FAST NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES KARACHI CAMPUS

Assignment#3
Submission Deadline: 3rd May,24

Submission Guidelines: Max mark: 35

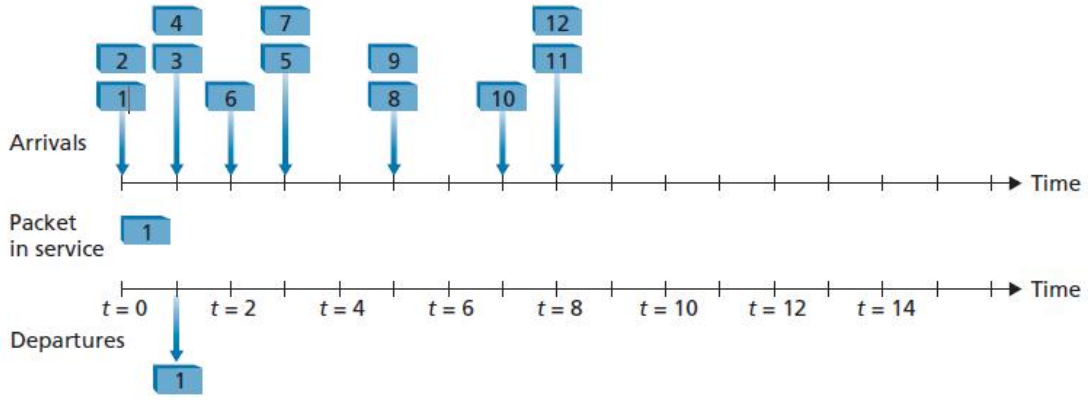
Handwritten assignments need to be submitted in pdf format.

- Write your name, roll number and section on top of the first page of the assignment.
- **Submission deadline by 3rd May 2024. All the submission will be via Google Class Room.**
- **Email submission will not be considered.**
- **Plagiarism will be treated strictly. Marks will be reduced for assignment that have found in plagiarism.**
- Penalties for late submission of assignment:
  - o 50% reduction will be applied for submissions made 24 hours after the deadline
  - o No awards will be granted 48 hours past the deadline.

Q1. a) Describe the concept of Software Defined Networks? How can we differentiate it with traditional network? **(2.5+2.5)**

b)We have discussed three types of switching fabrics in router. Briefly describe each type with illustration. You also need to mention which Cisco series use the specific switching fabric? **(2+2+2)**

c) You need to schedule network packets using FIFO service. You also need to indicate the time at which packets 1 through 12 each leave the queue. For each packet, what is the delay between its arrival and the beginning of the slot in which it is transmitted? What is the average delay of over all 12 packets? **(2.5+2.5)**



Q2. a) Explain the concept of Classful addressing in IPv4. You need to mention different classes of IPv4 addresses (Class A, Class B, Class C, Class D, and Class E) and their respective private address range if applicable. **(1*5=5)**

b)Describe the concept of VLSM (Variable Length Subnet Mask). You are configuring a network device with the IP address 192.168.10.160 and a subnet mask of 255.255.255.224. Determine the number of sub-network bits, number of host bits,number of usable address per subnetwork. **(2+3)**

c)Suppose datagrams are limited to 1,500 bytes (including header) between source Host A and destination Host B. Assuming a 20-byte IP header, how many datagrams would be required to send an MP3 consisting of 48,840bytes? Explain how you computed your answer.**(5)**

Q3. Consider a datagram network using 32-bit host addresses. Suppose a router has four links, numbered 0 through 3, and packets are to be forwarded to the link interfaces as follows: **(2+2)**

Destination Address Range	Link Interface
11100000 00000000 00000000 00000000 through 11100000 00111111 11111111 11111111	0
11100000 01000000 00000000 00000000 through 11100000 01000000 11111111 11111111	1
11100000 01000001 00000000 00000000 through 11100001 01111111 11111111 11111111	2
otherwise	3

a)Suppose a datagram arrives at the router, with destination address 11001000 10010001 01010001 01010101. To which interface will this datagram be forwarded using longest-prefix matching?

b)Suppose a datagram arrives at the router, with destination address 11100001 01000000 11000011 00111100. To which interface will this datagram be forwarded using longest-prefix matching?