Time: 3 Hours **Marks: 80**

Note: Q.N. 1 is compulsory. Solve any three from Q.N. 2 to Q.N. 6

Q1. Solve any Four out of Five **(5*4=20 marks)**

a. Explain the need of layering in reference model for communication and networking?
b. Explain one bit sliding window protocol.
c. Explain IPv4 header format with diagram.
d. Differentiate between TCP and UDP.
e. What is the need of DNS? Explain DNS Name Space.

Q2. Attempt the following **(10*2=20 marks)**

a. Explain following transmission medias - Twisted Pair, Coaxial Cable (baseband and broadband), Fiber Optic.
b. What is channel allocation problem? Explain CSMA/CD protocol. Consider building a CSMA/CD network running at 1Gbps over a 1-km cable with no repeaters. The signal speed of the cable is 200,000 km/sec. What is the minimum frame size?

Q3. Attempt the following **(10*2=20 marks)**

a. Explain Classful and Classless IPv4 addressing.
b. Explain TCP connection establishment and TCP connection release.

Q4. Attempt the following **(10*2=20 marks)**

a. Explain Selective Repeat Protocol for flow control.
b. Explain shortest path (Dijkastra's Algorithm) routing algorithm.

Q5. Attempt the following **(10*2=20 marks)**

a. A large number of consecutive IP address 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.
b. Explain Slow-Start algorithm for TCP's congestion handling policy.

Q6. Attempt the following **(10*2=20 marks)**

a. Explain DHCP message format and its operation in detail.
b. Explain ARP protocol in detail.

****

D4EE16A5EA4143634BC4E902478BE96B