00578

No. of Printed Pages : 2

BIEL-016

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

Term-End Examination

December, 2015

BIEL-016 : MICROWAVE AND RADAR ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. Each question carries equal marks. Assume missing data, if any, suitably. Use of scientific calculator is allowed.*

1. (a) With necessary equations, explain radiation loss and dielectric loss in a microstrip line. *8*

(b) A certain microstrip line has the following parameters :

$\varepsilon_r = 5{\cdot}23$

h = 7 mils

t = 2·8 mils

w = 10 mils

Calculate the characteristic impedance Z_0 of the line. *2*

2. What is Scattering matrix ? Formulate the S matrix for a two-port junction. *10*

3. Draw a neat block diagram for impedance measurement. Explain the procedure in detail. *10*

4. (a) What are the various power losses in waveguide ? *5*

   (b) Explain Attenuator and its types. *5*

5. Explain the bunching process in a two-cavity klystron, with relevant diagrams. *10*

6. Explain the construction and principle of operation of an IMPATT diode with a neat diagram. *10*

7. Explain the π-mode of oscillations in an 8-cavity magnetron, with relevant diagrams. *10*

8. With the help of a schematic block diagram, explain the Radar transmitter and receiver system. Derive the expression for Radar range equation. *10*

9. Describe Doppler effect and how it is utilised in CW radars. With the support of mathematical equations, explain the operating principle and working of an FM CW radar. *10*

10. Explain the construction and the principles of different types of microwave antennas with neat sketches. *10*
