

Jadavpur University
B.E. Information Technology 3rd Year-1st Semester – 2025
Sub: Wireless and Mobile Networks

Full Marks: 100

Time: 3 hours

Answer all questions

CO1 (16)	Q.1 Answer any four: (4x4) - Comment on the services provided by 3G, 4G and 5G wireless systems? - What do you mean by hidden terminal and exposed terminal problem? - Explain in brief the working of reservation ALOHA scheme. - If a total of 33 MHz of bandwidth is allocated to a cellular telephone system which uses two 25 KHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if the system uses four cell reuse. - In a cellular network total number of available frequency is 140. Assume that the cells are hexagonal. What is the maximum number of frequency that can be used in a cell? As far as power requirement is concerned, what benefit we get by keeping the cell size small?
CO2 (20)	Q.2 Answer all: (6+7+7) - Define the following: frequency reuse, soft handoff, hard handoff. - With a suitable diagram show the main components of GSM networks and briefly explain their functions. - With a suitable diagram, explain how mobile terminated calls are handled in mobile telephone systems.
CO3 (15)	Q.3 Answer any five: (3x5) - Describe how collision is avoided using NAV signal in WLAN. - List the layers of OSI model to build WLAN. - Compare and contrast CSMA/CD with CSMA/CA. - Describe a method for clock synchronization in infrastructure WLAN. - List different IFS of IEEE 802.11 according to priority level and mention the type of traffic/service used in each IFS. - Power is a real crisis for wireless and mobile devices. Describe a suitable power management scheme for infrastructure WLAN.
CO4 (20)	Q.4 Answer all: (5+(3+3+2)+(2+5)) - What do you mean by neighbor notification and address auto-configuration in MIPv6? - What are the functions of home agent and foreign agents in mobile IP protocols? What do you mean by pre-handoff and post-handoff mechanisms in MIP? What is the difference between the care-of-address and co-located care-of-address? - What is triangular routing? How triangular routing problem is eliminated in MIPv6?
CO5 (15)	Q.5 Answer any five: (3x5) - Compare between DSDV, DSR and AODV routings. - Why do you think in a very dynamic environment the performance of DSR will be much better than AODV? - Explain how DSDV avoids count-to-infinity problem. - Why is routing in multi-hop ad-hoc networks complicated, what are the special challenges? - How does the symmetry of wireless links influence the design of routing algorithm for mobile ad-hoc networks? - What do you mean by promiscuous receive mode? Name few example areas where ad-hoc networks can be used?
CO6 (14)	Q.6 Answer any two: (7+7) - Explain the problems TCP faces in wireless networks. When a mobile device crosses cell boundary, a handoff takes place. How does this fact affect TCP performance? - Write short notes on: Explicit Notification Approach. - What is the reaction of standard TCP in case of packet loss? In what situation does this reaction make senses and why is it quite often problematic in case of wireless networks? Can the problems using TCP be solved by replacing TCP with UDP? Where could this be useful and why is it quite often dangerous for network stability?