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BIEL-016

B.Tech. – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

00474

June, 2017

BIEL-016 : MICROWAVE AND RADAR ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any* ***seven*** *questions. All questions carry equal marks. Missing data may be suitably assumed. Use of scientific calculator is permitted.*

1. Define mode of operation. What is a dominant mode ? Name the dominant modes in TE and TM waves and justify. Also derive the expressions for the field components of TE waves in Rectangular waveguide. *10*

2. (a) How is SWR measured using a slotted line technique ? *5*

(b) What are the problems with conventional vacuum tubes at microwave frequencies ? *5*

3. Explain with the help of a block diagram, the operation of a CW Radar and also discuss its limitations. *10*

4. Explain the working of a multihole directional coupler. If the power incidental from input port is 25 W, at output port is 15 W, at coupled port is 5 W and at backward port is 1 W, find the directivity and coupling coefficient of the coupler shown in Figure 1. *10*

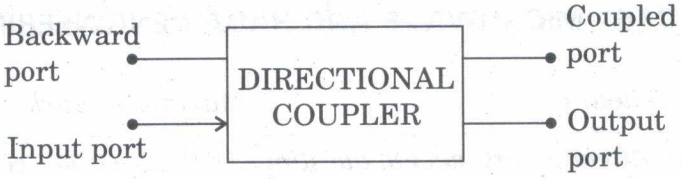

Figure 1

5. What is the role of Duplexer Radar Antennas and Front-End Amplifiers ? *10*

6. What is transferred electron effect and how is it utilized in the generation of a microwave signal in a Gunn diode ? Compare it with a tunnel diode. *10*

7. Give the applications of TWT, Magnetron and IMPATT diodes. *10*

8. (a) Give the significance of Rat-race function. *4*

   (b) Explain briefly, tracking of radar. *6*

9. Explain the principle of operation and performance characteristics of a two-cavity klystron. *10*

10. Write short notes on any ***two*** of the following : *2×5=10*

(a) LSA Diode

(b) Strip Line

(c) Circulators
