

Jadavpur University
B.E. Information Technology 3rd Year-1st Semester – 2024
Sub: Wireless and Mobile Networks

Full Marks: 100

Time: 3 hours

Answer all questions

CO1 (16)	<p>Q.1 Answer any four: (4x4)</p> <ol style="list-style-type: none"> i) Describe the steps used in a handoff process of a cellular system. ii) Comment on the services provided by 3G, 4G and 5G wireless systems? iii) Describe the steps used in a handoff process of a cellular system. iv) What do you mean by hidden terminal and exposed terminal problem? v) What is the main physical reason for the failure of many MAC schemes known from wired networks? What is done in wired networks to avoid this effect? vi) 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.
CO2 (20)	<p>Q.2 Answer all: (6+(5+5)+4)</p> <ol style="list-style-type: none"> i) List three important entities in GSM architecture and explain their functions. ii) Develop a flow diagram for intra-BSC and intra-MSC handoff in a cellular network. iii) Suppose in a CDMA system SNR is 30 db, total available bandwidth is 200 MHz, number of users is 100. What amount of bandwidth each user can enjoy?
CO3 (15)	<p>Q.3 Answer (i) and any two from the rest (7+4x2)</p> <ol style="list-style-type: none"> i) With a suitable diagram describe how fairness problems regarding channel access solved in IEEE 802.11 ii) Describe how collision is avoided using NAV signal in WLAN. iii) Power is a real crisis for wireless and mobile devices. iv) Describe a suitable power management scheme and clock synchronization for infrastructure WLAN.
CO4 (20)	<p>Q.4 Answer all: (6+(3+3)+8)</p> <ol style="list-style-type: none"> i) When and how is a mobility binding created between the correspondent nodes and mobile nodes? How does mobility binding optimize the route? ii) What is the difference between the care-of-address and co-located care-of-address? What are the functions of home agent and foreign agents in mobile IP protocols? iii) In mobile IPv6, depending on whether or not the correspondent node has knowledge of the mobile's current care-of-address, its messages destined for the mobile in its current location are sent in different ways. <ol style="list-style-type: none"> a. Discuss how messages should be sent to the mobile in its current location. b. What are the advantages of mobile IPv6 compared with mobile IPv4?
CO5 (15)	<p>Q.5 Answer any five: (3x5)</p> <ol style="list-style-type: none"> i) Recall routing in fixed networks. Explain the consequences and problems of using IP together with the standard routing protocols for mobile communications. ii) Describe the following functionalities in DSR: Route discovery and Route maintenance. iii) What are the purposes of promiscuous receive mode in DSR? iv) Compare between DSDV, DSR and AODV routings. v) Why do you think in a very dynamic environment the performance of DSR will be much better than AODV? vi) Explain how DSDV avoids count-to-infinity problem
CO6 (14)	<p>Q.6 Answer any two:</p> <ol style="list-style-type: none"> a. (7+7) <ol style="list-style-type: none"> i) When a mobile device transmits TCP packets, most of the packets are lost due to high wireless loss rate. How does this fact affect TCP performance? Describe a mechanism to improve TCP performance when such loss occurs in the network. ii) Distinguish split connection and end-to-end implementation in TCP for a wireless environment. iii) Write short notes on: Localization approach to improve TCP performance in wireless environment.