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



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

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| **Code :** | **14EC2020** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ANTENNA THEORY AND WAVE PROPAGATION** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. |  | Prove that E21=E12, provided I1=I2 using reciprocity principle. | CO1 | 20 |
| **(OR)** | | | | |
| 2. |  | Explain the following terms:  i) Effective aperture ii) Scattering aperture  iii) Loss aperture iv) Collecting aperture  v) Aperture efficiency | CO1 | 20 |
|  |  |  |  |  |
| 3. | a. | Derive Eθ, Hϕ, and Pavg of half wave dipole antenna. | CO2 | 10 |
| b. | Prove that radiation resistance of half wave dipole antenna is 73Ω. | CO2 | 10 |
| **(OR)** | | | | |
| 4. | a. | Draw the thevenin’s equivalent of antenna system and explain. | CO2 | 5 |
| b. | Derive the expression of effective length and directivity of dipole antenna. | CO1 | 15 |
|  |  |  |  |  |
| 5. | a. | Differentiate between broad side array and end-fire array with a neat sketch. | CO2 | 5 |
| b. | Derive the resultant electric field of an array of two point source exited by equal amplitude and opposite phase. | CO2 | 15 |
| **(OR)** | | | | |
| 6. |  | Derive the equations of direction of pattern minima and maxima of end-fire array consisting of 4-isotropic sources equal amplitude and opposite-phase. | CO2 | 20 |
|  |  |  |  |  |
| 7. |  | Explain the construction, operation and design consideration of Rhombic antenna. | CO2 | 20 |
| **(OR)** | | | | |
| 8. |  | What is Yagi-uda antenna? Explain the construction and operation of yagi-uda antenna. Also explain its general characteristics. | CO2 | 20 |
|  | | **Compulsory**: |  |  |
| 9. |  | Explain the different regions and layers of structure of atmosphere with a neat sketch. | CO3 | 20 |