Code No: NR311701 **NR**

III B.Tech I Semester Supplementary Examinations, November 2006
MICROWAVE ENGINEERING
(Electronics & Telematics)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Show that the theoretical efficiency of reflex klystron is 22.78%. [8+8]
   (b) How is tuning achieved in reflex klystron oscillators? Mention the tuning range of such a device.
2. (a) How is bunching achieved in a cavity magnetron. Explain the phase focusing effect.
   (b) Discuss types of magnetrons and list the important applications. [8+8]
3. (a) Explain how negative resistance devices produce oscillations and amplification?
   (b) Describe Gunn effect, and explain its significance. [8+8]
4. Describe a typical helium cooled ruby maser construction, operation, performance characteristics and applications. [16]
5. Describe the principles of operation and constructional details for the following type of attenuators:
   (a) Coaxial attenuator
   (b) Slab and Flap attenuators [8+8]
6. (a) Establish the properties of a series type waveguide Tee junction and find its S-matrix.
   (b) Explain the basic characteristics of ferrite materials [10+6]
7. (a) Derive the relationship between guide wavelength, cut-off wavelength and free space wavelength.
   (b) Give the experimental procedure to verify the above relationship. [8+8]
8. (a) Distinguish between Parallel stripline and Coplanar stripline.
   (b) Explain the advantages and the disadvantages of a Coplanar stripline over the Parallel stripline. [8+8]

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