30.9.19

B.E (FT) END SEMESTER EXAMINATIONS – APRIL / MAY 2019

ELECTRONICS AND COMMUNICATION ENGINEERING

Semester - 8

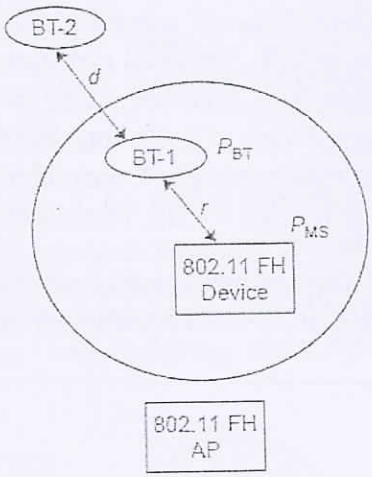
EC7021 WIRELESS COMMUNICATION NETWORKS

(Regulation 2015)

Time: 3 Hours | Answer ALL Questions | Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Compare Wi- Fi with HiperLAN in terms of frequency operation, Bandwidth and Data Rate.
2. Write down the significance of exponential back off algorithm employed in DCF MAC mechanism
3. What are orthogonal Variable Spreading Factor codes.
4. Calculate the uplink throughput for data service only for a WCDMA cell using the following information: Required Eb/Nt: 1 dB, Required interference margin: 3 dB, (cell loading 0.5), Interference factor due to other cells: 0.5 and Channel activity factor: 1.0.
5. Compare Hierarchical routing with flat routing.
6. Reason out why table driven routing is not suitable for mobile ad-hoc networks.
7. State the objectives and requirements of Interworking.
8. What is session mobility
9. Consider the Bluetooth and IEEE 802.11 FH interference scenario given below:



(a) Assuming that the acceptable error probability for the mobile terminal is 10^{-5}, find $(SIR)_{min}$ that supports this error rate, and (b) using $(SIR)_{min}$ from (a) calculate SNR_{max} for d = 10 m, SNR = 4, PBT= 20 dBm and PAP = 40 dBm

10. List out the applications of 4G.

Part – B (5 x 13 = 65 marks)

11. a) With appropriate sketches, discuss the architecture and Protocol stack along with layer functionalities of IEEE 802.11 WLAN. (6 + 7)

(OR)

b) i. Illustrate how the QoS of HiperLAN users can be enhanced by employing Elimination –yield non-preemptive priority multiple access scheme. (10)

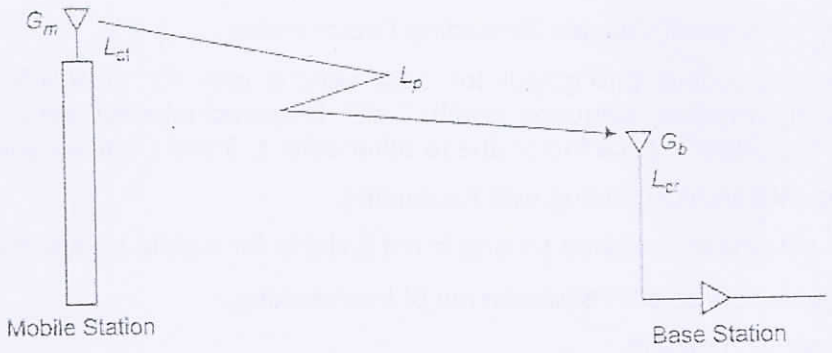
ii. Provide your understanding on extension of ATM to mobile ATM (3)

12. a) i. Explain the air interface protocol architecture of WCDMA (8)

ii. List out the types of channels used in WCDMA along with their functions. (5)

(OR)

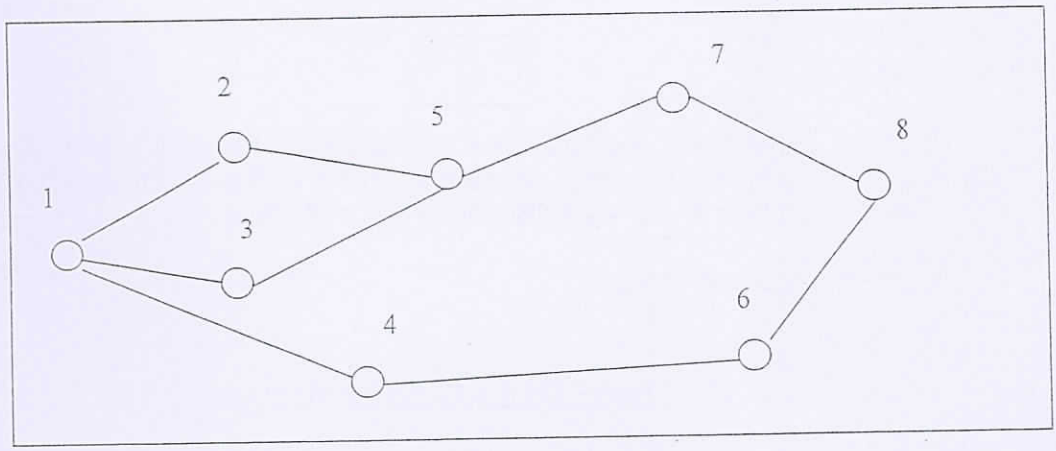
b) Determine the minimum signal power required for the acceptable quality of voice at the base station receiver of an IS-95 CDMA system. What is the maximum allowable path loss? Use the following data and refer Figure:



Uplink Transmission from MS to BS

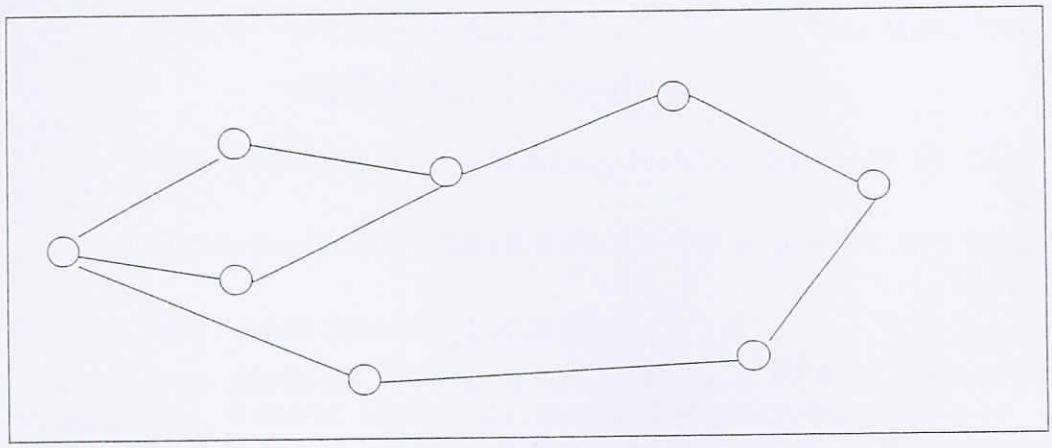
Noise density = 174 dBm/Hz, Channel bandwidth = 1.25 MHz, Chip rate = 1.2288 Mcps, Receiver noise figure = 6 dB, Effective radiated power of the mobile = 0.5 Watt (27 dBm), Transmitter cable and connector loss = 0.5 dB, Body loss = 1.5 dB, Receiver cable and connector loss = 2 dB, Interference margin = 0 dB, Fast fading margin = 2 dB, Penetration losses =8 dB, Transmitter antenna gain = 0 dBi, Receiver antenna gain = 12 dBi, Fade margin = 8 dB, Required Eb/Nt = 7 dB.

13. a) For the given MANET, explain the working mechanism of AODV and DSR. Also compare their performance in term of delay and throughput.



(OR)

b) For the given topology, apply LEACH and SPIN routing protocol and explain their working mechanism highlighting the salient features.



14. a) Explain operation and salient features of Local Multipoint Distribution Service used in Interworking

(OR)

b) Explain operation and salient features of Multichannel Multipoint Distribution System used in Interworking

15. a) Discuss the salient features, Physical Layer, Media Access Control of World Interoperability for MicroAccess, Inc. (WiMAX).

(OR)

b) The 4G technology support high data rate – justify your answer with the four major techniques incorporated in 4G

Part – C (1 x 15 = 15marks)

16. Deepak is travelling from Bombay to Chennai with his friend Kamal. Both are working as telecom engineering in Airtel. As a senior, Deepak is teaching Kamal the working mechanism involved in interworking between WLAN and GPRS through tight and loose coupling approaches. After narrating them, he is expecting Kamal to comment about their performance.