M.Tech Odd Semester (CBCS) Exam.,
December—2017

COMPUTER SCIENCE AND ENGINEERING

(1st Semester)

Course No. : MCSECC–01

(Computer Networks)

Full Marks : 50
Pass Marks : 15

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer *any* **five** questions

1. What are different metrics to measure the performance of a network? Explain each of them. Distinguish between PCM and DM. Why has the PCM sampling time been set at 125 sec? Mention two applications of BFSK. 4+3+2+1=10

2. Compare HDLC and PPP. Define flow control. Explain the operation of the sliding window protocol. A channel has a bit rate of 4 kbps and a propagation delay of 20 msec. For what range of frame sizes does stop-and-wait give an efficiency of at least 50 percent? 3+1+4+2=10

3. *(a)* How does NAT help to solve depletion of IP addresses? What are the controversies around using NAT? 4+2=6

(b) A company has a class C network address of 204.204.204.0. It wishes to have three subnets, one with 100 hosts and two with 50 hosts each. Find the subnet address, subnet mask, first and last host IP address and broadcast IP for each subnet. 4

4. *(a)* Draw the IPv6 header citing field name and length. Distinguish between the layer 2 and layer 3 switches. 2+2=4

(b) What is count-to-infinity problem? What are its possible solutions? 1+2=3

(c) Three sites *X*, *Y* and *Z* in Europe ask for 2048, 1024 and 4096 addresses, in that order, starting from 194.24.0.0. A packet arrives at a router with destination IP address = 194.24.17.4. Where should it be forwarded? 3

5. *(a)* Explain the slow start, congestion avoidance and multiplicative decrease phases of TCP congestion control. What are fast retransmit and fast recovery? 4+2=6 *(b)* 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? 2+2=4

6. *(a)* Give a brief description of DNS operation. Can a computer have two DNS names that fall in different top-level domains? If so, give a plausible example. If not, explain why not. 4+1+2=7

(b) List and briefly define the key elements of SNMP. 3

7. *(a)* What are different versions of HTTP? What is meant by saying that HTTP is a stateless protocol? What is the function of the cache in HTTP? How is HTTP related to WWW? 1+1+2+2=6

(b) Discuss various QoS issues of TCP. 4

8. *(a)* How does VLAN work? Explain with an example. 4

(b) What is Bluetooth? Draw and discuss the protocol architecture of Bluetooth. 1+5=6

★ ★ ★