Printed Pages—3   **EEC702**

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2727   **Roll No.** [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

B.Tech.

(SEM. VII) ODD SEMESTER THEORY EXAMINATION 2012-13

DATA COMMUNICATION NETWORKS

Time : 3 Hours   *Total Marks : 100*

Note : *Attempt all questions.*

1.   Attempt any **FOUR** parts :   **(5×4=20)**

   (a)   List the layers in the TCP/IP model, and give a brief explanation of each.

   (b)   What is packet-switching, and why is packet-switching relevant to the Internet ?

   (c)   What are the conceptual pieces of a data communications system ? Briefly explain.

   (d)   What is the difference between guided and unguided transmission ? Explain.

   (e)   Why is CSMA/CA needed in a wireless network ?

   (f)   Can a host have more than one IP address ? Explain.

2.   Attempt any **FOUR** parts :   **(5×4=20)**

   (a)   When a packet switch receives a distance-vector message from a neighbour, will the switch's forwarding table always change ? Explain.

(b) What is the conceptual difference between IP and end-to-end protocols ? Explain.

(c) List the features of UDP and calculate the size of the largest possible UDP message.

(d) How does TCP handle packet loss ? Explain by giving a suitable example.

(e) Name two technologies used to increase the speed of routers and switches.

(f) List the major features of IPv6, and give a short description of each.

3. Attempt any **TWO** parts : (10×2=20)

(a) How long does it take a packet of length 1,000 bytes to propagate over a link of distance 2,500 km, propagation speed $2.5*10^8$ m/s, and transmission rate 2 Mbps ? More generally, how does it take a packet of length L to propagate over a link of distance d, propagation speed s and transmission rate R bps ? Does this delay depend on packet length ? Does this delay depend on transmission rate ? Explain.

(b) What is silly window syndrome ? If the TCP round-trip time, RTT, is currently 30 msec and the following acknowledgments come in after 26, 32 and 24 msec, respectively, what is the new RTT estimate using the Jacobson algorithm ? Use $\alpha = 0.9$.

(c) What is congestion control ? Analyze the advantages and disadvantages of performing congestion control at the transport layer, rather than at the network layer.

4. Write short notes on any **TWO** of the following :

$$(10\times2=20)$$

 (a) Routing Algorithms

 (b) IPV$_6$ *Vs* IPV$_4$

 (c) IEEE 802.11

5. Attempt any **FOUR** parts : $(5\times4=20)$

 (a) DNS uses UDP instead of TCP. If a DNS packet is lost, there is no automatic recovery. Does this cause a problem, and if so, how is it solved ?

 (b) Could IP be redesigned to use hardware addresses instead of the 32-bit addresses it currently uses ? Why or why not ?

 (c) A TCP entity opens a connection and uses slow start. Approximately how many round-trip times are required before TCP can send N segments ?

 (d) A TCP machine is sending full windows of 65,535 bytes over a 1-Gbps channel that has a 10-msec one-way delay. What is the maximum throughput achievable ? What is the line efficiency ?

 (e) Users view the Internet as a single network. What is the reality, and to what does a user's computer attach ?