



- Notes :
1. Due credit will be given to neatness and adequate dimensions.
 2. Assume suitable data wherever necessary.
 3. Diagrams should be given wherever necessary.
 4. Illustrate your answer necessary with the help of neat sketches.
 5. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. a) What are the means to mitigate narrowband interference? What is the complexity of the different solutions? 6
b) What limits the number of simultaneous users in a TDM/FDM system compared to a CDM system? What happens to the transmission quality of connections if the load gets higher in a cell, i.e. how does an additional user influence the other users in the cell? 7

OR

2. a) What are the main benefits of a spread spectrum system? How can spreading be achieved? How can DSSS systems benefit from multi-path propagation? 7
b) Explain following layers in detail. 6
 - i) Network layer.
 - ii) Transportation layer.
 - iii) Application layer.
 - iv) Presentation layer.
3. a) Who performs the MAC algorithm for SDMA? What could be possible roles of mobile stations, base stations and planning from the network provider? 6
b) What is the basic prerequisite for applying FDMA? How does this factor increase complexity compared to TDMA systems? 7

OR

4. a) Name the main elements of the GSM system architecture and describe their functions. 6
b) Name some key features of the GSM, DECT, TETRA and UMTS systems. Which features do the systems have in common? 7
5. a) What characteristics do the different orbits have? What are their pros and cons? 7
b) Explain high-bandwidth internet access using digital video broadcast. 7

OR

6. a) Why are GEO systems for telecommunications currently being replaced by fiber optics? 7
b) Explain the functionalities of digital audio broadcast sender components. 7

SECTION – B

7. a) How are fairness problems regarding channel access solved in IEEE 802.11, HiperLAN 2, and Bluetooth? How is the waiting time of a packet ready to transmit reflected? 7
- b) Now is roaming on layer 2 achieved, and how are changes in topology reflected? What are the differences between infrastructure based and ad-hoc networks regarding roaming? 7

OR

8. a) With a focus on security, what are the problems of WLANs? What level of security can WLANs provide, what is needed additionally and how far do the standards go? 7
- b) Compare IEEE 802.11 HiperLAN 2 and Bluetooth with regard to their ad-hoc capabilities. Where is the focus of these technologies? 7
9. a) Name the requirements for a mobile IP and justify them. Does mobile IP fulfill them all? 6
- b) Compare the different types of transmission errors that can occur in wireless and wired networks. What additional role does mobility play? 7

OR

10. a) List the entities of mobile IP and describe data transfer from a mobile node to a fixed node and vice versa. Why and where is encapsulation needed? 7
- b) 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? 6
11. a) Why is strong consistency of file systems problematic in a wireless and mobile environment? What are the alternatives? 6
- b) What advantages does a connectionless session service offer compared to a simple datagram service? 7

OR

12. a) What are major differences between WAP 2.0 and WAP 1.x? 6
- b) How does caching improve access time and reduce bandwidth requirements? What are locations for a cache 7

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