Reg. No.									

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent Institution of MAHE, Manipal)

VII SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

END SEMESTER EXAMINATIONS, NOVEMBER 2018

SUBJECT: LIGHTING CONTROLS: TECHNOLOGY AND APPLICATION [ELE 4022]

REVISED CREDIT SYSTEM

Time: 3 Hours **Date: 27, November 2018** **Max. Marks: 50**

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A.	Discuss basic control strategies for lighting.	***(02)***
1B.	Differentiate technology, characteristics and proposed application of PIR, Ultrasonic and dual technology occupancy sensors.	***(06)***
1C.	Draw a neat flow chart for occupancy based automatic shut off as per energy codes.	***(02)***
2A.	Plan for control zoning that matches daylight based control strategies to specific lighting loads.	***(05)***
2B.	Mention the strategies for achieving energy efficiency as per LEED practice	***(03)***
2C.	Mention the key points of commissioning of lighting controls	***(02)***
3A.	With a neat block diagram explain daylight-artificial light integrated scheme, with emphasis on window blind control.	***(04)***
3B.	Differentiate open loop proportional and closed loop daylight responsive control with neat diagrams. Discuss the difference in calibration in each case.	***(04)***
3C.	Draw a neat flow chart for daylight harvesting control as per energy codes	***(02)***
4A.	Estimate LPD of a class room of area 12x10m^2, designed for 300lux uniformly during class hours, using LED luminaire of 4000 lm, 30W for the following cases. CU=0.8, MF=0.805. Class timings 8amto5pm, break time 10am to 10.30am, 3pm to 3.30pm and 12.30 to 1pm.Provide half the light level during break time. i) Scheduled occupancy ii) Occupancy sensor and Photosensor based control, light dependency factor average 0.8. iii) Payback period with control when the additional cost of sensor integrated luminaire and control is Rs. 1000/luminaire	***(05)***
4B.	Explain mesh networking for lighting control highlighting, device types, topologies, benefits and standards	***(03)***
4C.	Explain analog dimming for LED luminaire.	***(02)***
5A.	Explain intelligent lighting control with sequence of operation.	***(04)***
5B.	Discuss the selection of appropriate wireless lighting control based on range of devices.	***(03)***
5C.	Explain two standard protocols for lighting controls.	***(03)***