Roll No. .....

24326

B. Tech. 6th Semester (ECE) Examination – May, 2014

MICROWAVE AND RADAR ENGINEERING

Paper : EE-302-F

Time : Three Hours] [M.M. : 100

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complain in this regard, will be entertained after examination.

Note : Question No. 1 is ***compulsory***. Attempt any *five* question in all, selecting atleast one question from each Section. All questions carry equal marks.

1. (a) Discuss the characteristics of impedance of a wave guide. 5

   (b) What do you mean by hybrid ring ? Explain briefly. 5

   (c) Discuss the operation of Varactor Diode. 5

   (d) Discuss the Blind speed of a Radar. 5

SECTION-A

2. What are TEM, TE, TM and HE modes ? Sketch the field patterns for dominant mode in a rectangular waveguide. 20

3. Write short notes on : 20

   (i) Micro-strip arrays

   (ii) Dual frequency microstrip antenna

   (iii) Polarisation in microstrip antennas.

SECTION-B

4. Define a microwave junction. How can it be described by scattering matrix. Derive the scattering matrix relation between the Input and o/p of an n × n junction starting with an analogy of a transmission line junction. 20

5. Explain construction, operation and properties of Klystron amplifier. 20

SECTION-C

6. Explain the operation of Parametric amplifier. How is it different from a normal amplifier ? 20

7. Explain the operation, performance, characteristics, application and disadvantages of MASERS. 20

SECTION-D

8. Derive the radar range equation. Explain the factors that affect the maximum range of a radar. 20

9. How do you distinguish stationary targets and moving targets. Explain the principle and working of an MTI radar. An MTI radar operates at 8 GHz with a prb of 3500 pps. Calculate the lowest three Blind speeds of this radar. 20