Code No: RR311701 | RR | SET-1

B. Tech III Year I Semester Examinations, December-2011
MICROWAVE ENGINEERING
(ELECTRONICS AND TELEMATICS ENGINEERING)

Time: 3 hours **Max. Marks: 80**

Answer any five questions
All questions carry equal marks

1.a) Write the expressions for the following and sketch their variation as a function of frequency in a rectangular waveguide.
i) Group and Phase Velocities
ii) Wave Impedances of TE and TM waves
b) Obtain the set of propagating modes in a rectangular waveguide of dimensions, 0.9inch x 0.4 inch at an operating frequency of 10.9 GHz. (1 inch = 2.54cm) [8+8]

2.a) Compute the resonant frequency of a rectangular cavity resonator with a x b x d given as 3cm x 1.5cm x 6cm. How much should be the length of the cavity with same cross sectional dimensions for the resonant frequency to be 9.36 GHz?
b) Give a brief account of the dielectric losses in a micro strip transmission line. [8+8]

3.a) Describe the functioning of a two-hole directional coupler with the help of neat schematics.
b) With suitable examples explain how an electromagnetic wave can be launched in to a waveguide through probe and loop coupling mechanisms. [8+8]

4.a) List the properties of S-parameters. Establish the scattering matrix of an E-plane Tee junction.
b) Explain how a circulator functions with the help of suitable diagrams. [10+6]

5.a) What is velocity modulation? While explaining the principle of oscillations in a reflex Klystron, derive an expression for conversion efficiency of a reflex klystron oscillator.
b) What is electronic admittance of a reflex klystron? Explain. [10+6]

6.a) Establish the Hull cut-off condition for anode voltage and magnetic field in a magnetron.
b) Discuss how a slow wave structure enables amplification of microwave signals in a TWT. [8+8]

7.a) What are transferred electron devices? List the conditions for RWH theory to be satisfied by a semi conductor material.
b) Discuss the conditions and possibility of oscillations in an IMPATT diode. [8+8]

8. With the help of suitable measurement set up explain how measurement of the following microwave quantities can be done.
a) Power b) VSWR [8+8]

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Code No: RR311701 | RR | SET-2

B. Tech III Year I Semester Examinations, December-2011
MICROWAVE ENGINEERING
(ELECTRONICS AND TELEMATICS ENGINEERING)

Time: 3 hours **Max. Marks: 80**

Answer any five questions
All questions carry equal marks

1.a) Compute the resonant frequency of a rectangular cavity resonator with a x b x d given as 3cm x 1.5cm x 6cm. How much should be the length of the cavity with same cross sectional dimensions for the resonant frequency to be 9.36 GHz?
b) Give a brief account of the dielectric losses in a micro strip transmission line. [8+8]

2.a) Describe the functioning of a two-hole directional coupler with the help of neat schematics.
b) With suitable examples explain how an electromagnetic wave can be launched in to a waveguide through probe and loop coupling mechanisms. [8+8]

3.a) List the properties of S-parameters. Establish the scattering matrix of an E-plane Tee junction.
b) Explain how a circulator functions with the help of suitable diagrams. [10+6]

4.a) What is velocity modulation? While explaining the principle of oscillations in a reflex Klystron, derive an expression for conversion efficiency of a reflex klystron oscillator.
b) What is electronic admittance of a reflex klystron? Explain. [10+6]

5.a) Establish the Hull cut-off condition for anode voltage and magnetic field in a magnetron.
b) Discuss how a slow wave structure enables amplification of microwave signals in a TWT. [8+8]

6.a) What are transferred electron devices? List the conditions for RWH theory to be satisfied by a semi conductor material.
b) Discuss the conditions and possibility of oscillations in an IMPATT diode. [8+8]

7. With the help of suitable measurement set up explain how measurement of the following microwave quantities can be done.
a) Power b) VSWR [8+8]

8.a) Write the expressions for the following and sketch their variation as a function of frequency in a rectangular waveguide.
i) Group and Phase Velocities
ii) Wave Impedances of TE and TM waves
b) Obtain the set of propagating modes in a rectangular waveguide of dimensions, 0.9inch x 0.4 inch at an operating frequency of 10.9 GHz. (1 inch = 2.54cm) [8+8]

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Code No: RR311701 | RR | SET-3

B. Tech III Year I Semester Examinations, December-2011
MICROWAVE ENGINEERING
(ELECTRONICS AND TELEMATICS ENGINEERING)

Time: 3 hours **Max. Marks: 80**

Answer any five questions
All questions carry equal marks

1.a) What is velocity modulation? While explaining the principle of oscillations in a reflex Klystron, derive an expression for conversion efficiency of a reflex klystron oscillator.
b) What is electronic admittance of a reflex klystron? Explain. [10+6]

2.a) Establish the Hull cut-off condition for anode voltage and magnetic field in a magnetron.
b) Discuss how a slow wave structure enables amplification of microwave signals in a TWT. [8+8]

3.a) What are transferred electron devices? List the conditions for RWH theory to be satisfied by a semi conductor material.
b) Discuss the conditions and possibility of oscillations in an IMPATT diode. [8+8]

4. With the help of suitable measurement set up explain how measurement of the following microwave quantities can be done.
a) Power b) VSWR [8+8]

5.a) Write the expressions for the following and sketch their variation as a function of frequency in a rectangular waveguide.
i) Group and Phase Velocities
ii) Wave Impedances of TE and TM waves
b) Obtain the set of propagating modes in a rectangular waveguide of dimensions, 0.9inch x 0.4 inch at an operating frequency of 10.9 GHz. (1 inch = 2.54cm) [8+8]

6.a) Compute the resonant frequency of a rectangular cavity resonator with a x b x d given as 3cm x 1.5cm x 6cm. How much should be the length of the cavity with same cross sectional dimensions for the resonant frequency to be 9.36 GHz?
b) Give a brief account of the dielectric losses in a micro strip transmission line. [8+8]

7.a) Describe the functioning of a two-hole directional coupler with the help of neat schematics.
b) With suitable examples explain how an electromagnetic wave can be launched in to a waveguide through probe and loop coupling mechanisms. [8+8]

8.a) List the properties of S-parameters. Establish the scattering matrix of an E-plane Tee junction.
b) Explain how a circulator functions with the help of suitable diagrams. [10+6]

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Code No: RR311701 | RR | SET-4

B. Tech III Year I Semester Examinations, December-2011
MICROWAVE ENGINEERING
(ELECTRONICS AND TELEMATICS ENGINEERING)

Time: 3 hours **Max. Marks: 80**

Answer any five questions
All questions carry equal marks

1.a) What are transferred electron devices? List the conditions for RWH theory to be satisfied by a semi conductor material.
b) Discuss the conditions and possibility of oscillations in an IMPATT diode. [8+8]

2. With the help of suitable measurement set up explain how measurement of the following microwave quantities can be done.
a) Power b) VSWR [8+8]

3.a) Write the expressions for the following and sketch their variation as a function of frequency in a rectangular waveguide.
i) Group and Phase Velocities
ii) Wave Impedances of TE and TM waves
b) Obtain the set of propagating modes in a rectangular waveguide of dimensions, 0.9inch x 0.4 inch at an operating frequency of 10.9 GHz. (1 inch = 2.54cm) [8+8]

4.a) Compute the resonant frequency of a rectangular cavity resonator with a x b x d given as 3cm x 1.5cm x 6cm. How much should be the length of the cavity with same cross sectional dimensions for the resonant frequency to be 9.36 GHz?
b) Give a brief account of the dielectric losses in a micro strip transmission line. [8+8]

5.a) Describe the functioning of a two-hole directional coupler with the help of neat schematics.
b) With suitable examples explain how an electromagnetic wave can be launched in to a waveguide through probe and loop coupling mechanisms. [8+8]

6.a) List the properties of S-parameters. Establish the scattering matrix of an E-plane Tee junction.
b) Explain how a circulator functions with the help of suitable diagrams. [10+6]

7.a) What is velocity modulation? While explaining the principle of oscillations in a reflex Klystron, derive an expression for conversion efficiency of a reflex klystron oscillator.
b) What is electronic admittance of a reflex klystron? Explain. [10+6]

8.a) Establish the Hull cut-off condition for anode voltage and magnetic field in a magnetron.
b) Discuss how a slow wave structure enables amplification of microwave signals in a TWT. [8+8]

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