

**III B.Tech I Semester Supplementary Examinations, May 2005**  
**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) Draw the applegate diagram of a Reflex Klystron and explain velocity modulation and bunching.  
(b) Describe the construction of a multicavity Klystron and the coupling techniques to be adopted for more interaction between RF electron beams.
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.
3. (a) Give the classification of solid state MW devices along with examples?  
(b) Why conventional tubes and solid state devices can not be used at microwave frequencies?
4. (a) What is meant by parametric up-converter? Explain its features.  
(b) Explain the principle of operation and characteristics of a parametric negative resistance amplifier?
5. (a) Derive a general expression for the resonant frequencies of a rectangular waveguide cavity.  
(b) List out the microwave applications cavity resonators.
6. With a neat sketch, describe the working of a magic Tee. What are its properties? Obtain its S-matrix and describe the applications for this microwave component.
7. (a) Give the relationship between unloaded Q and loaded Q of a cavity.  
(b) Explain how the above relationship can be proved using an appropriate test set-up
8. (a) Explain the concepts of propagation delay time for a stripline.  
(b) Is the Effective dielectric constant of a micro stripline a function of Relative dielectric constant? Justify.

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