Exam No: _____

GANPAT UNIVERSITY

M.Tech.(EC) Sem-I CBCS (NEW) Regular, Nov-Dec 2015

(3EC 102) Elective (Advanced Microwave Engineering)

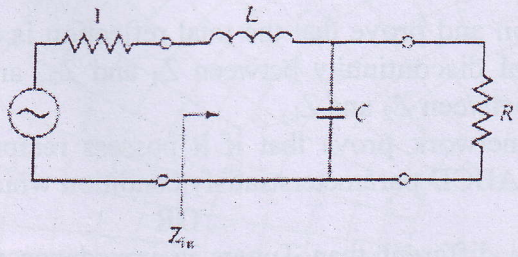
Max. Time: 3 Hrs.] [Max. Marks: **60**

Instructions:

1. Attempt **all** questions.
2. Answers to the **two** sections must be written in **separate** answer books.
3. Figures to the **right** indicate full marks.
4. **Assume** suitable data, if necessary.

SECTION –I

1 (A) As shown in following circuit For N=2, maximally flat low-pass filter prototype prove that L=C=√2. 5



(B) Derive equations for usage of insertion loss ratio method in microwave filter design and discuss it for maximally flat, equal ripple, elliptic and linear phase responses. 5

OR

1 (A) In detail discuss about Low-pass to high-pass filter transformation process. 5

(B) In microwave filter design procedure what is amplitude scaling and frequency scaling? Why it is required and how it will be obtained? 5

2 (A) Discuss about Wilkinson power divider in detail. 5

(B) Show that 3 port network which is lossless and nonreciprocal and terminated at all three ports simultaneously can be utilized as circulator device. 5

OR

2 (A) Discuss about functioning of resistive power divider circuit and with suitable equations prove that half of applied input power is dissipated at junction of the device. 5

(B) Write short note Directional couplers. 5

3 (A) Prove that it is impossible to design a 3 port microwave device which will be Lossless, Reciprocal and can be terminated at all three ports simultaneously. 5

(B) Discuss in detail about moving target indication (MTI) concept with reference to RADAR systems. 5

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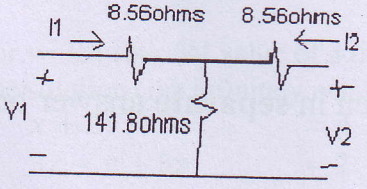
SECTION-II

4 A Find S parameter values for given following circuit and with obtained values of S parameters prove that it is 3-dB attenuator circuit. 5



B What is specialty of ABCD (Transmission) matrix? Explain its use with suitable example. 5

5 A Derive equation and prove that the total reflection is dominated by the reflection from the initial discontinuity between Z_1 and Z_2, and first reflection from the discontinuity between Z_2 and Z_L. 5

B For two port network prove that if it possess reciprocalness property then its analysis using ABCD parameters satisfy condition which is AD-BC=1. 5

OR

5 A How Stubs are different than Tuners in impedance matching process? Discuss various steps to have required impedance match using Double stubs. 5

B Derive required equations of reflection co efficient and fractional bandwidth for Quarter wavelength transformer. 5

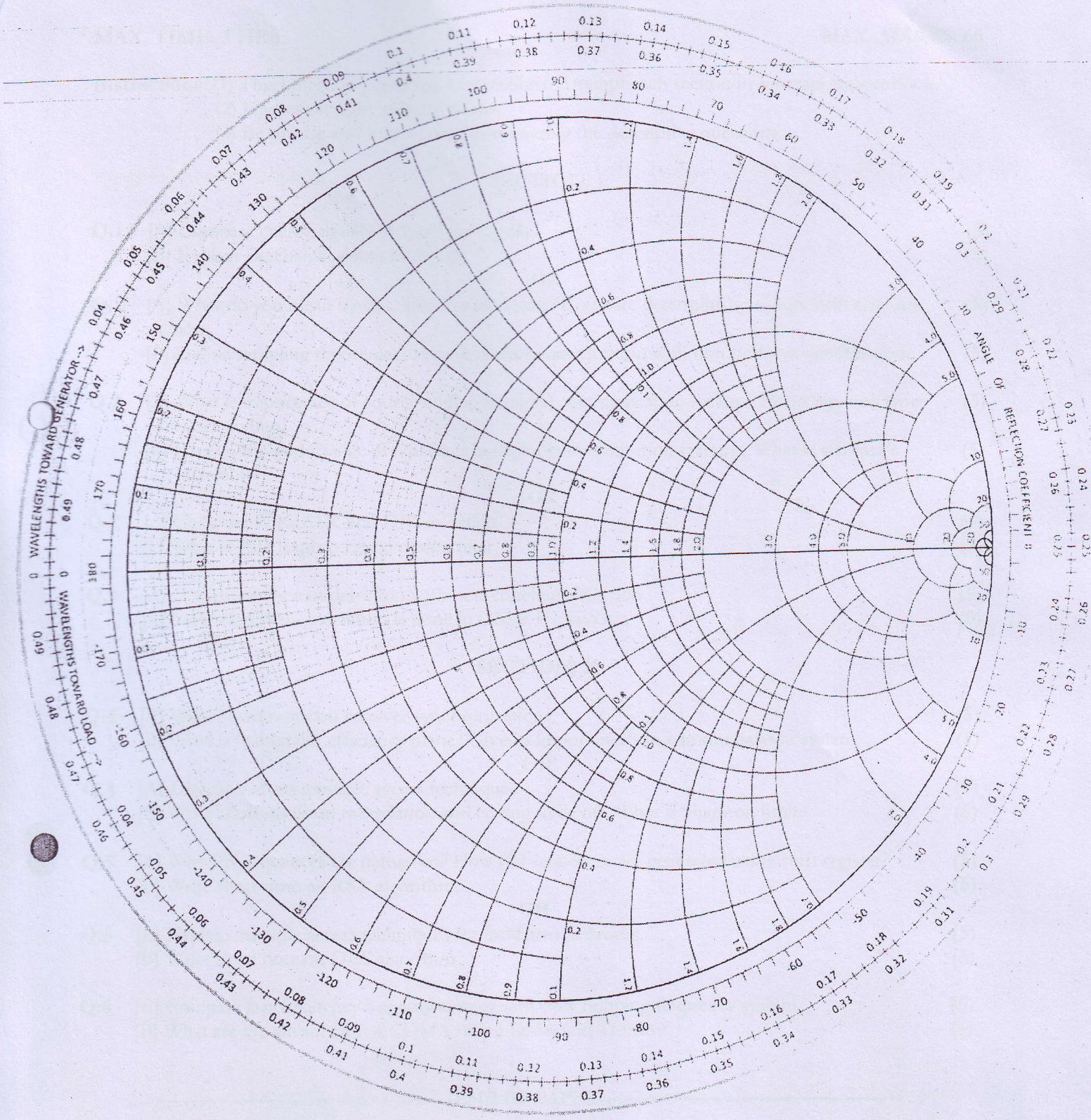
6 A A load impedance Z_L=100+j80 Ω is to be matched to a 50 Ω line using a single shunt stub. Find two possible solutions in terms of length and distance for required impedance matching. 5

B Discuss various selection criteria for Binomial multi-section transformers? Explain the design of Binomial multi section transformer for impedance matching purpose. 5

OR

6 A Define term RADAR and derive Radar Range Equation. 5

B A load impedance Z_L=100+j80 Ω is to be matched to a 50 Ω line using a single series stub. Find two possible solutions in terms of length and distance for required impedance matching. 5


WAVELENGTHS TOWARD GENERATOR -->
WAVELENGTHS TOWARD LOAD -->
ANGLE OF REFLECTION COEFFICIENT