Ref. No....Ex/PG/IlluE/T/128A/2024

MASTER IN ILLUMINATION ENGG FIRST YEAR SECOND SEMESTER EXAMINATION, 2024

(1st /2nd Semester/~~Repeat/Supplementary/Annual/Bi-Annual~~)

SUBJECT LIGHTING POWER CONDITIONING, MONITORING AND CONTROL

(Name in full)

PAPER.....

Time : ~~Two hours~~/Three hours/~~Four hours/Six hours~~

Full Marks 100

50 marks for each part

Use a separate Answer-Script for each part

No. of questions		Part I	Marks
		Question-1 is Compulsory & answer 2 from the rest (20+30=50)	
		Answer any 4 of Question No. 1 (5 X 4=20)	
1.		**Justify or do the necessary corrections, if any for the following statements**	
	i)	Physical layer is a subset of program.	
	ii)	Active occupancy sensors are more effective than passive type occupancy sensor for a lighting control in a room.	
	iii)	Digital Signal Interface (DSI) is the best digital control protocol over the other digital protocols.	
	iv)	A Digital Addressable Lighting Interface (DALI) controller can be designed with any microcontroller.	
	v)	The Term Lighting Power Conditioning, Monitoring & Control with suitable.	
	vi)	Dimming strategy for any light source is same.	
2.	a)	Write the background of development lighting control protocol IES TM-23-11.	3
	b)	Discuss the steps to be followed for design and implementation of a lighting control system for entire building of Electrical Engineering Department, Jadavpur University. Take the help of basic theory of control systems and the elements of it to discuss the assessment of your designed system.	7
	c)	Write a note on Digital Lighting protocols.	5
3.	a)	Define Manchester encoding with respect to the conventional clock signal. How Manchester encoding technique has been adopted in DALI system development?	8
	b)	Write a note on DALI addressing.	4
	c)	How the dimming of a LED based system can be incorporated with DALI system.	3

[Turn over

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MASTER IN ILLUMINATION ENGG FIRST YEAR SECOND SEMESTER EXAMINATION, 2024

(1st /2nd Semester/~~Repeat/Supplementary/Annual/Bi-Annual~~)

SUBJECT...LIGHTING POWER CONDITIONING, MONITORING AND CONTROL

(Name in full)

PAPER.....

Full Marks 100

Time : ~~Two hours~~/Three hours/~~Four hours/Six hours~~ **50 marks for each part**

Use a separate Answer-Script for each part

No. of questions		Part I	Marks
3.	a)	Write down the basic parameters used to specify a DALI system.	4
	b)	What are the fundamental criteria based upon occupancy sensors are selected?	5
	c)	Explain the execution steps of a lighting design of a space by explaining the role of topology, network, physical layers, program and communication protocols.	6
4.	a)	Write a note on Internet of Things (IoT) based lighting system.	5
	b)	How smart lighting system is different from automatic lighting system, adaptive lighting system and intelligent lighting system?	5
	c)	Compare DALI & DMX system as a lighting control system from application point of view	5

Ref. No. EX/PG/IlluE/T/128A/2024

M. E. IN ILLUMINATION ENGG. FIRST YEAR SECOND SEMESTER EXAMINATION, 2024
(1st Year 2nd Semester)

SUBJECT : LIGHTING POWER CONDITIONING, MONITORING AND CONTROL

Full Marks -100
(50 marks for this part)

Time : Three hours

Use a separate Answer-Script for each part

No. of questions	Part II (50 Marks) Answer any two questions	Marks
1. a)	How lighting control can be achieved through various control strategies? Explain with examples.	10
b)	Discuss about different control levels in any lighting management system.	8
c)	Define radiated emission and radiation susceptibility.	2
d)	Why dual sensor technology is used for occupancy-based lighting control system?	5
2.a)	Describe the strategy and design procedure of a typical conference room lighting control system.	10
b)	Mention the sources of EMI in lighting applications. Also mention their effects in such application areas.	2+2
c)	Compare the open loop and closed loop lighting control system. Mention the functions of photosensor in this context.	4+2
d)	Show the relation between lighting control strategy and their energy saving potential with suitable diagram.	5
3.a)	Define Electromagnetic Interference (EMI) & Electromagnetic Compatibility (EMC). Write down the differences between Common Mode & Differential Mode noises.	4+2
b)	Draw the block diagram of an electronic ballast of fluorescent lamp. Briefly explain the functions of each block.	10
c)	Write down the objectives of lighting control.	5
d)	Define Lighting Management and Building Management system.	4
4.a)	Compare the performance of various occupancy-based lighting control systems.	15
b)	Discuss about different types of lighting control integration levels.	10