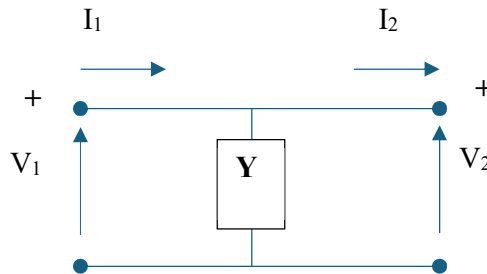


INSTRUCTIONS:

1. The question paper contain 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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|--|-----|-----|
| Q.1(a) For any two port Network with mismatched load, derive an expression to establish relationship between input reflection coefficient Γ_1 and load reflection coefficient Γ_2 . | [2] | 2 2 |
| Q.1(b) For any N-Port Network, derive an expression to present reflection coefficient S_{kk} at any k^{th} port in terms of input impedance $Z_{in k}$ and terminal impedance $Z_{0 k}$ respectively at K^{th} terminal. | [3] | 2 2 |

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| Q.2(a) Find ABCD parameters of the shunt admittance Y in the transmission line shown in Figure-1 | [2] | 2 3 |
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|---|-----|-----|
| Q.2(b) For any two-port network derive an expression to present reflection coefficient S_{11} in terms of ABCD parameters. | [3] | 2 2 |
| Q.3(a) Prove that it is impossible to construct a perfectly matched, lossless, reciprocal three port junction. | [2] | 2 2 |
| Q.3(b) Explain the working of E plane Tee. Derive the real values of scattering Matrix with proper choice of reference. | [3] | 3 2 |
| Q.4(a) A 20 mW signal is fed into one of the collinear ports 1 of a lossless H plane Tee junction. Calculate the power delivered through each port when other ports are terminated in matched load | [2] | 3 3 |
| Q.4(b) Compare E Plane Tee and H Plane Tee in terms of its construction and properties with the help of Scattering Matrix. | [3] | 3 2 |
| Q.5(a) A Magic Tee is terminated at collinear ports 1 and 2 and difference port 4 by impedance of reflection coefficients $\Gamma_1 = 0.5$, $\Gamma_2 = 0.6$ and $\Gamma_4 = 0.8$ respectively. If 1 W power is fed at the sum port 3, Calculate the power reflected at the port 3 and power transmitted to the other three ports. | [2] | 3 3 |
| Q.5(b) Discuss construction and working of waveguide directional coupler. Obtain Scattering matrix for the same. | [3] | 3 2 |