**M.Tech Odd Semester (CBCS) Exam.,
December—2016**

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. Write two reasons for using layered protocols. List and briefly define the important factors that can be used in evaluating or comparing the various digital-to-digital encoding techniques. A binary signal is sent over a 3 kHz channel whose signal-to-noise ratio is 20 db. Calculate the maximum achievable data rate. Distinguish between synchronous and statistical TDM. 2+3+3+2=10

2. Data is transmitted over a half-duplex radio link at a rate of 28·8 kbps using a stop-and-wait ARQ strategy. Frames have a block length of 256 bytes of which 5 are non-information bytes. If the propagation delay is 1 ms and processing delays and acknowledgement transmission time can be neglected, determine _(a)_ the throughput in the absence of errors and _(b)_ the throughput in the presence of a bit error rate of 10^4. Discuss the CSMA/CD protocol. Distinguish between ethernet and token Ring. 3+4+3=10

3. Distinguish between distance vector and link state routing algorithms. Explain the distance vector routing algorithm with an example. What are its drawbacks? What are the solutions for that? 2+5+1+2=10

4. Distinguish between IPv4 and IPv6. Why is IP called 'best-effort delivery' protocol? Subnet the class C network address 198.67.25.0 into eight subnets. Find the subnet network IP, valid host IPs and broadcast IP for each subnet. What is gratuitous ARP? 3+2+4+1=10

5. Explain the two-way and three-way handshake mechanisms of TCP. What are the different QoS issues of TCP? Explain the token bucket mechanism. Consider the effect

of using slow start on a line with a 10 msec round-trip time and no congestion. The receive window is 24 KB and the maximum segment size is 2 KB. How long does it take before the first full window can be sent?

4+1+3+2=10

6. Why are transport layer protocols like TCP and UDP called end-to-end protocols? Mention at least two applications each for TCP and UDP. With a reliable sequencing network service, are segment sequence numbers strictly necessary? What, if any, capability is lost without them? Explain the TCP sliding window flow control with example. 2+2+2+4=10

7. Briefly explain the different components of SMTP. Distinguish between POP3 and IMAP. Excluding the connection establishment and termination, what is the minimum number of network round trips to send a small e-mail message using SMTP? What is WWW?

4+3+2+1=10

8. What is DNS resource record? Give a brief description of DNS operation. Explain the differences among HTTP proxy, gateway and tunnel. What is the function of the cache in HTTP? 2+4+2+2=10

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