Register No.: …… Name: ……..

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER M.TECH DEGREE EXAMINATION (Regular), JULY 2022

TELECOMMUNICATION ENGINEERING

(2021 Scheme)

Course Code: **21TE202**

Course Name: **Antenna Theory and Design**

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

PART A

(Answer all questions. Each question carries 3 marks)

1. Define radiation intensity and power gain.
2. Explain the working principle of monopole antenna.
3. Explain the concept of beam steering.
4. Contrast electromagnetic band gap with photonic band gap.
5. Illustrate planar designs for biomedical applications.
6. Explain the working of ground penetrating radar.
7. Compare MoM and FEM.
8. Explain Green's function with necessary equation.

PART B

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

MODULE I

9. Explain the method for measuring antenna impedance using anechoic chamber. (6)

OR

10. Explain in detail the directivity, impedance, radiation efficiency of an antenna. (6)

MODULE II

11. Design a microstrip patch antenna over a single substrate, whose center frequency is10 GHz. The dielectric constant of the substrate is 10.2 and the height of the substrate is 0.127 cm. (6)

OR

12. Analyze different feeding methods of a microstrip patch antenna. (6)

MODULE III

13. Derive the expression for electric field of a linear array having 'n' isotropic point sources of equal amplitude and spacing. (6)

OR

14. Explain in detail Schelkunoff method for antenna synthesis. (6)

MODULE IV

15. a) Paraphrase defective ground structure. (3)
    b) Explain frequency selective surface. (3)

OR

16. Illustrate and explain the antenna design considerations for an artificial impedance surface. (6)

MODULE V

17. Explain antenna design considerations for MIMO diversity systems with necessary diagrams. (6)

OR

18. Illustrate and explain antenna design for wireless personal communication. (6)

MODULE VI

19. Explain Method of Moments (MoM) with necessary equations. (6)

OR

20. Explain Finite Element Method (FEM) in detail. (6)

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