

University of London

EXAMINATION FOR INTERNAL STUDENTS

For The Following Qualification:-

M.Sc.

ESGL3: Lighting: Current Research Issues

COURSE CODE : ENVSGLO3

DATE : 09-MAY-03

TIME : 10.00

TIME ALLOWED : 3 Hours

UNIVERSITY OF LONDON

MSc DEGREE IN BUILT ENVIRONMENT 2003
for Internal Students of University College London

ESGL3: Lighting: current research issues

Answer **FOUR** questions.

All questions carry equal marks. Use annotated sketches.

1. From the 1930s to the 1950s Modernism was known as the “International Style” – an architecture of formal purity which was adopted throughout the Western world. Using three representative examples, describe how Modernist architects controlled, modified and exploited daylight in their buildings and indicate the corresponding impact on the visual environment.
2. In an extended discussion, identify the most important developments in lighting technologies for the future and identify their impact on (i) built form, (ii) the redefinition of architectural space and (iii) the user experience.
3. The National Illumination Committee of Great Britain (CIE-UK) has commissioned a Scoping Study to review and evaluate what is currently known about the effect of lighting on human well-being and performance, in both indoor and outdoor situations, under natural and artificial lighting. A report is expected in September 2003.

You are asked to *identify* future research topics in this area and *prioritise* future research activity, taking into consideration the likely benefits, including the economic impact.

4. Prepare a table that compares common lamp types against typical lamp operating and performance characteristics.
Use this table to suggest, with careful reasoning, possible lamps for the following lighting applications:
 - a) a school assembly hall/gymnasium (high-bay luminaires)
 - b) an open-plan office with 1.5m high partitions (direct/indirect luminaires)
 - c) bookstacks in a library (linear asymmetric luminaires).

TURN OVER

ESGL3: Lighting: current research issues *continued*

5. With reference to the research literature, explain why it has been suggested that daylight and sources rich in 'blue light' can 1. be regarded as more efficient and 2. make a contribution to visual clarity.

6. Psychological characteristics, such as mood and alertness, can be affected by the qualities of the lit environment. Describe the possible physiological mechanisms and comment on the prospects for the control of lighting to improve human comfort and productivity.

7. You have been appointed as the lighting consultant for a new primary school which incorporates a central atrium, a variety of class and teaching bases and a multi-purpose hall.

Outline the lighting *calculations* that you would prepare to check the daylighting and electric lighting performance of your proposed lighting systems in each of the areas listed above.

8. Which techniques may be used for visualizing or simulating the lit appearance of a proposed lighting installation for presentation to clients and other members of the design team ?

Comment on the strengths and weaknesses of each technique in terms of their accuracy and usefulness.

END OF PAPER