B.E.(with Credits)-Regular-Semester 2012-Electronics / Electronics & Telecommunication / Communication Engineering Sem. VII ET-EN : UHF & Microwaves

P. P Tim	ages : ne : Th	2 aree Hours $* 4 7 3 2 *$	GUG/W/16/6582 Max. Marks : 80
	Not	 es: 1. All questions carry marks as indicated. 2. Due credit will be given to neatness and adequate dimensions. 3. Assume suitable data wherever necessary. 4. Illustrate your answers wherever necessary with the help of neat sk 5. Use of Bessel function chart is permitted. 	etches.
1.	a)	Write the reasons for failure of conventional tubes at microwave frequencies	s. 8
	b)	Prove that efficiency of two cavity klystron is 58.2%.	8
		OR	
2.	a)	Explain the applegate diagram of Reflex klystron.	8
	b)	 A reflex klystron operates at n = 2 Beam voltage V₀ = 400V, Beam current signal voltage V₁ = 30 V. Determine : i) The input power in watts. ii) The output power in watts. iii) The efficiency. 	$I_0 = 25 \mathrm{mA}$, 8
3.	a)	Describe the structure of an O – type travelling wave tube and its characteris Explain how it works.	stics. 8
	b)	Explain in detail the strappings used in magnetron.	8
		OR	
4.	a)	Explain the operation of backward wave oscillator.	8
	b)	TWT operates under the following parameters Beam voltage $V_0 = 3kV$, Be $I_0 = 30 \text{ mA}$, characteristic impedance of helix $Z_0 = 10\Omega$ circuit length N = f = 10 GHz. Determine : i) Gain parameter ii) Output power gain Ap in decibels. iii) All four propagation constant.	am current 8 50 frequency
5.	a)	State and prove Carlin's theorem.	8
	b)	Derive S – matrix of Magic Tee.	8
		OR	

6. a) The scattering matrix of two port network is given by,

$$\mathbf{S} = \begin{bmatrix} \mathbf{0} & \mathbf{0.3} + \mathbf{j4} \\ \mathbf{0.3} + \mathbf{j4} & \mathbf{0} \end{bmatrix}$$

Find the distance that position of port 1 should be shifted to left. So that S_{12} and S_{21} will be real number. Given that $\beta = 3.43 \text{ rad}/\text{m}$.

	b)	Draw circulator using two magic tees and gyrator and explain its working.	8
7.	a)	Explain with neat sketch the operation of gyrator.	8
	b)	Draw a neat diagram and explain the operation of linear phase shifter.	8
		OR	
8.	a)	Draw constructional details of microwave attenuator. How microwave is attenuated.	8
	b)	Explain the working of two hole directional coupler & derive its coupling & directivity.	8
9.	a)	Explain the principle of operation of PIN diode with neat diagram.	8
	b)	Explain parametric amplifier with neat diagram.	8
		OR	
10.	a)	Define Gunn effect. With the help of two valley model theory explain how Gunn diode exhibits negative resistance.	8

b) What are Microstrip lines? Explain the different types of it?

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