

Instructions to the Students:

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

(Level/CO) Marks

Q. 1 Solve Any Two of the following. 12

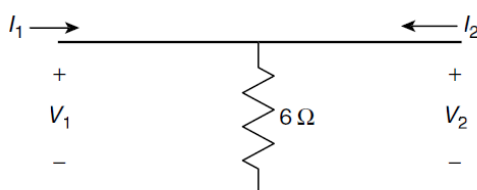
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| A) Derive the general solutions to Maxwell's equations for TE wave propagation in cylindrical transmission lines or waveguides. | CO1 | 6 |
| B) Derive the general solutions to Maxwell's equations for TM wave propagation in cylindrical transmission lines or waveguides. | CO1 | 6 |
| C) Consider a length of Teflon-filled, copper K-band rectangular waveguide having dimensions $a = 1.07$ cm and $b = 0.43$ cm. Find the cutoff frequencies of the first five propagating modes. If the operating frequency is 15 GHz, find the attenuation due to dielectric and conductor losses. Given Teflon, $\epsilon_r = 2.08$ and $\tan \delta = 0.0004$. | CO1 | 6 |

Q.2 Solve Any Two of the following. 12

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| A) Explain the operation of the Directional couplers with the help of a sketch. | CO2 | 6 |
| B) Explain the operation of Faraday rotation-based Gyrator with the help of a sketch. | CO4 | 6 |
| C) Explain the operation of Isolator with the help of a sketch. | CO2 | 6 |

Q. 3 Solve Any Two of the following. 12

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| A) Explain Z Parameters for two port network. | CO6 | 6 |
| B) Find the impedance parameters for the two-port network shown in the figure. | CO6 | 6 |



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| C) Explain the Transmission (ABCD) matrix. | CO6 | 6 |
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Q.4 Solve Any Two of the following.		12
A) Explain the Construction of Reflex Klystron with a sketch.	CO4	6
B) Explain the operation of 8-cavity Cylindrical Magnetron	CO4	6
C) Explain Impedance measurement.	CO7	6

Q. 5 Solve Any Two of the following.		12
A) Explain Principle of operation for PIN Diode.	CO2	6
B) Explain working of Varactor Diode.	CO2	6
C) Explain the following terms.	CO7	6
i. VSWR meter		
ii. Power Meter		

***** End *****