University of Engineering & Management, Kolkata

Even Semester Term- I Examination, March, 2021

Course: B.Tech(CS) **Semester:4th**

Paper Name: Computer Networks

Paper Code: PCC-CS404

Full Marks: 70 **Time: 2 hours**

Answer all questions. Each question is of 10 marks.

1. **A)** What is topology? Explain why do we need n(n-1)/2 number of links in mesh topology?

OR

B) i) A host with IP Address 175.110.10.10 wants to send a packet to all the hosts in the same network. What will be source ip address and destination ip address ?
ii) Suppose that instead of using 16 bits for network part of a class B Address, 23 bits have been used. How many class B networks would have been possible?

2. **A)** Why are protocols needed? Explain the function of TCP/IP protocol.

OR

B) Explain about limited broadcasting and directed broadcasting.

3. **A)** What are the three criteria necessary for an effective and efficient network? Assume 6 devices are arranged in a mesh, star, bus topology. How many cables are needed for each of the cases?

OR

B) Identify the Class, Network IP Address, Direct broadcast address and Limited broadcast address of each IP Address.
i) 156.11.124.120
ii) 202.22.15.15

4. **A)** Explain the operation of Data Link Layer and Network Layer.

OR

B) What is the difference between logical Address and physical address? Explain about classful addressing.

5. A) Compare Connection oriented and connectionless service.

OR

B) . i) A host with IP Address 15.115.110.90 wants to use loop back testing. What will be source IP and destination IP address ?
ii) Change the following IPv4 address in hexadecimal notation.
a. 10000001 00001011 00001011 11101111
b. 11000001 10000011 00011011 11111111

6. A) Explain the ISO-OSI model of computer network with a neat diagram and name different topologies used in each layer with its functionality.

OR

B) Identify the Class, Network IP Address, Direct broadcast address and Limited broadcast address of each IP Address.
i) 15.14.24.74
ii) 127.10.20.35

7. A) Define bandwidth. A nonperiodic composite signal has a bandwidth of 100 kHz, with a middle frequency of 200 kHz and peak amplitude of 10 V. The two extreme frequencies have an amplitude of 0.Draw the spectrum of the signal.

OR

B) Explain Nyquist Sampling theorem. . A digitized voice channel, is made by digitizing a 4-kHz bandwidth analog voice signal. We need to sample the signal at twice the highest frequency (two samples per hertz). We assume that each sample requires 8 bits. What is the required bit rate?