MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent Institution of MAHE, Manipal)

VII SEMESTER B.TECH / I SEMESTER M.TECH
MAKE UP EXAMINATIONS, MAY 2018

SUBJECT: LIGHTING SCIENCE: DEVICES & SYSTEMS [ELE 5104]
REVISED CREDIT SYSTEM

Time: 3 Hours	Date: 08 MAY 2018	Max. Marks: 50

Instructions to Candidates:
- ❖ Answer **ALL** the questions.
- ❖ Missing data may be suitably assumed.

1A.	With a neat sketch, explain the functions of different parts of human eye.	*(05)*
1B.	Explain the Planckian locus of the black body radiator. Explain how the colour temperature of sources are be determined using Planckian locus.	*(05)*
2A.	Explain the point-by-point method to determine the horizontal illuminance on a surface due to a point source.	*(05)*
2B.	List out the differences between photometric and radiometric quantities.	*(02)*
2C.	A corridor of height 5.5 m from the floor is lighted by 4 lamps each of 200 Cd spaced 10 m apart. They are suspended at the centre line of the corridor and the drop of the lamps from the ceiling is 0.5 m. Find the illuminance at a point on the floor midway between second and third lamp	*(03)*
3A.	With a neat sketch, explain the different regions in the glow discharge.	*(03)*
3B.	With a neat diagram, explain the construction and working principle of Fluorescent lamp.	*(05)*
3C.	Explain the advantages of LED lights over other types of lamps.	*(02)*
4A.	What is a light control element? What are its desired functions? Give examples.	*(03)*
4B.	Explain the different types of refractors used as light controllers.	*(04)*

4C. The photometric test data of a luminaire having a lamp of nominal flux 6220 lm is given below:

Angle	0	10	20	30	40	50	60
Luminous Intensity	1412	1366	1340	1230	1088	786	444
Angle	70	80	90	100	110	120	130
Luminous Intensity	286	156	114	96	82	43	12

Determine the total lumen output using Zonal Integration method. Also, calculate DLOR and ULOR. *(03)*

5A. What is the necessity of screening device? Explain the different types of screening devices. **(04)**

5B. A room of length 5 m, width 3 m and height 3 m is to be illuminated with ceiling mounted luminaires. Determine the glare index using the glare index table given below:

Room Dimension		GI
X	Y	
1H	2H	12
1H	3H	14
2H	2H	17
2H	3H	19

(03)

5C. Explain how the thermal test is conducted on a luminaire. What are the inferences obtained from the test? **(03)**