

Total number of printed pages-4

53 (EC 713) WRSY

2021

(Held in 2022)

WIRELESS SYSTEMS

Paper : EC 713

Full Marks : 100

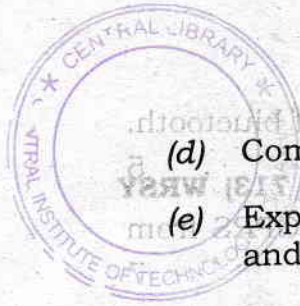
Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer **any five** questions.

1. (a) Differentiate between single-carrier and multicarrier systems. 2½
- (b) How are the carriers assigned to OFDM input signal ? What is RF upconversion for OFDM baseband signal ? 3
- (c) What is the role of IFFT stage in OFDM ? What is the need of the pilot carriers in OFDM ? 3

Contd.



- (d) Compare FDM and OFDM. 3½
- (e) Explain the salient features of IMT-2000 and applications. 8
2. (a) If a total of 52 subcarriers, spaced at 312.5 kHz are defined, find out the total occupied bandwidth excluding the secondary label. 3
- (b) How does the addition of guard interval reduce multipath effect and ISI ? 3
- (c) Explain the channel coding stages and channel estimation/correction at the OFDM receiver with the help of a diagram. 6
- (d) Explain the protocol stack of CDMA-2000. 8
3. (a) Write down the salient features of bluetooth technology. What are the various bluetooth connection modes ? 6
- (b) Describe the protocol stack of bluetooth. 6
- (c) What is the difference between RFCOMM and L2CAP bluetooth protocols ? 3

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- (d) Describe the frame format of bluetooth. 5
4. (a) Write salient differences of GPRS from GSM. Define EDGE. 7
- (b) Write the comparisons of the three wireless technologies — bluetooth, ZigBee and WiFi. 6
- (c) Describe the forward and reverse links of IS-95 system. 7
5. (a) Explain the TDMA system referring to its frame generation. What is TDMA capacity? Mention its advantages and disadvantages. $4+2+4=10$
- (b) What is multiple access for packet radio systems (random access)? Find the efficiency for pure ALOHA and slotted ALOHA system. $2+5=7$
- (c) What are the hybrid methods of multiple access? 3
6. (a) Explain how do pulse shaping and windowing techniques improve the spectral efficiency in OFDM. 6

- (b) Explain the concept of raised-cosine roll-off filter used for pulse shaping. 3
- (c) What is frequency-hopping spread spectrum ? Describe the transmitter and receiver units of FHSS. 11
7. (a) Describe the architecture of IEEE 802.11. Mention its various services. 7+3=10
- (b) What is WiMAX ? Explain its protocol architecture. 3+7=10

