Advanced Computer Networks M24 Midsem

[2 Marks]

A. Protocol Data Unit at different OSI Layer is called:
Appl/Pres/Ses: *Message*
Transport: *Segment*
Network: *Packet*
Data Link: *Frame*
Physical: *Bit/Byte*

[2+2+2+4=10 Marks]

B. An organization is granted the block 131.21.0.0/18. The admin wants to create 2048 subnets. For the 256th subnet, compute:
   1. Find the prefix size. Show computations. *29*
   2. Find the subnet mask. Show computations *255.255.255.248*
   3. Number of maximum hosts possible in it. Show computations. *6*
   4. Its first and last addresses (in slash notation). Show computations.

[2 Marks]

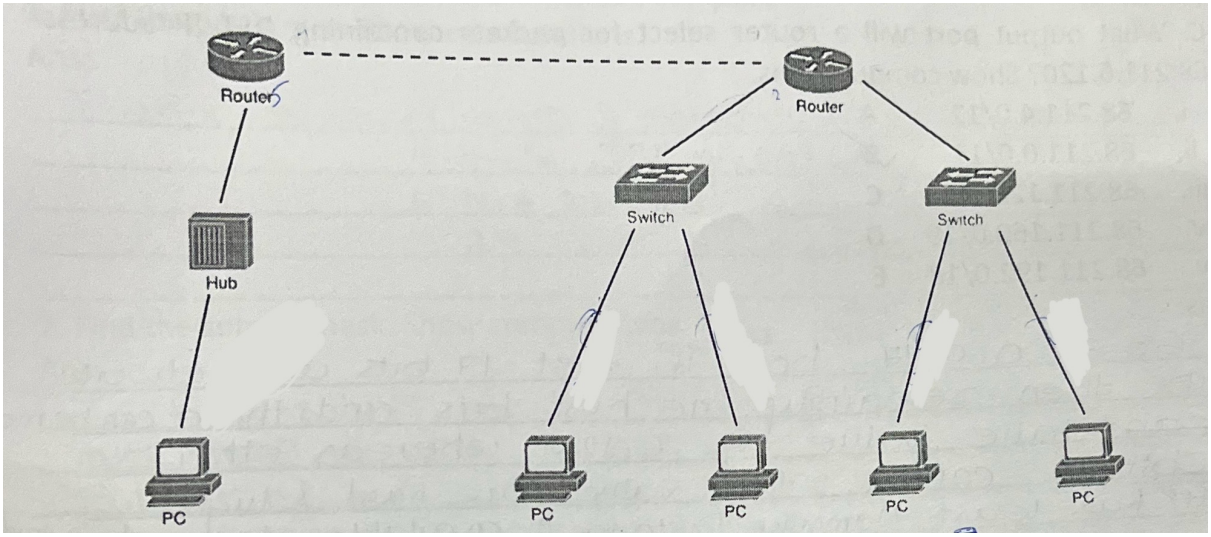
C. What output port will a router select for packets containing DST IP address 68.211.6.120? Show computations.
   i. *68.211.4.0/12* ***A***
   ii. 68.211.0.0/17 **B**
   iii. 68.211.128.0/19 **C**
   iv. 68.211.160.0/19 **D**
   v. 68.211.192.0/18 **E**

[1+2+1=4 Marks]

D. When a host is unable to get an IP address from DHCP (or the primary configuration method) AND no IP address is assigned manually, it takes an IP from a special range of addresses.
   1. Give the name and range of such address *Link Local Address – 168.254.x.x*
   2. What protocol does a host utilize to validate the uniqueness of the IP address it has chosen. And, how does it work? *ARP- Address Resolution Protocol*
   3. Can a host with such an IP address ping www.google.com? Justify *No*

[1.5+1.5 = 3 Marks]

E. Find the number of broadcast domains and collision domains in the network shown in the figure



Broadcast Domain : *4*
Collision Domain: *8*

[3+3+3=9 Marks]

F. Fill in the table

Class	**Leading Bits**	**# of Networks**	**# of Host ID Bits**	**# of Networks**	**Hosts per Network**	**Total addresses in Class**	**Start Address**	**End Address**	**Default Subnet Mask**
A	*0*	*8*	*24*		*2^24 -2*	*2^24*	*1.0.0.0*	*128.255.255.255*	*255.0.0.0/8*
B	*10*	*16*	*16*		*2^16 -2*	*2^16*	*128.0.0.0*	*191.255.255.255*	*255.255.0.0/16*
C	*110*	*24*	*8*		*2^8 - 2*	*2^8*	*192.0.0.0*	*223.255.255.255*	*255.255.255.0/24*