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## GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, June – 2021

(Sixth Semester)

**BECPC6020 – MICROWAVE THEORY AND TECHNIQUES**

(Electronics and Communication Engineering)

Time: 2 hrs

Maximum: 50 Marks

**Answer ALL Questions****The figures in the right hand margin indicate marks.****PART – A: (Multiple Choice Questions)****(1 x 10 = 10 Marks)**

- Q.1. Answer ALL questions** [CO#] [PO#]
- a. On which of the following principle does Klystron operates [CO 2] [PO 1]  
 (i) Frequency Modulation (ii) Amplitude Modulation  
 (iii) Velocity Modulation (iv) Pulse Modulation
- b. A space between two cavities in two cavity klystron is \_\_\_\_\_ [CO 2] [PO 1]  
 (i) Normal space (ii) Running space  
 (iii) Free space (iv) Drift space
- c. Magnetron is an \_\_\_\_\_ [CO 2] [PO 1]  
 (i) Oscillator (ii) Amplifier  
 (iii) Phase shifter (iv) Both phase shifter & amplifier
- d. Which one of the following device behaviour is governed by bulk effect? [CO 1] [PO 1]  
 (i) PIN diode (ii) Tunnel diode  
 (iii) Gunn diode (iv) IMPATT diode
- e. The material out of which PIN diode is made is: [CO 1] [PO 5]  
 (i) Germanium (ii) Silicon  
 (iii) GaAs (iv) None of the above
- f. Scattering matrix for a reciprocal network is: [CO 4] [PO 3]  
 (i) Identity matrix (ii) Skew symmetric  
 (iii) Unitary (iv) Symmetric
- g. Example of a non reciprocal device: [CO 3] [PO 1]  
 (i) Circulator (ii) Magic-T hybrid  
 (iii) Branch line coupler (iv) Wilkinson coupler
- h. The resonant frequency of a cavity resonator depends upon \_\_\_\_\_ [CO 2] [PO 5]  
 (i) The capacitor which tunes it (ii) Its physical dimensions  
 (iii) Its electrical dimensions (iv) The mode of operation
- i. The remedy for the problem of “blind speed “ is [CO 2] [PO 1]  
 (i) Change in Doppler frequency (ii) Use of MTI  
 (iii) Use of monopulse (iv) Variation of PRF
- j. In MTI radar, COHO operates [CO 2] [PO 1]  
 (i) Station frequency (ii) Pulse repetition frequency  
 (iii) At intermediate frequency (iv) At supply frequency

**PART – B: (Short Answer Questions)****(2 x 5 = 10 Marks)**Q.2. Answer ALL questions

	[CO#]	[PO#]
a. Compare O type and M type Tubes?	CO 2	PO 1
b. Define Gunn Effect?	CO 1	PO 1
c. What are the different Avalanche Transit Time Devices?	CO 1	PO 2
d. Find the resonant frequency of an air-filled rectangular cavity resonator with dimensions a = 5 cm, b = 3 cm and d = 4 cm?	CO 3	PO 2
e. List out some important applications of a radar system?	CO 4	PO 1

**PART – C: (Long Answer Questions)****(6 x 5 = 30 Marks)**Answer ANY FIVE questions

	Marks	[CO#]	[PO#]
3. State the limitations of conventional tubes at microwave frequencies?	(6)	CO 2	PO2
4. What is BWO? Explain its operation with a neat sketch?	(6)	CO 2	PO 2
5. Discuss the principle of operation of Microwave Field Effect Transistors?	(6)	CO 1	PO 1
6. Discuss the principle of operation of TRAPATT diode?	(6)	CO 1	PO 1
7. Describe the working of H-plane Tee and state why it is called shunt Tee?	(6)	CO 3	PO 1
8. Write short notes on: (i) Bends and Corners (ii) Attenuators (iii) Phase shifters.	(6)	CO 3	PO 2
9. Explain the basic principle of Radar with neat block diagram?	(6)	CO 2	PO 2
10. Explain with block diagram an FM-CW Radar using sideband super heterodyne Receiver	(6)	CO 2	PO 1

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