

Seat No. **MAR_APR 2025 SUMMER EXAMINATION****1156 Master of Technology****Sub. Name: Advanced Microwave Circuit Design****Sub. Code: 72689****Day and Date: JUNE ,09-06-2025****Total Marks: 70****Time: 10:30 AM To 01:30 PM**

Instructions: 1. All questions are compulsory
 2. Assume suitable data wherever necessary and mention it boldly
 3. Figures to the right indicate full marks

Special Inst.: Use smith chart**Q1)** Solve following MCQ.**[14]**

- i. The specific element S_{ij} of the scattering matrix can be determined as:
- $S_{ij} = V_i / V_{j+}$
 - $S_{ij} = V_{i+} / V_j$
 - $S = V_{j+} / V_i$
 - None of the mentioned
- ii. For a one port network , the scattering parameter S_{11} in terms of impedance parameter Z_{11} is
- Z_{11}
 - $(Z_{11}+1) / (Z_{11}-1)$
 - $(Z_{11}+1) (Z_{11}-1)$
 - $(Z_{11}-1) / (Z_{11}+1)$
- iii. Scattering matrix for a reciprocal network is:
- Symmetric
 - Unitary
 - Skew symmetric
 - Identity matrix
- iv. The frequency response of an amplifier is _____
- Wide band
 - Narrow Band
 - Pass band
 - None of the mentioned
- v. If an amplifier has a noise temperature of 60K, what is its noise figure for an ambient temperature of 290K?
- 8dB
 - 80 dB
 - 0.82dB**

D. 0.88dB

- vi. An inductor is operating at frequency of 50 MHz. Its inductance is 0.1 μ H, and then the series resistance associated with the inductor is: ($Q_0=100$)
- 0.31 ohm
 - 1.32ohm
 - 1ohm
 - 1.561ohm
- vii. Important factors to be considered for power amplifier design are:
- Efficiency
 - Gain
 - Thermal effect
 - All of the mentioned

Q2) Solve any two [14]

- Explain the characteristics of the Smith chart [7]
- Explain Image parameter method for filter design [7]
- Explain coupled filters [7]

Q3) Solve any two [14]

- Define Multisession, band pass filters [7]
- The transmission line has characteristic impedance of 50 ohm and it is terminated in a load impedance of $(50+j50)$ ohm . The operating wavelength is 5cm, calculate SWR . Plot the normalized load impedance and SWR circle on the Smith chart [7]
- State and define S parameters and explain their meaning. [7]

Q4) Solve any two [14]

- Recognize Insertion loss method in MMIC. [7]
- Write short note on constant VSWR circles in case of microwave amplifiers [7]
- Explain High frequency Oscillator configuration [7]

Q5) Solve any two [14]

- Explain RF and Microwave amplifier design parameters. [7]
- Discuss in detail Basic characteristics of Mixers [7]

c. Distinguish the term Transducer of MMIC

[7]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1156) Master of Technology (CBCS) (72689) Advanced Microwave Circuit Design Part 1 SEM 2

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