Reg. No.



MANIPAL INSTITUTE OF TECHNOLOGY

(A constituent Institution of MAHE, Manipal)

VII SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING) MAKE-UP EXAMINATIONS, DECEMBER 2018

SUBJECT: LIGHTING CONTROLS: TECHNOLOGY AND APPLICATION [ELE4022]

REVISED CREDIT SYSTEM

Time	e: 3 Hours	Date: 29 December 2018	Max. Marks: 50)
Instructions to Candidates:				
	 Answer ALL the questions 			
	 Missing data may be suital 	bly assumed.		
1A.	What are the owner's expectat	ions concerning energy savings and occupant satis	faction? (02)	1
1B.	Discuss in detail i) coverage a occupancy sensors.	rea and pattern ii) sensor technology and iii) ti	me delay of (06))
1C.	Discuss the occupancy sense applications.	or and photo sensor variables to be consider	red for the (02))
2A.	Explain control zone decision strategies and energy codes.	factors with emphasis on that matches daylight ba	ased control (05))
2B.	Mention the strategies for imp	roving occupant comfort and control in LEED pr	ractice (05))
3A.	With a neat block diagram exp on window blind control.	lain daylight-artificial light integrated scheme, wit	th emphasis (04))
3B.	Discuss integral reset control w	rith neat diagrams , also emphasis on calibration m	nethodology (04))
3C.	Draw a neat flow chart for dayl	ight estimation using system identification technic	ques. (02)	
4A.	Estimate LPD of an office roo class hours, using LED lumi MF=0.80, 24 hours working, during break time.	om of area $15 \times 10 \text{m}^2$, designed for 500lux unifor naire of 4000 lm, 30W for the following case out of which 3 hours break time. Provide half the	rmly during es. CU=0.8, e light level	
	i) Scheduled occupancy			
	ii) Occupancy sensor and Pho	otosensor based control, light dependency factor a	average 0.7.	
	iii) Payback period with contro control is Rs. 1000/luminaire	ol when the additional cost of sensor integrated lu	minaire and	
	Unit cost/ kWh is 6, working f	for 300 days.	(05))
4B.	Explain Communication protoc	ols and networking for lighting controls.	(05))
5A.	Draw a neat block diagram of PWM dimming.	LED luminaire with driver and power supply and	d explain (05))
5A.	Explain i) spatial response and	ii) spectral response of photo sensor	(05))