

Reg.No. _____



Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – Nov/Dec – 2016

Code : 14EC2022
Sub. Name : Microwave and Optical Communication

Semester : 2016-17 ODD
Duration : 3hrs
Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	Describe the operation of Magic Tee and derive its scattering matrix.	CO1	15
	b.	Write short notes on waveguide corner.	CO1	5
(OR)				
2.	a.	Explain the operation of circulator by using two directional couplers and two phase shifters.	CO1	15
	b.	With neat diagram, explain the operation of Faraday rotation isolator.	CO1	5
3.	a.	Explain the operation of reflex klystron with functional diagram and applegate diagram.	CO3	15
	b.	Compare two cavity klystron and travelling wave tube amplifier.	CO3	5
(OR)				
4.	a.	With neat circuit diagram, elucidate the M type microwave vacuum tube which is used in microwave oven.	CO3	20
5.	a.	Describe the operating principle of IMPATT diode with neat physical structure diagram and waveforms.	CO3	20
(OR)				
6.	a.	Elucidate the operating principle of TRAPATT diode with neat physical structure diagram and waveforms.	CO3	20
7.	a.	What is numerical aperture? Derive the expression for numerical aperture with a neat diagram.	CO2	15
	b.	A light wave is travelling in a semiconductor medium (GaAs) of refractive index 3.6. It is incident on a different medium (AlGaAs) of refractive index 3.4 and the angle of incidence is 80°. Will this result in total internal reflection?	CO2	5
(OR)				
8.	a.	What is attenuation in an optical fiber? Explain the different types of attenuation.	CO2	15
	b.	Write short notes on dispersion.	CO2	5
<u>Compulsory:</u>				
9.	a.	What is the relationship between bandgap energy of a semiconductor laser and the wavelength of light emitted by it?	CO3	3
	b.	Calculate the band gap energy for a GaAs semiconductor laser if the wavelength of laser emitted by it is 0.4141 μm .	CO3	3
	c.	What are homojunction and heterojunction semiconductor lasers?	CO3	4
	d.	Explain the principle, construction and working of a semiconductor laser with necessary energy level diagram.	CO3	10

ALL THE BEST