Reg. No.



I SEMESTER M.TECH (ENERGY SYSTEMS & MANAGEMENT)

END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: LIGHTING SCIENCE: DEVICES AND SYSTEMS [ELE 5104]

REVISED CREDIT SYSTEM

Time:	3 Hours		Da	ate: 01	Decen	nber 20	16		MA	AX. MAR	KS: 50
Instru	ctions to Candio	dates:									
	Answer AL	L the ques	tions.								
	 Missing dat 	a may be s	suitably a	ssumed.							
1A.	Draw a neat sketch of spectral energy distribution curve of black body radiator. What are the important observations?										(04)
1B.	A lamp having a uniform Candle Power of 200 in all directions is provided with a reflector which directs 60% of the total light uniformly on to a circular area of 10m diameter. The lamp is hung 6m above the area. Calculate the illumination:										
	1. At the c	entre									
	2. At the e	dge of the	surface v	with and	without	reflecto	r.				
	Also determine the average illuminance over the area with and without the reflector.										(04)
1C.	An incandescer 10cm. Find the	nt lamp as luminance	sumed s e and lum	pherical linous ex	has a ur kitance o	niform ir f the san	ntensity ne	of 200cc	l and dia	ameter of	(02)
2A.	From the fundamentals, derive an expression for the evaluation of luminous flux. List the three methods used to evaluate the luminous flux.									(03)	
2B.	Define Purkinje	e Shift. Exp	lain the s	same wit	th releva	nt diagra	am.				(03)
2C.	Write a note on	Color Tria	angle and	l CIE Chi	romatici	ty diagra	m with	respect t	o Color 7	Гheory.	(04)
3A.	Explain the factors which effect the luminous efficacy of fluorescent lamp.								(03)		
3B.	What are Induction lamps? List the difference between LED and induction lamps.									(04)	
3C.	A small light source with intensity uniform in all directions is mounted at a height of 10m										
	above a horizon	ntal surfac	ce. Two p	oints A	and B bo	oth lie or	the sur	face wit	h point A	A directly	(02)
	beneath the sol	Irce. How	Iar is B II		the mum	ination	at B IS OI	lly 1/10	as that (n at A?	(03)
4A.	With the help o	f a neat sk	etch exp	lain the v	working	and con	structior	n of a me	tal halid	e lamp.	(04)
4B.	The photometr	ic data of	a prisma	atic, twir	ı lamp fl	uoresce	nt lumin	aire is g	given in t	the table.	
	The rated outp and ULOR using	ut of each g zonal int	lamp is	2450 lm method.	1. Detern Also det	nine the	total lur FFR. UFI	ninous f FR and D	lux outp FFR	ut, DLOR	
	A (degree)	5	15	25	35	15	55	65	75	85	
	L (Cd/Klm)	610	406	23	2.00	142	123	112	102	55	
	θ (degree)	95	105	115	125	135	145	155	165	175	
	I (Cd/Klm)	15.7	10.5	7.8	5.6	4	2.7	1.9	1.4	0.9	(06)
											(00)

5A.	Explain the CIE classification of luminaires.					
5B.	With relevant sketches, explain the optical properties and applications of circular and parabolic reflectors.	(04)				
5C.	Briefly explain the function of an Electronic ballast, in view of recent developments in lamp technology.	(03)				