

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
 Test-1, EXAMINATION SEPTEMBER-2015
 B.Tech VIIth Sem & M.Tech. Ist Sem (CSE)

COURSE CODE: 10M11CI12
 COURSE NAME: Advanced Computer Networks
 COURSE CREDITS: 03

MAX. MARKS: 15

MAX. TIME: 1 HRS

Note: All questions are compulsory. Carrying of mobile phone during examination will be treated as a case of unfair means.

1. (a) Draw the ATM UNI cell format? [1]
 (b) PPP is based closely on HDLC, which uses bit stuffing to prevent accidental flag bytes within the payload from causing confusion. Give at least one reason why PPP uses byte stuffing instead. [1]
 (c) Wireless networks are easy to install, which makes them inexpensive since installation costs usually far overshadow equipment costs. Nevertheless, they also have some disadvantages. Name two of them. [1]
 (d) The IEEE 802.16 supports four service classes. Which service class is the best choice for sending uncompressed video? [1]
 (e) Discuss the Hidden and Exposed station problems in wireless LAN? [1]
2. Explain the ATM reference model in brief? How it differ from OSI reference model. [2]
3. Derive an expression for the end-to-end delay? Compare the delay in sending an x-bit message over a k-hop path in a circuit-switched network and in a (lightly loaded) packet-switched network. The circuit setup time is s sec, the propagation delay is d sec per hop, the packet size is p bits, and the data rate is b bps. Under what conditions does the packet network have a lower delay? [2]
4. Discuss the functions of each SONET layer with STS-1 frame format in brief. [2]
5. Design a bidirectional algorithm for the Selective-Repeat ARQ Protocol using piggybacking. Calculate the link utilization for the selective repeat flow control mechanism having data frame size is 1000 bytes, propagation time is 40 ms, BER = 1×10^{-5} and the data rate is 2 Mbps. The window size is (a) W = 7, (B) W = 127 [2]
6. Give two reasons why networks might use an error-correcting code instead of error detection and retransmission. In the figure shown below, frames are generated at node A and sent to node C through node B. Determine the minimum transmission rate required between nodes B and C so that the buffers of B are not flooded, based on the following assumptions: 1. The data rate between A and B is 100 kbps. 2. The propagation delay is 10 μ sec/km for both lines. 3. There are full-duplex lines between the nodes. 4. All data frames are 1000 bits long; ACK frames are separate frames of negligible length. 5. Between A and B, a sliding window protocol with a window size of 5 is used. 6. Between B and C, stop-and-wait is used. 7. There are no transmission errors. [2]

