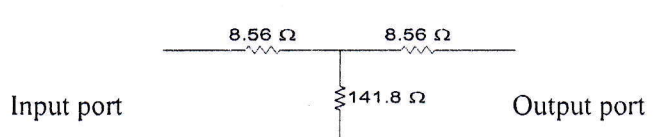


K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

November-December 2025-26		
(B. Tech) Program: Electronics and communication Engineering Scheme: III B		
Regular Examination: LY Semester: VII		
Course Code: EXC701 and Course Name: Microwave Engineering		
Date of Exam: 29 Nov. 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. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any two questions out of three: (05 marks each)	10		
a)	Explain microwave radar system. Classify the types of RADAR system.		CO6	U
b)	Construct s-matrix of the 3 port circulator.		CO2, CO3	Ap
c)	Explain the working of TRAPATT diode with neat diagram.		CO3	U
Q 2	Solve any two questions out of three: (05 marks each)	10		
a)	Draw and explain the functional diagram of magnetron oscillator. What is the phase focusing effect and mode jumping and how it is avoided in magnetron?		CO4	U
b)	Find the S-parameter of the 3 dB Coupler circuit as shown in figure 1.  Figure 1: Two port Network (3 dB Coupler)		CO1	Ap
c)	Explain the measurement of high VSWR by double minima method.		CO5	U
Q.3	Solve any two questions out of three. (10 marks each)	20		
a)	Construct a double stub tuner to match a load impedance of $Z_L = 60 - j80$ to a 50Ω transmission line. The stubs are open circuited and are spaced $\lambda/8$ apart. The match frequency is 2 GHz. (use smith chart)		CO2	Ap

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

November-December 2025-26
(B. Tech) Program: **Electronics and communication Engineering** Scheme: **III B**
Regular Examination: **LY Semester: VII**
Course Code: **EXC701** and Course Name: **Microwave Engineering**
Date of Exam: **29 Nov. 2025** Duration: 2.5 Hours Max. Marks: 60

b)	Explain the Gunn effect in details and describe the construction and operation of it. Discuss how it generates microwave frequencies.		CO3	U
c)	Explain microwave attenuation measurement using power ratio method.		CO5	U
Q.4	Solve any two questions out of three. (10 marks each)	20		
a)	i. Appraise the field equation for TE modes in rectangular waveguides. ii. Determine for the degenerate modes if operating frequency of 15 GHz, $a=1.07$ cm, $b=0.43$ cm and $\epsilon_r=2.08$.		CO2	E
b)	Appraise the equation of velocity modulation in klystron. Explain this concept w.r.t Apple gate diagram. What is the importance's of beam coupling coefficient?		CO4	E
c)	Explain the following in details: 1. RADAR range equation 2. Diathermy and hyperthermia medical application of microwaves		CO6	U
