Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

IV SEMESTER B.TECH. (COMPUTER AND COMMUNICATION ENGINEERING) MAKEUP EXAMINATIONS, JUNE 2017

SUBJECT: TCP/IP PROTOCOL SUITE [ICT 2254]

REVISED CREDIT SYSTEM
(21/06/2017)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A. With a neat diagram explain the TCP segment format. 5

1B. Suppose that a group of 10 stations is serviced by an Ethernet LAN. How much bandwidth is available to each station if -

i) 10 stations are connected to a 10 Mbps Ethernet hub.
ii) 10 stations are connected to a 100 Mbps Ethernet hub.
iii) 10 stations are connected to a 10 Mbps Ethernet switch. 3

1C. What is an exposed station problem? Explain. 2

2A. Suppose a router receives an IP packet containing 600 data bytes and has to forward the packet to a network with maximum transmission unit of 200 bytes. Assume that the IP header is 20 bytes long. Show the fragments that the router creates and specify the relevant values in each fragment header (i.e., total length, fragment offset, and more bit). 5

2B. With the help of TCP/IP protocol layers present at each node, show the communication at the application layer for the simple private internet given in figure Q.2B. Also discuss how many physical and logical addresses are assigned for nodes A, R1 and B and why?

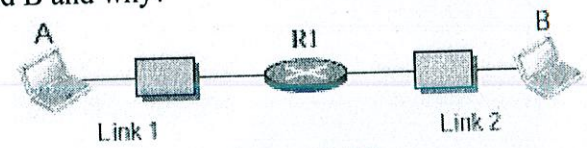

Figure Q. 2B 3

2C. A system has an n layer protocol hierarchy. Applications generate messages of length M bytes. At each of the layer an h byte header is added. What fraction of the network is filled with headers? 2

3A. Discuss the significance of various fields present in an UDP header attached with Pseudo header. Why checksum is computed over UDP pseudo header? 5

3B. An IP datagram has arrived with the following information in the header (in hexadecimal): 3

45 00 00 54 00 03 00 00 20 06 00 00 7C 4E 03 02 B4 0E 0F 02

i) Are there any options?
ii) Is the packet fragmented?
iii) What is the size of the data?
iv) Is a checksum used?
v) How many more routers can the packet travel to?
vi) What is the identification number of the packet?

3C. What is the need of 4 levels of addressing in Internet? 2

4A. A host with IP address 131.24.44.21 and physical address B2.34.55.10.22.10 has a packet to be sent to another host with IP address 131.24.44.27 and physical address A4.6E. F4.59.83. AB (which is unknown to the first host). The two hosts are on the same Ethernet network. Show the ARP request and reply packets encapsulated in Ethernet frames. 5

4B. How does forwarding module in classful addressing without subnetting works? Discuss the steps involved with relevant diagram. 3

4C. Explain prerunner protocol of DHCP with its shortcomings. 2

5A. With a timing diagram explain 3-way handshaking mechanism in TCP with illustrative messages. 5

5B. Explain how TCP/IP uses a DNS client and a DNS server to map a name to an address. 3

5C. Compare IPv4 & IPv6 headers with respect to fields. 2

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