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DEPARTMENT OF INFORMATION TECHNOLOGY, NITK SURATHKAL

IT200 COMPUTER COMMUNICATION AND NETWORKING

Class: III SEM BTECH **Time: 30min.**

Date: 11/01/2023 **Marks: 10**

RollNo 211IT085.

NOTE: 1. Answer all questions (1 x 10 = 10 marks)

1. The maximum throughput possible with ALOHA protocol is _____ and Slotted Aloha is _____

(a) 28% and 37%
(b) 37% and 51%
(c) 18% and 37%
(d) 47% and 67%

2. In which of the following CSMA technique, the medium is sensed continuously if the channel is busy?

(a) Non Persistent
(b) 1-persistent
(c) p-persistent
(d) Non of the Above

3. In CSMA/CD when the collision is detected, the system sends _____

(a) choke packet
(b) jam signal
(c) ACK
(d) FIN

4. The wireless networks uses _____Medium access control

(a) Pure ALOHA
(b) CSMA/CD
(c) Slotted ALOHA
(d) CSMA/CA

5. The Vulnerable time for Slotted Aloha is _____

(a) 2 x Frame Transmission Time
(b) Frame Transmission Time
(c) Frame Transmission Time / 2
(d) 4 x Frame transmission Time

6. What is the subnet mask for the IP address 132.14.9.7/20.

To obtain subnet mask; take 32-n = 32 - 20 = 12. We must set first 20 bits of mask as 1 and last 12 as 0 as 11111111 11111111 11110000 00000000. This mask can be written as 255.255.240.0. This can be used to obtain the first and the last address

7. What is the First address and First Valid address in the network for the given IP address 132.14.9.7/20. given: 132.14.9.7/20. As in prev question, the subnet mask is 11111111 11111111 11110000 00000000 (255.255.240.0). The first address can be obtained by performing bitwise 'and' operation with 10000100.00001110.00001001.0000 and mask. ⇒ 10000100.00001110.00000000.00000000 or (132.14.0.0/20)

First address: ~~132.14.9.7/20~~ 132.14.0.0/20. First valid address: 132.14.0.1/20

8. What is the last address and Valid Last address in the network for the given IP address 132.14.9.7/20. To obtain last address OR between 00000000 00000000 00001111 1111 and 10000100 00001110 00001001 00000111 ⇒ 10000100 00001110 00001111 ⇒ 132.14.15.255/20 last valid address 132.14.15.254

9. Assume that an organization has 1,015 systems. The Organization is divided in to 3 Subnets with first 512 in Subnet1 and next 256 address in Subnet 2 and remaining nodes in subnet 3. The organization was assigned with address from 221.4.8.0 to 221.4.11.255. Show how the network ID can be represented with one single Entry in Routing Table.

nodes in subnet 3
1015 - 768
247
255.255.11111

Subnet mask (/n)	Network address	Next hop	Interface
.....10.....	.....221.4.8.0/10.....	R2	i3

255.255.252.0

221.4.8.0
222.4.00001000.0
1000.0
1000

10. Assume that 221.8.15.0 is assigned for one organization which has 250 nodes. The organization would like to create two subnets (Subnet 1 with 126 valid address nodes and remaining nodes as subnet2). Compute the network Id and subnet mask for Subnet1 and Subnet2.

Subnet1 Network id (x.x.x.x/n)= 221.8.15.0/25

Subnet1 Mask(x.x.x.x)= 255.255.255.128

Subnet2 Network id (x.x.x.x/n)= 221.8.15.128/25

Subnet2 Mask (x.x.x.x)= 255.255.255.128

250 nodes
subnet 1 : 126 valid
subnet 2 : 124 valid
n = 7 for subnet 1, subnet 1, and subnet 2
network id: 221.8.15.0/25
subnet 2 network id: 221.8.15.128
address in
22
221.8.15.0
255.255.255.0
11111
11110000