

GANPAT UNIVERSITY
M. TECH SEM- I (Computer Engineering/Information Technology)
REGULAR EXAMINATION NOV-DEC 2017
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 following: i) Wired and wireless networks ii) Connection oriented and connection less mechanism. (03)
- B.** Suppose in a cellular system total bandwidth available is 33 Mhz and need to allocate 25 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)
- C.** Explain GPRS architecture in detail. (04)

OR

- Q.1 A.** Describe the GSM architecture in brief. (04)
- B.** 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 meter/second? Ignore transmission, waiting, and processing delays. We assume no data or control frame is lost or damaged. (03)
- C.** Explain handoff mechanism 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-bytes 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.
- B.** Describe the concept of CDMA with an example. (05)

OR

- Q.2 A.** Explain the types of wireless networks and its characteristics. (03)
- B.** Discuss the concept of priorities in 802.11. (04)
- 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 μ s respectively. Assume slot time of 20 μ s, SIFS Time of 10 μ s, RTS threshold of 1200 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)
- B.** Describe hidden terminal & exposed terminal problems. Discuss the solutions to it. (04)
- C.** Describe the parameters to be considered for designing wireless networks. (02)

SECTION: II

- Q.4 A.** Describe DSDV with an example. (04)
B. Differentiate proactive and reactive and approaches of routing algorithms for MANETs (03)
C. Explain expanding ring search mechanism of AODV. (03)

OR

- Q.4 A.** Describe DSR with an example. (04)
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 $2 \times \text{RTT}$ 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.
C. Differentiate single-hop and multi-hop networks. (02)

- Q.5 A.** Describe the concept of Mobile IP (05)
B. Explain connection establishment mechanism using TCP header. (05)

OR

- Q.5 A.** Explain slow start, congestion avoidance mechanism of TCP. Is it possible to use standard TCP for wireless networks? Justify your answer. (06)
B. 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?
C. Describe the challenges for transport layer protocols for different kinds of networks. (02)
- Q.6 A.** What is cumulative acknowledgement? Explain the concept of SACK. (03)
B. Differentiate the design principle of TCP and UDP in context of network types. (03)
C. Describe AODV with an example. (04)

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