

College of Engineering, Pune
End Semester Exam – November 2013
Final Year B. Tech. (E & TC)
(ET 402)- (Computer Networks)

Day & Date-
Maximum Marks: 60

/11/2013

Time: -
Duration – 3 Hrs.

Instructions:

- 1) All the major questions are compulsory. Attempt not more than THREE sub-questions from each question.
- 2) Neat Diagrams must be drawn wherever necessary.
- 3) Assume suitable data, if necessary.
- 4) Figures to the right indicate full marks.

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- Q 1 A With the help examples, demonstrate the multiplexing and de-multiplexing functionality as followed in UDP and TCP both. What are the well-known port numbers? (05)
- B Consider a noisy channel which can either corrupt bits or drop packets. In view of reliable data transfer, sender transmits a packet and waits for its acknowledgement. List the possible events that can take place at both the sender and receiver side. Also specify the necessary actions to handle these events. (05)
- C List the side effects of network congestion. Draw the nature of congestion window and explain the regions of operations of TCP Tahoe and Reno versions. (05)
- D Is the timeout interval in TCP static? How does TCP set timeout interval? How many timers are utilized by TCP to handle transmitted but unacknowledged segments? (05)
- Q 2 A How can network application designer access the TCP/IP stack available on end systems? Explain the different types of architectures used to develop network applications. What are the pros and cons of these architectures? (05)
- B With the help of examples, bring out the differences between persistent and non-persistent connections used by web application. Also comment on the delays incurred in downloading the objects from the web-servers using either persistent or non-persistent connections. (05)
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- C What are the two types of connections used by FTP? Justify the need of these different types of connections. List and briefly explain any four commands supported by FTP protocol. (05)
- D What is the utility of distributed hash tables (DHT)? How are the records stored in DHTs? How does circular DHT solve the issue of scale? (05)
- Q 3 A List and briefly explain any five services that link layer may provide to the upper layer. (05)

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- B What is multiple access protocol? What are the desirable characteristics of multiple access protocol? Specify the different categories of multiple access protocols and the underlying principle of the categorization. (05)
- C Draw an isolated LAN and a LAN that is connected to other network. What is LAN address? What is the meaning of 100BASE-T? (05)
- D What are the constituent fields of PPP data frame? Which fields can be omitted from the frame without affecting the desired performance? What is the necessity of byte stuffing in PPP? Explain with the help of example. (05)
- Q 4 A Draw a network showing hosts and mesh of routers. With the help of drawing, explain the principle of operation in datagram switched networks. How is the forwarding table utilized by router? How and why is it necessary to optimize size of the forwarding table? What is the longest prefix matching rule? (05)
- B Draw the diagram showing necessary blocks of a router. What is the functionality of switching fabric available inside a router? Draw and explain any three techniques to build the switching fabric. (05)
- C Explain the IP fragmentation and reassembly process followed in IPv4. A datagram of 6000 bytes arrives at a router which must be forwarded to a link with a MTU of 1500 bytes. Specify maximum size of data field in the IP datagram. Find out the required number of fragments with details such as offset to forward such oversized (6000 bytes) datagram. (05)
- D With respect to hierarchical routing, what is an autonomous system? Classify the routers in the autonomous systems based on their responsibility of forwarding the packets. Draw a network showing interconnected autonomous systems. How a router in such network does prepare its forwarding table? What is hot potato routing? (05)
