



**BTECH**  
**(SEM VII) THEORY EXAMINATION 2023-24**  
**MICROWAVE & RADAR ENGINEERING**

**TIME: 3 HRS****M.MARKS: 100****Note:** 1. Attempt all Sections. If require any missing data; then choose suitably.**SECTION A****1. Attempt all questions in brief.**

Qno.	Question	Marks	CO
a.	What is the difference between micro strip and strip lines?	2	1
b.	What is the dominant mode of a circular waveguide?	2	1
c.	What are the different types of waveguide junctions?	2	2
d.	What are phase shifters in radar?	2	2
e.	What are microwaves tubes?	2	3
f.	What is the function of TWT?	2	3
g.	Define noise factor	2	4
h.	How do you calculate insertion loss?	2	4
i.	What is the function of pulse radar?	2	5
j.	Give RADAR Range equation.	2	5

**SECTION B****2. Attempt any three of the following:**

a.	Derive the expression for line impedance of a transmission line.	10	1
b.	Explain the construction and working of directional coupler. Derive expression for coupling factor and directivity.	10	2
c.	Discuss the principle of Operation of Backward Wave Oscillators.	10	3
d.	Write short notes on (i) Power Meters (ii) Microwave Amplifiers	10	4
e.	Explain RADAR with the help of block diagram.	10	5

**SECTION C****3. Attempt any one part of the following:**

a.	How standing wave can be formed? Also define standing wave ratio.	10	1
b.	Explain characteristic impedance of microstrip line. Also give the types of microstrip line	10	1

**4. Attempt any one part of the following:**

a.	What do you mean by microwave passive devices? Describe E-plane tee, H-plane tee and Magic tee.	10	2
b.	State the properties of s-parameters. Prove the unitary property of S parameter.	10	2

**5. Attempt any one part of the following:**

a.	What are the limitations of conventional active devices at microwave frequency? Explain	10	3
b.	Describe the operation of Reflex klystron. Also explain its characteristics and applications.	10	3

**6. Attempt any one part of the following:**

a.	What do you mean by insertion loss and attenuation? Discuss any one method for measurement of attenuation using microwave test bench	10	4
b.	Discuss the salient features of microwave measurements. Describe a voltage standing wave ratio (VSWR) meter.	10	4

**7. Attempt any one part of the following:**

a.	Explain MTI RADAR. What is the probability of false alarm in sonar?	10	5
b.	Discuss CW RADAR with its applications.	10	5