

CLASS TEST

S.No. : 03 BN_CS_A_121019

Computer Network



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CLASS TEST 2019-2020

COMPUTER SCIENCE & IT

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ANSWER KEY > Computer Network

1. (b)	7. (a)	13. (d)	19. (c)	25. (a)
2. (d)	8. (c)	14. (b)	20. (a)	26. (d)
3. (d)	9. (d)	15. (c)	21. (d)	27. (d)
4. (d)	10. (b)	16. (c)	22. (b)	28. (d)
5. (d)	11. (c)	17. (a)	23. (b)	29. (d)
6. (d)	12. (d)	18. (a)	24. (c)	30. (b)

DETAILED EXPLANATIONS

1. (b)

Given:

Number of subnets = 200 ($2^7 < 200 < 2^8$)

Number of systems per subnet = 220

Default mask for class B = 255 . 255 . 0 . 0 (i.e, 16 bits for NID and 16 Bits for HID)

Check whether $200 \times 220 < 2^{16}$

Now, $\frac{16 \text{ bits}}{\text{NID}} \quad \frac{16 \text{ bits}}{\frac{8 \text{ bits}}{\text{SID}} \quad \frac{8 \text{ bits}}{\text{HID}}}$

We can use 255 . 255 . 255 . 0

2. (d)

Option (a), (b), (c) are true

All the interfaces of the router must belong to different network.

Note: The above given statements are rules to deploy a router.

3. (d)

The respective values are 7001, 6001. For X, acknowledgement of SYN is send.

As these are only control segments, no data is shared. Only 1 sequence number is consumed. Hence 7001, 6001 is correct answer. For Y, acknowledgement fo FIN is send.

4. (d)

TCP provides flow control, error control whereas UDP donot provide flow control and error control.

∴ TCP is reliable and UDP is unreliable.

Packet processing delays depends upon the capacity and capability of router. Therefore, the processing speed is differs.

All the statements (a), (b) and (c) are true.

5. (d)

Intra Domain Routing Protocols

(i) **RIP:** Routing Information Protocol (D.V.R. Algorithm)

(ii) **OSPF:** Open Shortest Path First (Link State Routing Algorithm)

Inter domain protocols

(i) **BGP:** Border Gateway Protocol (Path Vector Routing Algorithm)

6. (d)

Multipurpose internet mail extension is a supplementary protocol that allows non-ASCII data to be sent through e-mail.

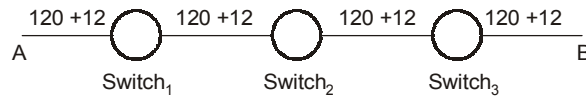
7. (a)

If there are 'n' users the number of keys required is $\frac{n(n-1)}{2}$

∴ $\frac{5 \times 4}{2} = 10$ symmetric keys are required

8. (c)
Transmission time of A for putting packet on to the ethernet,

$$\frac{1500 \times 8}{10^8} = 120 \mu\text{s}$$



The time needed for last bit of packet to propagate to the first switch is $12 \mu\text{s}$. The time needed for first switch to transmit the packet to second switch is $(120 + 12) \mu\text{s}$ and the same happens for remaining switches, each segment introduces a $120 \mu\text{s} T_{\text{delay}}$, $12 \mu\text{s} P_{\text{delay}}$.
Thus, total latency = $(120 + 12) + (120 + 12) + (120 + 12) + (120 + 12) = 528 \mu\text{s}$.

9. (d)

$$\begin{aligned} P(\text{of 2 stations}) &= {}^5C_2 \times P_{(\text{transmitting})}^2 \times P_{(\text{not transmitting})}^3 \\ &= {}^5C_2 (0.4)^2 (0.6)^3 \\ &= 10 \times 0.16 \times 0.216 = 0.3456 \end{aligned}$$

10. (b)

Burst length of computer is given by

$$S = \frac{C}{M - e}$$

↖ Bucket capacity
↙ Output rate ↘ Bucket fill rate

$$S = \frac{20 \times 10^6}{10 \times 10^6 - 2 \times 10^6} = 2.5 \text{ seconds}$$

11. (c)

- A gate way is a computer, so it might have the capacity to do anything to network bits/pieces.
- Sometime switches have routing capability but bridge never have routing capability.
- Repeater occurs only at physical layer.
- Only gateway can connect different protocol networks.

12. (d)

DES is a block cipher (operates on a fixed block of bits). It encrypts a 64-bit of plain text using a 64-bit key. But only 56 bits used as last bit of every byte is a parity bit. 3-DES uses 112 or 168 bits.

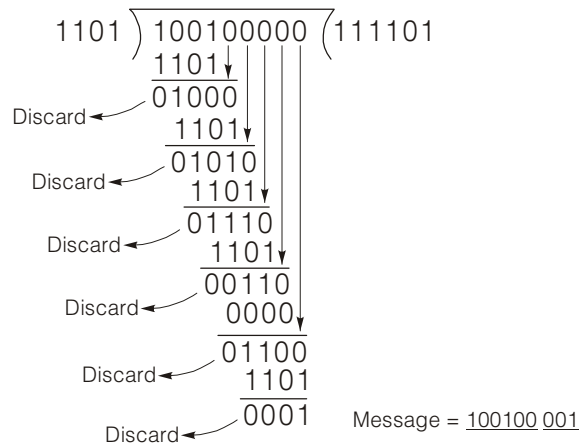
13. (d)

- TCP involves a connection establishment phase while UDP does not. Using TCP for DNS may end up involving several TCP connections to be established since several name server may have to be contacted to translate a name into an IP address. This imposes a high overhead in delay. Hence DNS uses UDP for its query and response messages.
- SMTP is a push protocol, whereas the given task is pull operation.
- S_3 and S_4 statements are correct.

14. (b)

→ CRC polynomial is the divisor and the message is dividend. The remainder is added to the message and then it is send.

→ CRC is always 1 bit < divisor. 1st bit is always discarded.



Append the remainder to the message. It is called as CRC message.

15. (c)

For pure aloha maximum throughput is 18.4%
For slotted aloha maximum throughput is 36.8%

$$\therefore \text{Pure aloha} = \frac{18.4}{100} \times 90 = 16.56 \text{ Kbps}$$

$$\therefore \text{For slotted Aloha} = \frac{36.8}{100} \times 90 = 33.12 \text{ Kbps}$$

16. (c)

Number of subnets = 1024
Bits required for subnet = 10
Network mask = 255 . 255 . 255 . 192
Number of hosts / subnet = $2^6 - 2$
Ranges are:

- 190.76.0.0/26 to 190.76.0.63/26 ----- 1st subnet
- 190.76.0.64/26 to 190.76.0.127/26 ----- 2nd subnet
- 190.76.0.128/26 to 190.76.0.191/26 ----- 3rd subnet
- 190.76.0.192/26 to 190.76.0.255/26 ----- 4th subnet
- 190.76.1.0/26 to 190.76.1.63/26 ----- 5th subnet
- ⋮
- 190.76.255.128/26 to 190.76.255.191/26 ----- 1023th subnet
- 190.76.255.192/26 to 190.76.255.255/26 ----- 1024th subnet

17. (a)

	A	B	C	D	E	F
Vector table of A via B =	(0	4	8	8	7	6)
Vector table of A via C =	(0	10	6	8	13	17)
Vector table of A via D =	(0	6	8	5	8	11)

Final vector table of A

Via	A	B	C	D	E	F
	0	4	6	5	7	6

(Take minimum of all)
(In case of same delay, any one of them can be chosen)

18. (a)

According to CSMA/CD,

$$\text{Transmission time} = 2 \times \text{Propagation delay}$$

$$\frac{1000}{100 \times 10^6} = \frac{2 \times L}{2 \times 10^5 \times 10^3}$$

$$L = 1000 \text{ m}$$

$$L = 1 \text{ km}$$

19. (c)

100 base 5 cable means length of the cable is 500 m and bandwidth is 100 Mbps.

According to CSMA/CD Transmission delay = $2 \times$ Propagation delay (P_d)

$$P_d = \frac{d}{v} = \frac{500 \text{ m}}{2 \times 10^8 \text{ m/s}} = 2.5 \mu \text{ sec.}$$

$$\frac{\text{Frame size}(x)}{\text{Bandwidth}} = 2 \times \frac{d}{v}$$

$$\Rightarrow x = 2 \times 2.5 \mu \text{ sec} \times 100 \text{ Mbps}$$

$$= 500 \text{ bits}$$

20. (a)

Window size [WS = 1] initially

⇒ After 1 RTT, window size = 2 and 1 segment is sent

⇒ After 2 RTT, window size = 4 and 3 segment sent in total

⇒ After 3 RTT, window size = 8 and 7 segment sent in total

⋮

⇒ After 'X' RTTS, window size = 2^x and $2^x - 1$ segment are sent

$$\text{Now, } 2^x - 1 = 3999$$

$$2^x = 4000$$

$$x = \log_2(4000)$$

$$\boxed{x = 12 \text{ RTT's}}$$

21. (d)

Both are false as destination host lies out side the network, as specified by the destination IP.

22. (b)

- 0.0.0.0/0 is used to identify all networks and is referred to as default route.
- 0.0.0.0/32 is a IP address, which is used by a host when dynamically attempting to learn it's IP address via DHCP.
- 169.254.X.X/16 range is ensured for automatic private IP addressing. A host assigns itself an address in this range, if it cannot dynamically obtain an address from DHCP server.
- 224.X.X.X - 229.X.X.X ranges are reserved for multicast and are referred to as class D addresses.

23. (b)

Persistent timer: It is designed to prevent deadlock. The receiver sends an acknowledgment with a window size of 0, telling the sender to wait. Later the receiver updates the window, but the packet with update is lost. Hence both are waiting and are in deadlock.

TIME WAIT: After this timer goes off the system will check if other side system is still there.

RTO: If ACK failed to arrive before the timer goes off, then segment is retransmitted.

Keep alive time: It runs for twice the maximum packet life time to make sure that all packets are died off when connection is closed.

24. (c)

We should choose class 'C' network as we require only 96 hosts, so it would require. Minimum of 7 bits for host id.

$\underbrace{11111111.11111111.11111111}_{\text{SubNetMast}}.\underbrace{10000000}_{7\text{bits}}$ for providing 96 hosts

Mask is 255.255.255.128

25. (a)

Telnet is used to connect to a remote computer and search the library's holding.

26. (d)

All are false. The correct statement should be

S_1 : UDP uses TFTP

S_2 : TCP uses FTP

S_3 : TCP is connection oriented service hence always uses FTP which requires FTP before the file is downloaded.

27. (d)

Since the 4th octet, has all 0's in the net mask, hence any value can be assigned to it.

Coming to the 3rd octet:

Interface-0 → 1 0 0 1 0 0 0 0

Interface-1 → 1 1 0 0 0 0 0 0

R_2 → 0 1 1 0 0 0 0 0

R_3 → 0 1 1 0 0 0 0 0

Calculating 3rd octet for each option of list-1

A. 1 1 0 0 0 1 1 1

B. 0 1 1 0 1 0 0 1

C. 1 1 1 0 0 1 1 0

D. 0 1 1 1 0 1 1 1

Comparing A with interface-1, both have common prefix. B matches its prefix with both R_2 as well as R_3 , but the maximum matching with R_2 .

Option (c) does not matches with any of the address hence belongs to default.

Option (d) matches with R_3 as both have common prefix.

28. (d)

- Statement is correct.
- DES uses 16 rounds, whereas number of rounds in AES can be 10, 12 or 14.
- Statement is correct.

29. (d)

Group of networks can be combined into single supernetwork if only the networks are continuous.

30. (b)

S_1 is wrong because, if LSP is with less recent data than the data stored in database is received, then new LSP is updated with database data and is sent back only over the link from which the first LSP was received.

