



Printed Pages : 3

EC - 601

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 3038

Roll No.

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B. Tech.

(SEM. VI) EXAMINATION, 2006-07

MICROWAVE ENGINEERING*Time : 3 Hours]**[Total Marks : 100*

- Note :**
- (1) *Attempt all questions.*
 - (2) *All questions carry equal marks.*

1 Attempt any **four** of the following : **5×4=20**

- (a) Discuss cut off phenomena in rectangular wave guide.
- (b) What do you mean by modes? What does m and n indicate in TM_{mn} mode.
- (c) Show that TEM wave can not be propagated in a wave guide.
- (d) Guide wavelength in wave guide is always more than the free space wavelength. Justify the statement.
- (e) Compare the propagation characteristics of micro strip line and strip line.
- (f) Compare the propagation characteristics of rectangular wave guide with circular wave guide.

2 Attempt any **four** of the following : **5×4=20**

- (a) How cavity resonator is constructed? What do you mean by quality factor of a resonators.
- (b) Discuss various types of wave meters. Give their sketches and response.
- (c) What do you mean by coupling factor and directivity of a directional coupler. Define them using mathematical relation.
- (d) What is circulator? Discuss its theory of operation and suggest at least four applications in practice.
- (e) What do you mean by E-plane Tee and H-plane Tee. Compare their propagation characteristics.
- (f) What is attenuation? Name various types of attenuators. Discuss any one of them.

3 Explain any **two** of the following : **10×2=20**

- (a) Phase shifters
- (b) Wave guide discontinuities
- (c) Scattering matrix.

4 Attempt any **two** of the following : **10×2=20**

- (a) What are various methods for measuring frequency? Discuss them in details.
- (b) Discuss the method to measure the impedance of a load. Indicate the use of smith chart in this measurement.
- (c) Discuss various methods for measuring low microwave power. Comment on the accuracy of the measurement in the particular method.

5 Attempt any **two** of the following : **10×2=20**

- (a) Discuss the condition for sustained oscillation in reflex klystron. How frequency of oscillation is varied in this device.
 - (b) How amplification takes place in TWT? Discuss the beam wave interaction in this device. What is the use of slow wave structure in TWT ?
 - (c) How oscillation takes place in Gunn-diode? Discuss in details.
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