Register No.: ……………………………… Name: …………………………………………………………..

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIRST SEMESTER M.TECH DEGREE EXAMINATION (Regular), FEBRUARY 2022
(Telecommunication Engineering)
(2021 Scheme)

Course Code :   **21TE104-D**

Course Name: **Trends in Modern Communication**

Max. Marks :   **60**   **Duration: 3 Hours**

PART A
(Answer all questions. Each question carries 3 marks)

1. Explain the principle of software defined radio.
2. Explain the basic principle of spectrum sharing in Cognitive Radio.
3. Justify the need of employing diversity techniques with wireless communication.
4. How PAPR affects OFDM system?
5. Explain the concept of Amplify and Forward scheme.
6. What is the concept of distributed space and time relaying systems?
7. Examine the design issues of a multi band antenna.
8. What are the three basic types of rechargeable batteries used in mobile phones?

PART B
(Answer one full question from each module, each question carries 6 marks)

MODULE I

9. How the SDR architecture is different from that of a traditional digital radio? Justify your answer with the help of block diagrams. (6)

OR

10. a) What demands a tunable DSM for a direct digital synthesizer? How is it different from the conventional one? (4)
    b) What are interpolation filters? Justify the need of it in SDR systems. (2)

MODULE II

11. a) Compare the schemes of primary transmitter detection methods for spectrum sensing. (3)
    b) What are the main functions involved in Dynamic Spectrum Access? Why DSA is important for cognitive radio? (3)

OR

12. Explain the mathematical model of Cognitive Radio employing matched filter detection. (6)

MODULE III

13. Analyse the BER performance improvement with Maximal ratio combining techniques in the case of space diversity scheme. (6)

OR

14. a) What are OSTBC? Comment on the length and rate of the code. (3)
    b) Explain the Almouti coding scheme. (3)

MODULE IV

15. a) Why OFDM is called an efficient modulation technique? Differentiate between FDM and OFDM. (4)
    b) List the advantages and challenges of OFDM. (2)

OR

16. With the help of a block diagram explain a simple OFDM system implementation using FFT transforms. (6)

MODULE V

17. a) Explain the concept of cooperative communications with schematics. (3)
    b) Explain the decode and forward relay scheme used in cooperative communication. (3)

OR

18. What is distributed space-frequency coding? What are the key features of the scheme? (6)

MODULE VI

19. a) List the design objectives of multi slot and multimode phones. (2)
    b) Justify the advantage of an up converting transmitter approach. Explain with block diagram. (4)

OR

20. Demonstrate the hardware of a GSM mobile phone using the internal hardware block diagram. (6)

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