Ref.No. EX/EE/5/T/512/F 2019

B.E.E.(Evening) 5th Year; 1st Semester Examination 2019
Advanced Illumination Engineering

Time: 3 hours Use Separate Answer script for each part Full Marks:100

Part-I
ANSWER ANY THREE QUESTIONS
QUESTION NO.1 CARRIES 18 MARKS

Q.1. A) Briefly discuss on the followings-
i) Threshold size; ii) Visual Acuity; iii) Minimum Perceptible contrast;
iv)Contrast sensitivity
B) Explain additive and subtractive colour theory with suitable diagram.

12+6=18

Q.2. A) Explain the following terms related to laser generation -
i) spontaneous emission; ii) stimulated emission; iii) active medium
B) What do you understand by 'population inversion'? Why pumping of energy from external source is essential to achieve the state of population inversion in lasing medium?

12+4=16

Q.3. A) Discuss the followings –
i) Planckian Locus; ii) Dominant wavelength and Purity; iii) CIE Standard illuminant.
B) Draw schematic diagrams of 3-energy level and 4-energy level lasing medium and compare between them in terms of energy efficiency.

10+6=16

Q.4. A) Describe the computational steps to determine object chromaticity according to CIE 1931 Chromaticity system, from spectral reflectance data of the test object when illuminated by a CIE standard illuminant.
B) Write down Grassman's colour mixing law and derive the expression of chromaticity coordinate of the resultant colour obtained from mixture of two individual colours.

8+8=16

Q.5. A) Three colour fluorescent lamps have the following data. Compute chromaticity of the resultant radiation produced by the mixture of them.

Lamp	W	x	y	lm/W
A	40	0.6	0.3	15
B	40	0.5	0.4	25
C	20	0.2	0.3	35

B) Compute the tristimulus values and chromaticity of a test lamp from the following data-

λ (nm)	M_λ (W/cm^2.nm)	x_λ	y_λ	z_λ
490	1.86	0.0320	0.2080	0.4652
550	3.23	0.4334	0.9950	0.0087
680	7.67	0.0468	0.0170	0.0000

8+8=16

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BACHELOR OF ENGINEERING (ELECTRICAL ENGINEERING) FIFITH YEAR

.....EXAMINATION, 20 19

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

SUBJECT..... ADVANCED ILLUMINATION ENGINEERING .....

(Name in full)

PAPER.....

Full Marks 100

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

Use separate Answer-Script for each part

No. of questions	Part II Answer any three, (16X3=48), two marks for organized answer.	Marks
1.(a)	What do you mean by SPD curve for a light source?	4
(b)	What is the information generally available from SPD of light sources?	4
(c)	'Photometry is a part of radiometery but vice versa is not always true' — Justify.	4
(d)	What is the difference between visual photometry and physical photometry?	4
2.(a)	Write a note on -selection criteria of electromagnetic ballast for a fluorescent lamp.	4
(b)	Discuss about the different key specifications for electromagnetic ballast.	6
(c)	Discuss with clear diagram about the different ignitor connection available for HID lamps.	6
3.(a)	What are different procedures to measure lumen output of a light source?	6
(b)	What are the classifications of different flood lighting luminaires?	6
(c)	Write a short note on : Goniophotometers used for the measurement of intensity data of flood light luminaire.	4
4.(a)	Why lighting control is necessary?	6
(b)	Discuss about the different control strategies and protocol used for lighting control.	6
(c)	Write a note on DALI.	4
5.(a)	Write a note on : Coordinate systems used for photometry .	4
(b)	What are the primary functions of a luminaire?	3
(c)	Discuss about the photometric characteristics of indoor luminaires.	9