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



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

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| **Code :** | **17EC2014** | **Duration :** | **3hrs** |
| **Sub. Name :** | **TRANSMISSION LINES AND WAVE GUIDES** | **Max. Marks :** | **100** |

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

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | | **Marks** |
| 1. | a. | Extend the concept of impedance and derive the general equations of current and voltage in a transmission line. | CO1 | | 15 |
| b. | Summarize the physical significances of the transmission line from the general equations. | CO1 | | 5 |
| **(OR)** | | | | | |
| 2. | a. | Analyze the notion of continuous loading in transmission line and derive its line constants. | CO1 | | 10 |
| b. | With Campbell’s equation explain the concept of mitigating distortions in transmission lines. | CO1 | | 10 |
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| 3. | a. | Relate standing wave ratio with reflection coefficient. | CO2 | | 10 |
| b. | List the applications of quarter wave line and explain its significance by deriving its impedance equation. | CO2 | | 10 |
| **(OR)** | | | | | |
| 4. |  | A transmission line has a characteristic impedance of 300Ώ and terminated in a load of 150+j150 Ώ. Find the following using smith chart  i) VSWR ii) Reflection coefficient at load  iii) Input impedanceat 0.1λ from the load  iv) Input Admittance  v) Impedance of the transmission line at the maximum and  minimum of the standing waves on the line  vi) Position of first voltage minimum and maximum from the  load23 | | CO2 | 20 |
|  |  |  | |  |  |
| 5. | a. | Simplify the distributed element approach to design a constant-k high pass filter and infer on the variation of the secondary line constants with frequency. Examine the characteristic impedance of a high pass filter and sketch its variation characteristics with frequency. | | CO1 | 16 |
| b. | Apply the design equations to design a constant K-low pass filter if the design impedance is 500Ω and frequency equals to 2000Hz. | | CO3 | 4 |
| **(OR)** | | | | | |
| 6. |  | Design lattice type attenuators and equalizer circuits. | CO3 | | 20 |
|  |  |  |  | |  |
| 7. |  | Inspect on the parallel plate waveguide and derive the general solutions of waves between parallel planes of perfect conductors. | CO4 | | 20 |
| **(OR)** | | | | | |
| 8. |  | Examine the modes in a parallel plate waveguide and derive the attenuation of TE waves. | CO5 | | 20 |
|  | | **Compulsory**: |  | |  |
| 9. |  | Apply the circular waveguide concept and derive the Q factor of a cavity resonator for TE101 mode. | CO6 | | 20 |