B.E. (EXTC) (Sem -VII) (CBCGS)

Time : 3.00 Hours   Marks : 80

N.B.: 1. Q.1 is compulsory.
       2. Attempt any three from remaining.
       3. All questions carry equal marks.
       4. Assume suitable data, if required and state it clearly.

Q.1. Attempt any four out of five sub-questions (5 marks each).   [20]

(a) State five properties of S matrix

(b) Describe basic working principle of gyrotron tube

(c) What is hybrid ring? Explain its application in microwave engineering

(d) Discuss application of varactor diode in microwave engineering

(e) Explain microwave power measurement using bolometer method.

Q2. (a) Explain working of pi mode of magnetron with diagram.   [10]

(b) Design two lumped element L section matching network at 500MHz to transform
ZL =200-j100 Ω transmission line of 50Ω. Use Smith chart.   [10]

Q.3. (a) Differentiate between Monolithic ICs and Hybrid ICs   [10]

(b) What are ferrites? Explain Faraday rotation phenomenon in ferrites.   [10]

Q.4. (a) Derive the wave equation for a TM mode and obtain the solution of   [10]
transverse electric field component in a rectangular waveguide.

(b) Explain different modes of travelling wave tube amplifier.   [10]

Q.5. (a) Why are reentrant cavities used? Derive cut off frequency equation for a

circular cavity resonator.

(b) Explain construction and working of HEMT.   [10]

Q.6. (a) Consider the length of air-filled copper X-band waveguide, with   [5]
dimensions a=2.286cm, b=1.016cm operating at 10GHz. Find the
cutoff frequencies of dominating mode.

(b) Compare performance of circular and rectangular waveguides.   [5]

(c) Draw characteristics and explain working BARITT diode.   [5]

(d) What IS effective dielectric constant in microstrip line? Explain

procedure of single stub matching.   [5]

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