Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/M.Tech (CSE)/SEM-2/MCSE-201/2011
2011
ADVANCED COMPUTER NETWORKS

Time Allotted : 3 Hours   Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words
as far as practicable.

GROUP – A

Answer *all* the following questions.

1. Prove that for a hexagonal geometry the co-channel re-use ratio is given by $Q = \sqrt{(3N)}$, where N is the number of cells in a cluster. Also prove that $N = i^2 + j^2 + ij$ 8 + 7

2. Compare and contrast between circuit switching and packet switching.   5

3. Differentiate between hard and soft handoff. Which one is used in GSM ?   4 + 1

4. If 8 speech channels are supported on a single ratio channel, and if no guard band is used, what is the number of maximum simultaneous users in GSM ?   5

30291 (M.Tech)   [Turn over

5. If a total of 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system, which uses to 25 kHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if the system uses 7-cell reuse. 5

GROUP – B

Answer any *seven* of the following.

6. How are DNS queries resolved ? Differentiate between zone and domain. 3 + 2

7. What is TCP silly window syndrome ? How does Clark's and Nagle's algorithm help in minimizing the syndrome ? 2 + 3

8. a) Consider a single video source transmitting 30 frames per second to a certain receiver. Each frame contains 2 Mb of data. The jitter in the network is known to be 1 sec. Compute the amount of buffer space required at the receiver to compensate for the jitter. 3

   b) What is the significance of the term 'out of band control' in FTP ? 2

9. Differentiate between working principles of link state and distance vector algorithms with one example from each of them. 5

10. a) Why are two separate addresses required to identify a single host machine ? 2

   b) What is CIDR ? Explain its utilities with an example. 3

11. Design a LAN for 200 computers in such a way so that the Internet connectivity of 1 Mbps gets equally divided among them and the url 'www.xyz.com' becomes non-accessible by all the nodes in the LAN. 5

12. Draw Unipolar RZ, NRZ-L, NRZ-I, RZ, AMI, Manchester and Differential Manchester coded waveforms for the same bit-stream of 110110100011. 5

13. a) Explain the process of acquiring an IP address by a newly arrived client machine in a DHCP-enabled environment. 3

   b) Differentiate between push and pull architectures of Internet with examples. 2

14. a) "UDP can also be used for reliable transmission over a network." Support or oppose the statement with proper justifications. 2

   b) "For unidirectional data transmission, symmetric and asymmetric key cryptographies provide same strength of encryption." Support or oppose the statement with proper justifications. 3

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