Ref. No. Ex/ PG /Illu TD /T /113A /2024

M.TECH. ILLUMINATION TECH. & DESIGN EXAMINATION
(1st year, 1st Semester) 2024

SUBJECT: - Lighting Codes & Energy Efficient Lighting Systems

Full Marks 100
(50 marks for each part)

Time: Three (03) hours

Instruction: Students have to answer **ANY FIVE (05) questions** from this part. Each question carries 10 marks. To-the-point answer and neatness will be appreciated. Use separate answer script for Part-I and Part-II.

<table>
<tr><th>No. of Questions</th><th>Part- I</th><th>Marks</th></tr>
<tr><td>1.</td><td>Lamp datasheet of a GLS lamp prepared as per IS-418 consists of the following information:

(i) B-22d (ii) MF= 85% (iii) Dmax= 63 (iv) K60 (v) Finish: F
Explain the technical significance of each term in brief.</td><td>5×2
=10</td></tr>
<tr><td>2.</td><td>(a) Life test performed on a batch of 100W GLS lamps with LTQ=12 has been truncated at 110% of nominal life. The nominal life of the lamps is 1500 hour. The following data is obtained after the life test:
<table>
<tr><th>Lamp no.</th><th>Life (hour)</th><th>Lamp no.</th><th>Life (hour)</th></tr>
<tr><td>1</td><td>1480</td><td>7</td><td>1530</td></tr>
<tr><td>2</td><td>1340</td><td>8</td><td>1489</td></tr>
<tr><td>3</td><td>X</td><td>9</td><td>1397</td></tr>
<tr><td>4</td><td>1299</td><td>10</td><td>1503</td></tr>
<tr><td>5</td><td>1475</td><td>11</td><td>X</td></tr>
<tr><td>6</td><td>X</td><td>12</td><td>1435</td></tr>
</table>
What should be the missing value ‘X’ to be considered during computation? Compute truncated average life of the lamp.

(b) What are the benefits of accelerated life test? How accelerated life can be converted to equivalent rated life?</td><td>6+

4
=10</td></tr>
<tr><td>3.</td><td>(a) Elaborate selection criteria of electronic ballast according to NLC-2010.

(b) Explain the necessity of using capacitor in HID lamp system.</td><td>7+

3
=10</td></tr>
</table>

[Turn over

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No. of Questions	Part- I	Marks
4.	**(a)** Prepare a list of equipment necessary for LM-79 testing. **(b)** Elaborate the conditions to be satisfied during LM-79 testing. **(c)** Make a list of electrical, photometric and colourimetric parameters which should be presented in an LM-79 report.	3+ 3+ 4 =10
5.	**(a)** Briefly explain the objectives of a lighting designer. **(b)** Elaborate any three lighting design criteria.	4+ 6 =10
6.	Suppose you have been asked to design lighting for an IT office space. Which technical aspects will you consider? Give justification to each aspect in detail.	10
7.	**(a)** Classify lamps according to NLC-2010. **(b)** Write down the key differences between CFL-I and CFL-NI. **(c)** How can we classify fluorescent tube lights based on dimensions?	3+ 4+ 3 =10

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M.TECH ILLUMINATION TECH AND DESIGN

First Year First Semester Exam – 2024

Subject: LIGHTING CODES & ENERGY EFFICIENT LIGHTING SYSTEM

Time: Three hours Full marks: 100 (50 marks for this part)

Use Separate Answer Script for each part

No. of Question	**PART –II** **ANSWER Q. No 1 AND ANY TWO FROM REMAINS**	MARKS
1.	Write the short notes (Any four) (a) Division of lighting zones (b) Photo sensor and occupancy sensor (c) Glazing materials (d) Integration with electric lighting controls (e) Daylight redirection devices and tubular daylight devices (f) Vertical Fenestration and sky light	**5×4**
2.	(a) Explain the importance of energy efficient lighting design. (b) Briefly describe the methods of illumination system design for energy efficiency.	**7+8**
3.	(a) Write the conditions for daylight integration in a building. (b) Describe Various types of On/Off control techniques of light sensors for daylight integration in a building.	**6+9**
4.	(a) Explain the key components which are required for a suitable daylighting system design. (b) Mention the daylight design considerations in a building with respect to assessing resource availability.	**8+7**