

UNIVERSITY COLLEGE LONDON

University of London

EXAMINATION FOR INTERNAL STUDENTS

For the following qualifications :-

M. Sc.

ESGL6: Lighting: Applied Calculations

COURSE CODE : **ENVSGL06**

DATE : **20-MAY-02**

TIME : **14.30**

TIME ALLOWED : **2 hours**

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TURN OVER

UNIVERSITY OF LONDON

MSc DEGREE IN BUILT ENVIRONMENT 2002
for Internal Students of University College London

ESGL6: Lighting: applied calculations

Answer **TWO** questions.

All questions carry equal marks. Use annotated sketches.

1. What are the main factors that influence discomfort glare? How are these factors combined in the Unified Glare rating (UGR) formula? Explain how each individual term of the UGR is calculated.

The basic UGR formula method has the greatest applicability but for more general use luminaire manufacturers will prepare and publish tabular UGR data in a standard form for specific luminaires. State the assumptions on which this work is based. How will the UGR of a lighting installation be related to recommended limits in the *SLL Code for Interior Lighting*?

2. In 1955 the Commission Internationale de L'Eclairage (CIE) drew up a preliminary list of lighting quality factors such as:-

1. the graduation of brightness and contrast in the field of view
2. the presence/absence of centres of attention
3. the directional character of the lighting.

These factors have been subject to the attention of some of the lighting community's most inventive researchers.

You are asked to identify which features of a lighting installation contribute to these factors and to indicate appropriate lighting quality metrics.

3. Analysis of optical radiation is carried out using a monochromator which contains a diffraction grating. What are the theoretical principles involved in dispersing white light into a spectrum for analysis?

Describe the stages in determining the chromaticity coordinates of an unknown test white lamp by measuring its spectral power distribution.

4. Outline possible sources of error in illuminance and luminance meters.

What precautions are taken when performing *field* measurements of interior lighting and road lighting?

END OF PAPER