NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF THE BUILT ENVIRONMENT

DEPARTMENT OF ARCHITECTURE
BACHELOR OF ARCHITECTURAL STUDIES (HONOURS) DEGREE

PARTIII – END OF SECOND SEMESTER EXAMINATIONS – JUNE 2007
AAR 3203 – BUILDING SERVICES

Instructions ***Time : 3 Hours***
Answer any four (4) questions
Each Question carries (25) twenty five marks.

Question 1

Write brief notes on the importance of:-

a) (i) Room index in lighting design of a room.
(ii) Natural light in illumination of the room during lighting design.

(5)

b) A workshop is 14m by 8m x 4m high has work benches 1m high. Discharge lamps each with an output of 3 700 lm and to be fitted in aluminum industrial reflectors at ceiling level. . The surface has reflectances 0,7 for ceiling and 0,5 for walls. The maintenance factor is 0,8. The illuminance required on the work benches is 500lx. The luminaire fitting is Aluminum Industrial reflector.

(i) Find the utilization factor.
(ii) Calculate the number of lamps required and suggest a lay out for them.

Use table 1 provided.

(5)

Question 2

(a) Write brief notes on

(i) emergency electricity for buildings.

(ii) How buildings can be protected from lightning.

(15)

Question 3

(a) Calculate the actual reverbaraium time for a hall with a volume 5000m³, given the following data for a frequency of 500Hz.

Surface area	Absorption coefficient

500m² brickwork
600m² plaster on solid
100m² fibre board 13mm solid backing
300m²carpet
70m²curtain medium weight
400 seats empty fabric per seat

- **Use Absorption coefficient table provided**

(b) (i)A lecture hall with a volume of 1500m³ has the following surface areas and finishes and absorption coefficients (500Hz)

Walls, plaster on brick	400m² (0,02)
Floors, plastic tiles	300m² (0,05)
Ceiling, plaster board	300m² (0,10)

Calculate the area of acoustic tiling needed on the walls to achieve this reverberation time (absorption coefficient of tiles = 0.4 at 500 Hz).

(25)

Question 4

(a) Write brief notes on lifts lay out within a building.

(10)

(b) Give advantages of escalators over lifts.

(5)

(c) Write brief notes on how you can determine the number of lifts that should be provided on a building.

(10)

Question 5

a) Discuss fire classification on buildings

(12 ½)

b) Discuss all possible fixed fire fighting systems that can be used in buildings.

(12 ½)