://gateoverflow.in/118209

Consider socket API on a Linux machine that supports connected UDP sockets. A connected UDP socket is a UDP socket on which *connect* function has already been called. Which of the following statements is/are CORRECT?

I. A connected UDP socket can be used to communicate with multiple peers simultaneously.
II. A process can successfully call *connect* function again for an already connected UDP socket.

A. I only B. II only C. Both I and II D. Neither I nor II

gate2017-2 computer-networks udp

2.43 Wifi (1)

2.43.1 Wifi: GATE2016-2-54

https://gateoverflow.in/39593

For the $IEEE$ 802.11 MAC protocol for wireless communication, which of the following statements is/are **TRUE**?

I. At least three non-overlapping channels are available for transmissions.
II. The RTS-CTS mechanism is used for collision detection.
III. Unicast frames are ACKed.

A. All I, II, and III B. I and III only C. II and III only D. II only

gate2016-2 computer-networks wifi normal