Ref. No.: Ex/PG/PT/T/116A/2024

M.TECH PRINTING ENGINEERING AND GRAPHIC COMMUNICATION FIRST YEAR FIRST SEMESTER 2024

RADIOMETRY

Time: Three hours Full Marks: 100

Answer Any **Four** questions

1.	a. Explain the following quantities with mathematical expressions	10
	i. Radiant flux and luminous flux	
	ii. Radiant intensity and luminous intensity	
	iii. Irradiance and illuminance	
	iv. Radiance and luminance	
	v. Radiance temperature and color temperature.	
	b. What are the men made sources of UV rays? Explain.	10
	c. Write about the health issues of UV rays.	5
2.	a) Explain spontaneous emission, stimulated emission and stimulated absorption.	5
	b) Write on the three parts of laser construction.	15
	c) What are classes of laser?	5
3.	a) What are the types of noises in optical detectors? Explain	20
	b) Write the factors on which the strength of UV rays reaching the ground depends.	5
4.	Write short notes on	
	a) Incandescent light sources.	7
	b) Fluorescent light sources	6
	c) High-Intensity Discharge lamps.	6
	d) Light emitting diode.	6
5.	Write on the characteristics of optical detectors	25

6. a) A point source emitting uniformly in all directions is placed above a table-top at a distance of 0.50 m from it. The luminous flux of the source is 1570 lumen. Find the illuminance at a small surface area of the table-top (a) directly below the source and (b) at a distance of 0.80 m from the source. 10

b) The overall luminous efficiency of a 100 W electric lamp is 25 lumen/ W. Assume that light is emitted by the lamp only in the forward half, and is uniformly distributed in all directions in this half. Calculate the luminous flux falling on a plane object of area 1 cm^2 placed at a distance of 50 cm from the lamp and perpendicular to the line joining the lamp and the object. 10

c) Classify UV radiation. 5