Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ETE)/(ECE) (2011 Onwards) (Sem.–6)

MICROWAVE & RADAR ENGINEERING

Subject Code : BTEC-601

Paper ID : [A2315]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

a. Name any two devices which make use of Faraday rotation.

b. Draw the diagram of impedance measurement using slotted line.

c. Give high frequency limitations of conventional tubes.

d. Explain the application of Magic Tee as duplexer.

e. What is back heating? How can it be avoided?

f. A TRAPATT has the following specifications :

Doping Concentration = $2.5*10^{16}/cm^3$

Current density = $33Ka/cm^3$

Calculate Avalanche zone velocity

g. Give the applications of Varactor Diode.

h. Draw the VI characteristics of Tunnel Diode.

i. Name any three techniques of Angle Tracking.

j. Write brief notes on :

a) Blind speed b) Monopulse Tracking

SECTION-B

2. How is bunching achieved in cavity magnetron? Explain the phase focusing effect.

3. Explain in detail with proper diagrams "Pulsed Radar System".

4. A marine RADAR operating at 10GHz has a maximum range of 50km with an antenna gain of 4000.If the transmitter has a power of 250Kw and minimum detectable signal of 10^{-11W}. Determine the cross section of the target RADAR can sight.

5. Give construction, characteristics and applications of a Gunn Diode.

6. Describe how can the power of a Microwave generator be measured using :

   Bolometer and Calorimeter techniques.

SECTION-C

7. Derive the expression for the efficiency of reflex Klystron. Also derive the relation between repeller and accelerating voltage.

8. What are the basic differences between search and tracking Radar? Discuss the various Scanning Techniques and tracking mechanisms in detail.

9. Obtain the scattering matrix for 3 port Circulator and also prove that it is impossible to construct a perfectly matched lossless, reciprocal 3 port junction.