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**End Semester Examination (Nov, 2023)**  
**(Class: Dual Degree (CSE), Semester: 9<sup>th</sup>)**

*17/11/2023*  
*(X)*  
*(180)*

**Subject: CS-611: Topics in Computer Networks**

Max Marks: 50

Date: 17.11.2023

Time: 9:30AM – 12:30AM

1. A large number of consecutive IP addresses are available starting at 198.16.0.0. Suppose that four organizations, A, B, C, and D, request 4000, 2000, 4000, and 8000 addresses, respectively, and in that order. For each of these, give the first IP address assigned, the last IP address assigned, and the mask in the w.x.y.z/s notation. 5
2. A router has the following (CIDR) entries in its routing table:

Address/Mask	Next hop
135.46.56.0/22	Interface 0
135.46.60.0/22	Interface 1
192.53.40.0/23	Router 1
default	Router 2

For each of the following IP addresses, what does the router do if a packet with that address arrives? 9

- (a) 135.46.63.10  
(b) 135.46.57.14  
(c) 135.46.52.2  
(d) 192.53.40.7  
(e) 192.53.56.7
3. What is Open Shortest Path First (OSPF) protocol? How do routers use OSPF message to broadcast information about the status of its directly connected links to all other routers? How various areas are organized in ASes and how various routers are designated? 9
4. Explain MultiProtocol Label Switching (MPLS). Clearly explain the roles of Label Switched Router (LSR) and Label Edge Router (LER). What is FEC and why is it created? 9
5. Explain Border Gateway Protocol (BGP). What is multihoming and when is it needed? With clear example show how routes are advertised in BGP. Also, explain hot potato routing? 9
6. Explain TCP and UDP in detail. Compare and contrast them based on various parameters/techniques and also give main advantage of using UDP over TCP. What is head-of-line blocking? What causes it? 9