NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF ARCHITECTURE AND QUANTITY SURVEYING

DEPARTMENT OF ARCHITECTURE
BACHELOR OF ARCHITECTURAL STUDIES (HONOURS) DEGREE

PART III SECOND SEMESTER EXAMINATIONS – MAY 2003
AAR 3202/AQS BUILDING SERVICES II

Instructions   _Time : 3 Hours_

Answer All Questions

QUESTION 1

(a)   Write brief notes on
    (i)   electric accessories and
    (ii)   factors affecting telephone points within a building.

    [10]

(b)   An electric installation designer for any building is concerned with the wiring circuits and the way the outlets (accessories) are to be served. Outline the wiring circuits within the building and explain how the wiring and outlets are interdependent.

    [10]

(c)   (i)   Calculate the number of luminaires needed to provide an office with an average illumination of 750lx on the working plane.   [10]

    The dimensions of the room are

    (+) length a   =   15m

    (+) width b   =   15m

    (+) height h   =   2,85m

    (+) height of working plane = 0,75m

    (+) reflectancies of ceiling, walls and working plane are 0,70; 0,50 and 0,10 respectively

    (+) type of luminaire TBN 283 which is twice TL D 58 00 lm   [10]

    (ii)   Use a diagram to suggest a possible arrangement of the luminaires.

    [4]

Use figure 1 on page 3 for your calculations.

Table 4

Lift speed m/s	Rate of acceleration m/s^2
1	0,50
1.5	0,70
2,5	1,0
>2,5	2,5

Table 5

No of passengers	Entrance lobby loading time in seconds	Transfer time i.e. loading and unloading time at upper floor.
8	7	1
13	12	1,25
16	14	1,5
20	17	1,6

QUESTION 4

a) Discuss the importance of room acoustics. [4]

b) Explain in brief the materials and methods used to control the quality of sound in a building. [12]

c) A densing room has volume of 6000 m³ and a reverberation time of 1,5 seconds. Calculate the amount of extra absorption required to obtain a reverberation time of 1 second. [9]

QUESTION 5

a) Discuss factors that influence the location of lift within a building. [6]

b) Describe how you can install lifts/escalators in a four storey building. [7]

c) Determine the number of lights in a rectangular educational building, single occupancy having ground with 10 upper floors with uniform floor to floor height of 3 m and main hobby at ground floor. Gross floor area is 2000 square metres. at all floor's . Quality of service is fair, use tables below for your calculations if speed of the lifts is 1,5m/s and lift capacity is 8 people. [12]

Table I

Accepted interval or waiting in seconds	Quality
20 to 25	Excellent
30 to 35	Good
35 to 40	Fair
45	Poor
over 45	unsatisfactory

Table 2

Type	Occupancy area/per person
1. Residential	12,5
2. Educational	4
3. Institutional	15
4. Business	10
5. Industrial	10

Table 3

No of upper floors served	No of passenger/trip (car capacity)					
	10	12	14	16	18	20
14	7	8	9	9	10	11
12	7	8	9	9	10	10
10	6	7	8	8	9	9
8	6	6	7	7	8	8