Q.1) Max Marks: 1

In which case does every router keep a detailed description of the entire network?

A **with link-state and not with distance vector.** Correct Option

Solution: (A)
Ans A
Explanation:
In link-state routing, the LSP packets are used as flooding to gather all the information about the network. LSP packet contains all the information about the network. In distance vector routing the adjacent nodes share their tables.

B **both with distance vector and link state.**

C **neither with distance vector nor with link state.**

D **with distance vector and not with link state.**

Q.2) Max Marks: 1

St 1: The maximum value of TTL can attain in the IPV4 header is 254.
St 2: The TTL field is set by the sender of the datagram, and reduced by every router on the route to its destination.
St 3: The error message sends by the ICMP when TTL becomes zero before datagram reaches the destination is the Parameter problem message.
Which of the following statements is/are true?

A **All are correct.**

B **St 2 and St 3 are correct**

C **St 1 and St 2 are correct**

D **Only St 2 is correct** Correct Option

Solution: (D)
Ans d
Explanation: St 1: TTL is an 8-bit field the maximum value TTL can attain is 255.
St 2: This is true TTL value is reduced while passing from every router in the route.
St 3: The error message is sent by ICMP time exceeded message.

Q.3) Max Marks: 1

Which of the following is a correct representation of the IPv6 in decimal number format?

A **105.220.136.100.255.255.255.255.0.0.18.128.140.10.255.255** Correct Option

Solution: (A)
Ans a
Explanation: The IPV6 address is 128 bit. Each octet maximum decimal value is 255 and the total 16 octets are possible.

B **105.220.136.100.255.255.255.256.0.0.18.128.140.10.255.255**

C **105.220.136.100.255.255.255.255.0.0.18.128.140.10.255.255.256**

D **105.220.136.100.255.255.255.255.0.0.18.128.140.10.255**

Q.4) Max Marks: 1

What is the purpose of having a flow label is IPV6?

A **If the flow label is set to zero, this means the packet is not labeled or not part of any flow.**

B **The source can request special handling by the IP routers using the flow label.**

C **The source labels the sequence to help the router identify that a particular packet belongs to a specific flow of information.**

D **All of the above.** Correct Option

Solution: (D)
Ans d
Explanation: a. The special flow label 0 means the packet does not belong to any flow (using this scheme).

Q.5) Max Marks: 1

What will be the length of maximum burst in sec where the capacity of the router is 10MB. The maximum output rate of the router is 20 MBPS and the token rate is 12 MBPS.

Correct Answer

Solution: (1.25)

Ans 1.25

Explanation:

C + PS = MS

(10 * 10^6 * 8) + (12 * 10^6 * 2 ^3)S = (20 * 10^6 * 2 ^3)S

S = 1.25 sec

Q.6) Max Marks: 1

Which of the following option is true:

A **Flooding is the dynamic algorithm.**

B **BGP, RIP, OSPF are the protocols used in dynamic routing.** Correct Option

Solution: (B)
Ans b
Explanation:
a. Flooding is the static algorithm.
b. BGP, RIP, OSPF are the protocols used in distance-vector, link-state routing which is a dynamic algorithm.
c. Split horizon used to solve the count to infinity problem.
d. BGP(Border gateway protocol) used in path-vector routing.

C **Using split horizon in distance vector the count to infinity can occur.**

D **BGP is used in Link-state routing.**

Q.7) Max Marks: 1

In IPV6 the lower 64-bit suffix of the Link-local address is derived from the?

A **DHCP server**

B **Mac address** Correct Option

Solution: (B)
Ans b
Explanation: The lower 64 bits of the link-local address (the suffix) were originally derived from the MAC address of the underlying network interface card.

C **ISP address**

D **Private IP address**

Q.8) Max Marks: 1

Loops are prevented in the path taken by packets in a BGP network because:

A **Routers in a BGP network use Dijkstra's algorithm to build a spanning tree.**

B **Operators construct their network so there are no loops.**

C **Packets carry a list of routers visited and are dropped if they visit the same router twice.**

D **Advertised paths contain a list of the (Autonomous system)AS's that a packet will visit, and a sending router will not send a packet along a path with a loop.** Correct Option

Solution: (D)
Ans d
Explanation: Path vector routing provides loop prevention. It checks whether the looping is involved while visiting the AS. If looping is involved then the network path pair is discarded.

Q.9) Max Marks: 1

Consider the following statements are not correct.

St-1 Packet Switching is faster than circuit switching.
St-2 EOP option in IP header is used to fill the gap in the row.
St-3 NOP operation is used for the separation of header and data.
St-4 The sender window size in GO back N ARQ SWS<= 2^(m-1)

A 2,4 only

B 1,4 only

C 1,3,4 only

D 2,3,4 only — Correct Option

Solution: (D)
Ans d
Explanation: St 1: Packet switching is faster than circuit switching because we are not wasting time in connection establishment.
St 2: NOP is used to fill the gap in the row.
St 3: EOP is used for the separation of header and data.
St 4: The SWS in GBN is (2^m -1).

Q.10) Max Marks: 1

"Layering" is commonly used in computer networks because:

A **It forces all network software to be written in ANSI 'C'.**

B **Encapsulation is the lowest overhead method to transmit data.**

C **It allows widespread code and implementation re-use.** — Correct Option

Solution: (C)
Ans C
Explanation: The purpose of layering is to provide easy re-use and implementation.
Option a cannot be the answer because network software can be written in languages apart from ANSI 'C'.
Option b cannot be the answer because Encapsulation cannot guarantee lowest overhead with respect to layering.
Option d cannot be the answer because we cannot say by layering that the system will run faster.

D **It keeps networks warm enabling them to run faster.**

Q.11) Max Marks: 2

Pick the correct statement about flooding

1. **It is a type of isolated routing**
2. **It is a method in which every incoming packet is sent out on every outgoing line except the one by which it arrived.**
3. **Flooding only selects the shortest path while sending the data.**
4. **Selective flooding is a type in which the packets are sent to those lines that are going approximately in the right direction.**

A **Only statements 2 and 3 are correct**

B **Only statements 1 and 2 are correct**

C **All statements are correct**

D **Only statements 1, 2 and 4 are correct** — Correct Option

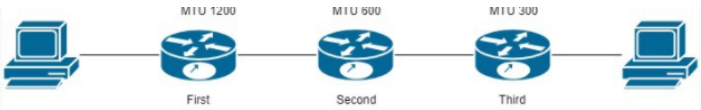
Solution: (D)
Sol: D
Explanation:
Isolated routing: There is no control center, but all nodes are peer: each node decides its paths autonomously without exchanging information with other routers. Similarly, flooding doesn't depend on anybody and takes its decisions by sending the packets to all links
Selective flooding: A variant of flooding called selective flooding partially addresses these issues by only sending packets to routers in the same direction. In selective flooding, the routers don't send every incoming packet on every line but only on those lines which are going approximately in the right direction.

Q.12) Max Marks: 2

We are sending a packet from one host to another host. The first host sends the packet to the first router, the first router sends the packets to the second router, the second router sends the packets to the third router and after it went to the second host. The maximum transfer unit of each router is 1200 B, 600 B, 300 B. The size of the IP header is 20 B. Calculate the total overhead due to IP header from first IP header to last IP header in the entire network when the size of the packet is 2600 B without header?

Correct Answer

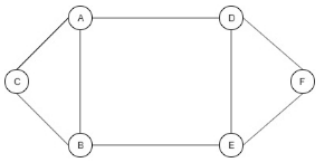
Solution: (420)
H1 H2



For First router = Total fragments = 2600/1180 = 2.20 = 3 fragments.
F1 = 1176 + 20(header)
F2= 1176 + 20(header)
F3= 248 + 20(header)
For Second router [Total 6]
F1 = 1176 / 580= 2.02 = Three fragments
F11= 576 + 20
F12= 576 + 20
F13= 24 + 20
F2 = 1176 / 580= 2.02 = Three fragments
F21= 576 + 20 (header)
F22= 576 + 20 (header)
F23= 24 + 20(header)
For F3 there will be no fragment.
So total overhead = 20 x 6 = 120
For third router [12 frag]
F11 = 576/280 = 2.05 = 3 frag
F12= 576/280=2.05= 3 frag
For F13 no fragment
F21= 576/280=2.05= 3 frag
F22= 576/280=2.05= 3 frag
For F23 no fragment
For F3 no frgament
So total overhead= 21 frag x 20 bytes = 420

Q.13)

Max Marks: 2



The distance vector routing algorithm is used. Router A has measured its routes to its neighbors B, C and D as 3, 7 and 2 respectively. A has received the following vectors from node B: (A, B, C, D, E, F) [3, 0, 1, 4, 7, 5], from node C: (A, B, C, D, E, F) [7, 4, 0, 6, 8, 7] and from node D: (A, B, C, D, E, F) [2, 5, 7, 0, 4, 2]. Which of the following is the new routing table at router A?

A

To	Next Hop	Distance
A	-	0
B	B	3
C	C	7
D	D	2
E	D	6
F	D	4

B

Correct Option

To	Next Hop	Distance
A	-	0
B	B	3
C	B	4
D	D	2
E	D	6
F	D	4

Solution: (B)

Ans b

Explanation: Initially router A knows its immediate neighbor routers. The table for A is

TO	Next hop	Distance

A	A	0
B	B	3
C	C	7
D	D	2
E	..	∞
F	..	∞

Now after having the vector table of B, C, D

B [3 0 1 4 7 5] C [7 4 0 6 8 7] D [2 5 7 0 4 2]

The first entry of A table will remain the same because the minimum distance from A will be from A only.

The second entry of A table min dest B { 3 + 0 [via B] , 7 + 4 [via C] , 2 + 5[via D]} = 3(via B)

The third entry of A table dest C min{3+ 1 [via B], 7 + 0 [via C], 2 +7[via D] } = 4 (via B)

The fourth entry of A table Dest D min{ 3 + 4 [via B] , 7+6[via C], 2+0[via D]}= 2 (via D)

The fifth entry of A table Dest E min{ 3 +7[via B], 7+8[via C], 2+4[via D] }= 6(via D)

The sixth entry of A table Dest F min{ 3 +5 [via B], 7+7 [via C], 2+2[via D] }= 4 (via D)

C

To	Next Hop	Distance
A	-	0
B	B	3
C	B	4
D	D	2
E	B	10
F	D	4

D

To	Next Hop	Distance
A	-	0
B	B	3
C	C	7
D	D	2
E	B	10
F	D	4

Q.14) Max Marks: 2

An IP router having the maximum transfer unit (MTU) is 2000 Bytes including header. We are sending a packet of 8465 Bytes and also header of 20 Bytes to the destination. The router is fragmenting the packets according to it's MTU. What will be the values for the fourth fragments.

A **Size of fragment = 1980 ,DF=1 , MF=0, Fragment Offset= 946**

B **Size of fragment = 1980 ,DF=0 , MF=1, Fragment Offset= 745**

C **Size of fragment = 1976 ,DF =0, MF=1 ,fragment Offset = 741** Correct Option

Solution: (C)
Ans C.
Explanation: Number of fragments possible= 8465 / 1980 = 4.2 = 5 fragments required.
First packet size will be = 1976 + 20 Bytes header, FO = 0 - 246
Second packet size will be = 1976 + 20 Bytes header, FO = 247-493
Third packet size will be = 1976 + 20 Bytes header , FO = 494- 740
Forth packet size will be = 1976 + 20 Bytes header, FO = 741- 987

D **Size of fragment = 1976 ,DF=1,MF=0 Fragment Offset =900**

Q.15) Max Marks: 2

We are sending a packet from the source to the router. The router supports the maximum of M bytes of the fragment, the intermediate fragment payload size is 32 bytes. The size of the header supported is of 20 bytes, for some fragment whose (MF bit =1), what is the fragment number for an offset value is 24?

A **5**

B 6

C 7 Correct Option

Solution: (c)

Ans c

MF = 1 means intermediate fragment

Size of payload = 32 B

Offset range for 1st packet : 32/8 = 4 (0 to 3)

Fragment number of offset value 24 is 7

0 to 3 =1st
4 to 7 = 2nd
8 to 11 = 3rd
12 to 15= 4th
16 to 19= 5th
20 to 23= 6th
24 to 27 = 7th

So 7th fragment for offset 24

D 8

close