

Code: 9A04606

B.Tech IV Year II Semester (R09) Supplementary Examinations July 2018

**MICROWAVE ENGINEERING**

(Electronics &amp; Communication Engineering)

(For 2009 (LC), 2010, 2011, 2012 regular &amp; 2011 (LC), 2012, 2013 lateral admitted batches only)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Draw the field patterns of  $TE_{11}$ ,  $TE_{21}$ ,  $TM_{11}$  and  $TM_{21}$  modes in rectangular waveguide.  
(b) Justify why  $TE_{10}$  is dominant mode in rectangular waveguide.
- 2 (a) State the factors up on which the attenuations constant of a parallel strip line are dependent.  
(b) Derive an expression for the attenuation factor of a micro strip line.
- 3 (a) Explain the construction and working of two choke type movable short circuit used in microwave circuits.  
(b) Write short note on tuning screws and ports.
- 4 (a) Write the properties of scattering matrix.  
(b) Obtain scattering matrix of E-plane Tee junction.
- 5 (a) What do you mean by O-type tubes? Explain difference between O-type and M-type tubes.  
(b) Derive the expression for the distance between cavities of klystron for maximum bunching.
- 6 (a) What is BWO? Explain its operation with a neat sketch.  
(b) Discuss about the performance characteristics and applications of BWO.
- 7 (a) Draw the schematic diagram of an n-type GaAs diode and explain its operation.  
(b) Derive the criterion for classifying the modes of operation for Gunn effect diodes.
- 8 (a) What is spectrum analyzer? List the types of spectrum analyzer. List some application of spectrum analyzer.  
(b) Describe a microwave bench.

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