



Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, January 2018
(2013 Scheme)
13.804 – WIRELESS COMMUNICATIONS (T)**

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions.

1. Give four aspects to show that 3G is superior to 2G.
2. Draw a block schematic of Zigbee transceiver.
3. What is frequency re-use in Cellular communication ?
4. What is Grade of Service in telephony ? Give Erlang-B formula.
5. Give wireless propagation methods for various RF bands.
6. What is narrow-band fading ? Suggest a method to mitigate its effect.
7. Define array gain of a diversity combining method with an example.
8. Show how DSSS suppresses narrow-band interference.
9. Compare EDGE and GPRS.
10. What is the near-far effect in CDMA ? **(10×2=20 Marks)**

PART – B

Answer **any one** question from **each** Module. **Each** question carries **20** marks.

Module – 1

11. a) Compare WLL and Cordless telephony system with necessary block schematics. **10**
- b) With block schematics, explain briefly any low-power wireless communication standard. **10**

OR



- 2. a) Write notes on modulation and multiple access techniques used in 2G and 3G communication system. 10
- b) Explain the structure of WLAN. 10

Module - 2

- 3. With neat diagrams, explain GSM system with details of every block. 20

OR

- 4. a) Explain the multiple access scheme used in GSM with a neat diagram of one symbol time-frame. 15
- b) Why is hand-off required in mobile communication system ? 5

Module - 3

- 5. a) Calculate the received power at a distance 900 m away from a transmitter that transmits at 5W and 900 MHz
 - i) with free- space model assuming Unit antenna parameters
 - ii) with Two-ray model with $h_t = 50$ m and $h_r = 1$ m as transmit and receive antenna dimensions, respectively. 10
- b) Give the matrix representation of received signal in a MIMO system, in AWGN channel. 5
- c) What is parallel decomposition of MIMO channels ? 5

OR

- 6. a) What is deep-fade ? Suggest a technique to mitigate deep-fade. 5
- b) Deduce array gain expression for Maximal-Ratio Combining. 10
- c) How does ISI emerge in multipath fading ? 5

Module - 4

- 7. a) With block schematics, explain a Direct-Sequence Spread Spectrum (DSSS) system. 10
- b) Explain why Cyclic Prefix (CP) and Virtual Carrier (VC) are used in OFDM. 10

OR

- 8. a) What is the significance of code selection in Spread Spectrum Multiple Access (SSMA) ? How does it affect the user capacity ? Show how Gold code is generated. 15
- b) Write note on GPS. 5
