Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **18EC3005** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ANTENNAS AND RADIATION SYSTEMS** | **Max. Marks :** | **100** |

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| **Q. No.** | **Sub Div.** | **Questions** | **Course Outcome** | **Marks** |
| **ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)** | | | | |
| 1. | a. | With illustration, explain the types of single wire antenna and discuss about its radiation. | CO1 | 10 |
| b. | Give notes on;  i) Gain ii) Directivity  ii) Radiation intensity iv) Far –field region. | CO1 | 6 |
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| 2. | a. | Explain the working principle of Dipole (λ/2) with expressions for its parameters. | CO2 | 8 |
| b. | Discuss the types of polarization in detail. | CO2 | 8 |
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| 3. | a. | Derive the directivity of N-Element linear broadside array. | CO3 | 10 |
| b. | Give expressions for the parameters regarding end fire array with uniform spacing and amplitude. | CO3 | 6 |
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| 4. | a. | Give expressions and explain the beamwidths of rectangular aperture on an infinite ground plane. | CO4 | 10 |
| b. | What are the steps to be followed to solve an aperture problem? | CO4 | 6 |
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| 5. | a. | Explain various types of feeds in micro-strip antennas and also draw their equivalent circuits. | CO5 | 6 |
| b. | Illustrate the transmission line model of the rectangular patch antenna. Explain the design procedure for the same. | CO5 | 10 |
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| 6. | a. | Define Effective length, Resonant Frequency and Effective width with suitable mathematical expressions and illustrations. | CO5 | 8 |
| b. | Explain the Electric and Magnetic fields along with the resonant frequencies of a Circular patch in micro strip antenna. | CO5 | 8 |
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| 7. | a. | Give expressions for Quality Factor, Bandwidth and Efficiency of a microstrip patch antenna. | CO5 | 8 |
| b. | Design a rectangular microstrip antenna using a substrate (RT/Duroid 5880) with dielectric constant of 2.2, h= 0.1588 cm so as to resonate at 10 Ghz. | CO5 | 8 |
|  | | **COMPULSORY QUESTION (1 x 20 = 20 Marks)** |  |  |
| 8. | a. | Explain the Surface geometry of front-fed parabolic reflector antenna. | CO6 | 12 |
| b. | Give an insight of the phase errors in the parabolic reflector antenna. | CO6 | 8 |