

# CBGS SCHEME

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17MT551

## Fifth Semester B.E. Degree Examination, Jan./Feb. 2021 Wireless Networks and Communication

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Explain with neat diagram wireless switching technology. (08 Marks)
- b. Discuss wireless communication problems encountered in wireless network. (08 Marks)
- c. A mobile receiver communicates at a distance of 5km with the transmitter which is having the operating frequency of 750MHz. Calculate the path loss in the system. (04 Marks)

OR

- 2 a. Explain various networking issues encountered in wireless network. (10 Marks)
- b. Explain how wireless network are classified based on range and application. (10 Marks)

### Module-2

- 3 a. With neat diagram, explain WBAN architecture and its characteristics. (10 Marks)
- b. Discuss Low Power Listening (LPL) protocols i) S-MAC and ii) T-MAC. (10 Marks)

OR

- 4 a. Explain with neat diagram, Bluetooth protocol stack. (08 Marks)
- b. Explain with neat diagram Zigbee stack architecture. (07 Marks)
- c. Discuss WPAN applications. (05 Marks)

### Module-3

- 5 a. Explain the following:
  - i) Error detection and correction codes
  - ii) Speech coding
  - iii) Block interleaving(10 Marks)
- b. Explain OFDM digital modulation technique. (10 Marks)

OR

- 6 a. Discuss diversity techniques in wireless communication. (08 Marks)
- b. Explain ultra wideband radio technology. (05 Marks)
- c. Write a note on smart antennas. (07 Marks)

### Module-4

- 7 a. With neat diagram, explain WLAN network architecture. (10 Marks)
- b. With neat diagram, explain WMAN network architecture. (10 Marks)

OR

- 8 a. Explain with neat diagram GPRS network architecture. (10 Marks)
- b. Explain features, architecture, functions and limitations of CDPD. (10 Marks)

### Module-5

- 9 a. Discuss classification of WSN routing protocols. (10 Marks)
- b. With neat diagram, explain WSN architecture. (10 Marks)

OR

- 10 a. With neat diagram, explain architecture and protocols in VANET. (10 Marks)
- b. Explain unique characteristics of VANET<sup>s</sup>. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.



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## Fifth Semester B.E. Degree Examination, Aug./Sept.2020 Wireless Networks and Communication

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. With a neat block diagram, explain wireless communication system. List out merits and demerits of wireless communication system. (08 Marks)  
b. Discuss the diversity techniques to combat fading in wireless communication. (07 Marks)  
c. Classify wireless networks based on signal range and area of application. (05 Marks)

OR

- 2 a. Explain wireless communication problems encountered in wireless networks. (08 Marks)  
b. Explain wireless switching technologies. (08 Marks)  
c. For a given communication system, transmitter operates at a frequency of 850 MHz with a power of 125mw. This transmitter communicates with the receiver having the received power of 1 $\mu$ w. What is the distance between the transmitter and receiver. (04 Marks)

### Module-2

- 3 a. With a neat diagram explain network architecture of WBAN and also discuss properties and applications of WBAN. (10 Marks)  
b. Explain sensor MAC and Timeout MAC protocols in WBAN. (10 Marks)

OR

- 4 a. Explain WPAN network architecture and topologies. (08 Marks)  
b. Explain protocol stack arrangement of Bluetooth technology. (08 Marks)  
c. A Bluetooth piconet master has 3 slaves S1, S2 and S3 having the packet types DM1, DM3 and DM5 respectively. All the slaves want to send the data to the master at different intervals of time. Draw the timing diagram for master slave communication. (04 Marks)

### Module-3

- 5 a. What is the received power in dBm for a signal in free space with a transmitting power of 1W, frequency of 1900MHz and distance from the receiver of 1000 meters if the transmitting antenna and receiving antennas both use dipole antennas with gain of approximately 1.6? What is the path loss in dB? Note 1W = + 30dBm. (04 Marks)  
b. Explain error detection and correction coding techniques in wireless telecommunication system. (08 Marks)  
c. Explain QPSK digital modulation technique. (08 Marks)

OR

- 6 a. Explain frequency hop spread spectrum modulation system (FHSS). (08 Marks)  
b. With a neat block diagram explain RAKE receiver used for CDMA systems. (08 Marks)  
c. Write a note on single antenna interference cancellation. (04 Marks)



Module-4

- 7 a. With a neat architecture diagram, explain network components and design requirements of WLAN. (10 Marks)
- b. Explain the following in WLAN physical layer protocol. (10 Marks)
- Layer description of IEEE802.11
  - FHSS PMD PHY sub layer
  - FHSS PLCP sub layer.

OR

- 8 a. Explain WMAN network components, features of WIMAX with neat diagram of WMAN architecture. (10 Marks)
- b. Explain with neat diagram GSM network architecture. (06 Marks)
- c. A cellular network has a total bandwidth of 56MHz. If two 35KHz simplex channels are used to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses :
- 4 – cell reuse
  - 7 – cell reuse
  - 12 – cell reuse.
- (04 Marks)

Module-5

- 9 a. Explain quantitative and qualitative features and advantages of Adhoc network. (10 Marks)
- b. Give classification of MANET routing protocol and explain reactive Adhoc on demand protocol. (10 Marks)
- OR
- 10 a. With neat diagram, explain wireless Mesh network architecture and give applications of it. (10 Marks)
- b. Explain unique characteristics of VANET and also explain applications of VANET. (10 Marks)

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## Fifth Semester B.E. Degree Examination, Jan./Feb. 2021 Wireless Networks and Communication

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. With a neat block diagram, explain the wireless communication system. (10 Marks)
- b. In a communication channel, the bandwidth is 10 MHz and SNR is 100:
  - (i) Determine the channel capacity.
  - (ii) If SNR drops to 10, how much bandwidth is needed to achieve the same channel as in (i). (10 Marks)

OR

- 2 a. Discuss the wireless communication problems encountered in wireless network. (10 Marks)
- b. Explain various networking issues encountered in wireless network. (10 Marks)

### Module-2

- 3 a. Explain the network architecture in the Wireless Body Area Network System (WBAN). (10 Marks)
- b. Explain the design issues in WBAN system and list the application of the Wireless Body Area Network (WBAN). (10 Marks)

OR

- 4 a. Explain the WPAN network architecture and topologies. (10 Marks)
- b. Explain protocol stack arrangement of Bluetooth technology. (10 Marks)

### Module-3

- 5 a. Explain QPSK digital modulation technique. (10 Marks)
- b. Explain error detection and correction coding techniques in wireless telecommunication system. (10 Marks)

OR

- 6 a. Explain RAKE receiver used for CDMA system. (10 Marks)
- b. Explain diversity techniques in wireless communication. (10 Marks)

### Module-4

- 7 a. Explain design requirements of WLAN. (10 Marks)
- b. Discuss the various WLAN standards. (10 Marks)

OR

- 8 a. Discuss the features of Wi-MAX. (10 Marks)
- b. With a neat diagram, explain GSM architecture. (10 Marks)

### Module-5

- 9 a. Explain quantitative and qualitative features of wireless Adhoc Networks. (10 Marks)
- b. Explain 5 routing protocols of Wireless Sensor Network (WSN). (10 Marks)

OR

- 10 a. Explain with neat diagram the wireless sensor network architecture. (10 Marks)
- b. With a neat diagram, explain the architecture and characteristics of VANET. (10 Marks)

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