

Code No: R31052

R10

Set No: 1

III B.Tech. I Semester Supplementary Examinations, May - 2013

**COMPUTER NETWORKS**

(Common to Computer Science and Engineering & Information Technology)

**Time: 3 Hours**

**Max Marks: 75**

Answer any FIVE Questions  
All Questions carry equal marks

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1. (a) What is data communication? List and explain the five components of a data communication system, with examples.  
(b) Discuss the ISO - OSI layered model, bringing out the functionalities of each layer.
2. (a) By considering a fiber optic transmission system, explain how wavelength division multiplexing (WDM) can be used to increase the data carrying capacity.  
(b) Define Frequency Division Multiplexing and de-multiplexing process in detail?
3. (a) Find the code word  $c(x)$  for the data  $d(x) = x^3 + 1$  with a generator polynomial  $t(x) = x^3 + x + 1$   
(b) Define Internet checksum? With an example list the steps undertaken by the sender and the receiver for error correction.
4. (a) With a neat diagram, explain Go-Back-N ARQ.  
(b) Explain the frame format and transmission phases of point-to-point protocol.
5. (a) A network transmit 200 bit frame on a shared channel of 200 kbps. For aloha and slotted aloha. What is the  
(i) Requirement to make the frame collision free.  
(ii) Throughput if the system produces 1000 frames/sec.  
(b) Define channelization and explain its three protocols.
6. (a) What frequency ranges are typically used by IEEE 802.11 Wireless LANs and what other types of equipment also use some of those frequency ranges.  
(b) Explain 802.3 MAC frame format, with a neat sketch?
7. Explain in detail about three categories of satellites.
8. Explain the concept of Virtual LANs in detail.

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1. In a Local Area Network, personal computers (PCs) are connected to a switch. Consider two PCs communicating with each other via this switch. Produce a protocol layer diagram that shows how data is passed between these two PCs and in which you clearly show all of the layers of the ISO OSI Reference Model that are used within each PC and within the switch. Clearly mark on this diagram what is meant by a peer to peer protocol.
2. Explain synchronous and statistical time division multiplexing in detail.
3. (a) Outline how the cyclic redundancy count (CRC) method functions.  
(b) Under what circumstances is the use of cyclic redundancy counts (CRC) an appropriate error control technique.
4. (a) Explain selective repeat ARQ, justify how selective repeat outperforms Go-Back-N ARQ.  
(b) With a neat sketch, explain the frame format of HDLC.
5. Briefly explain the following
  - (a) CSMA
  - (b) CSMA/CD
6. (a) Describe the issue known as the “hidden station problem”.  
(b) Discuss how the use of “distributed coordination function with request to send / clear to send” (DCF with RTS/CTS) helps to solve the hidden station problem.
7. With a neat sketch, explain the architecture for Bluetooth technology.
8. Explain the working mechanism of bridges devices used to connect LANs.

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1. The OSI Reference Model defines seven protocol layers, each of which is responsible for a specific range of functions. By considering this model, explain the main functions performed by a protocol operating at:
  - (a) The Physical layer
  - (b) The Network layer
  - (c) The Transport layer
  - (d) The Application layer
2. Explain the following
  - (a) Circuit Switched Networks
  - (b) Datagram Networks
3. Explain Data link layer protocols in detail.
4. Explain point-point protocol frame format. Briefly describe different transition phases of PPP in establishing a connection from home PC to ISP.
5. Explain HDLC Protocol in detail.
6. WLANs can have higher bit error rates than wired networks.
  - (i) Explain why this can be true?
  - (ii) Explain what the MAC does to reduce this problem?
7. Explain the protocol stack and frame structure of Bluetooth.
8. How does a virtual LAN help in providing the security and reduce the network traffic?

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1. (a) A protocol that operates at a particular layer of the ISO OSI Reference Model adds additional bytes to the data it receives from the layer above it. These additional bytes are often referred to as the protocol header and footer or simply, the protocol overhead. By considering layer 3 of the ISO OSI Reference Model, explain what might be included within these protocol overhead bytes.  
(b) Describe with neat diagram, the functionalities of each layer in TCP/IP model?
2. (a) Differentiate between Time Division and Frequency Division Multiplexing.  
(b) Compare circuit switched and Datagram Networks.
3. With an example, explain the concept of checksum.
4. Explain selective repeat and Stop and Wait ARQ.
5. Explain in detail about different controlled Access methods.
6. Discuss 802.3 MAC frame format. Mention the restrictions imposed on minimum and maximum length of 802.3 frames.
7. Explain in detail about cellular telephony.
8. Explain the working of Source routing bridges. How are they different from spanning tree bridges?

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