K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

July-August 2025-26
B. Tech. Program: **Electronics and Telecommunication Engg.** Scheme: **III**
Carry On 23
Supplementary Examination: LY Semester **VII**
Course Code: **EXC701** and Course Name: **Microwave Engineering**
Date of Exam: 08.08.2025 Duration: 2.5 Hours Max. Marks: 60

Instructions:
(1). All questions are compulsory.
(2). Draw neat diagrams wherever applicable.
(3). Assume suitable data, if necessary.

Q. N.	Question	Max. Marks	CO	BT level
Q 1	**Solve any two questions out of three: (05 marks each)**	10		
a)	Construct the S-parameter of the 3 dB attenuator.		1	2
b)	Explain parametric amplifier.		3	2
c)	List the industrial application of Microwaves and explain any one in brief.		6	2
Q 2	**Solve any two questions out of three: (05 marks each)**	10		
a)	RWG has following characteristics b=1 cm, a=2.3 cm, $\mu r = 1$, $\varepsilon r = 25$. Solve: 1. Cut off frequency for TE_{10} and TM_{11} and Show the dominant mode.		2	3
b)	What is TWT? What do you mean by SWS? What are different types of SWS? Explain its construction and amplification process.		4	2
c)	List the methods of antenna gain measurement and explain anyone in detail.		5	2
Q.3	**Solve any two questions out of three. (10 marks each)**	20		
a)	Design two single stub (short circuited) tuning network for the terminating impedance $Z_L = 60\text{-}j80\ \Omega$ to match this load to a 50Ω line.		2	3
b)	Construct the S-matrix of 4-port two-hole Directional coupler.		3	3
c)	Explain the measurement of attenuation using microwave bench.		5	1
Q.4	**Solve any two questions out of three. (10 marks each)**	20		
a)	Derive and explain the equation of velocity modulation in klystron.		4	3
b)	Derive the wave equation for a TE wave and obtain all the field components in a Rectangular waveguide.		3	3
c)	Explain the different types of radar used.		5	2

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