Exam No: _____

GANPAT UNIVERSITY

M. TECH SEM- I (Computer Engineering/Information Technology)

REGULAR EXAMINATION– DEC-2016

3CE105/3IT105- Wireless Networks

MAX. TIME: 3 HRS **MAX. MARKS: 60**

Instructions:(1) This Question paper has two sections. Attempt each section in separate answer book.
(2) Figures on right indicate marks.
(3) Be precise and to the point in answering the descriptive questions.

SECTION: I

Q.1 A Differentiate wired and wireless networks. **(03)**

Q.1 B Suppose in a cellular system total bandwidth available is 50 Mhz and need to allocate 100 Khz in each direction per channel for the voice communication. Calculate the number of channels allocated per cell if we use 4 & 7 cell reuse pattern. Write your conclusion on the number of channels/cell. **(03)**

Q.1 C Describe GSM architecture in detail. **(04)**

OR

Q.1 A Describe the GPRS architecture in brief. **(04)**

Q.1 B Suppose in a cellular system total bandwidth available is 33 Mhz and need to allocate 50 Khz in each direction per channel for the voice communication. Calculate the number of channels allocated per cell if we use 4 & 7 cell reuse pattern. Write your conclusion on the number of channels/cell. **(03)**

Q.1 C Explain the error protection mechanism used in GSM. **(03)**

Q.2 A Suppose two nodes A and B are connected via a link of bandwidth 4 Mbps and propagation time of 120 ms. The path in the reverse direction, from B- to- A has bandwidth of 2 Mbps and propagation time of 80 ms. Assume data packet size (including all headers) is 500 bytes and acknowledgment packets size is 100 bytes. Answer the following: **(05)**

a. Calculate the throughput A can achieve in transmitting to B using Stop-and-Wait. You can treat a 500-byte data packet as transferring 500 bytes of useful data.
b. Calculate the size of the window, in terms of number of data packets that A must use in order to transfer its data as fast as possible, if A instead uses Sliding Window.

Q.2 B Describe the concept of roaming in GSM with an example. Differentiate Hard-Handoff and Soft-Handoff. **(05)**

OR

Q.2 A A system uses the "stop – and – wait" ARQ protocol. If each packet carries 500 bits of data, how long does it take to send 1 million bits of data if the distance between the sender and receiver is 5000 km and the propagation speed is 2*10^8 m ? Ignore transmission, waiting, and processing delays. We assume no data or control frame is lost or damaged. **(03)**

Q.2 B Discuss the concept of priorities in 802.11. **(04)**

Q.2 C CSMA/CD can be used in wireless network or not, explain with reasons. **(03)**

Q.3 A Suppose there are 3 stations S1, S2 and S3 that wants to send the packets of size 500 bytes, 1400 bytes & 1000 bytes at time 0, 120 & 250 µs respectively. Assume slot time of 20µs, SIFS Time of 10µs, RTS threshold of 1100 bytes, fragmentation threshold of 2400 bytes and RTS, CTS & ACK of 100 bytes. Each station can transmit 200 bytes per slot time. When does data transfer complete for all stations? Write any assumptions if required. **(04)**

Q.3 B Describe hidden terminal & exposed terminal problems. Discuss the solutions to it. **(04)**

Q.3 C Differentiate cellular and adhoc networks. **(02)**

SECTION: II

Q.4 A Explain anyone reactive routing algorithm with an example. **(04)**

Q.4 B A system uses the "stop – and – wait" ARQ protocol. If each packet carries 1500 bytes of data, how long does it take to send 10 MB of data if the distance between the sender and receiver is 5000 km and the propagation speed is 2*10^8 m ? Ignore transmission, waiting, and processing delays. We assume no data or control frame is lost or damaged. **(03)**

Q.4 C Differentiate proactive, reactive and hybrid approaches of routing algorithms for MANETs **(03)**

OR

Q.4 A Describe a proactive routing algorithm with an example. **(04)**

Q.4 B Calculate the total time required to transfer a 1000 KB file in the following cases assuming an RTT of 100 ms, a packet size of 1 KB, and an initial 2xRTT of "handshaking" before data is sent: **(04)**

Case-A: The bandwidth is 1.5 Mbps, and data packets can be sent continuously

Case-B: The bandwidth is 1.5 Mbps, but after we finish sending each data packet we must wait for one RTT before sending the next.

Case-C: The bandwidth is "infinite", meaning that we take transmit time to be zero, and up to 20 packets can be sent per RTT.

Q.4 C What is the need of ad hoc networks? Discuss the applications of ad hoc networks. **(02)**

Q.5 A Describe the concept of Mobile IP **(05)**

Q.5 B Explain TCP handshaking mechanism using TCP header. **(05)**

OR

Q.5 A Explain slow start, congestion avoidance mechanism of TCP. **(04)**

Q.5 B Explain TCP header. How TCP implements flow control mechanism? **(04)**

Q.5 C At time t, a TCP connection has a congestion window of 6 KB. The maximum segment size used by the connection is 1 KB. What is the congestion window after it sends out 6 packets and receives acknowledgments for all of them? Suppose there is one acknowledgement per packet. **(02)**

a. If the connection is in slow-start?
b. If the connection is in congestion avoidance phase?

Q.6 A What is cumulative acknowledgement? Explain the concept of SACK. **(03)**

Q.6 B Describe the concept of partial acknowledgement in NewReno **(03)**

Q.6 C Explain expanding ring search mechanism of AODV. **(02)**

Q.6 D Discuss ZRP in brief. **(02)**

----------END OF PAPER----------