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

DEPARTMENT OF ARCHITECTURE
BACHELOR OF ARCHITECTURAL STUDIES (HONOURS) DEGREE

PART III SUPPLEMENTARY EXAMINATIONS – JULY 2005
AAR 3203 – BUILDING SERVICES

Instructions   *Time: 3 Hours*

Answer Question 1 and any other 2.

QUESTION 1

(a)   Discuss the necessity of air conditioning in a building.   [5]

(b)   Write brief notes on fans used for air conditioning in buildings   [10]

(c)   A room measuring 20m x 10m x 3m requires ventilating by means of a fan and ductwork to provide six air changes in the room. If the average velocity of air flow in the duct is to be 2m/s, calculate the diameter of the main circular duct required for the room.   [8]

(d)   With the aid of a diagram explain how plant rooms and ducting systems can be installed in tall buildings.   [10]

Question 2

(a)   Discuss how you can protect a residential building from lightning.   [10]

(b)   Explain the fire fighting mechanism you could employ for a hotel room where linen is kept.
                                                                                                      [8]

(c)   If the hotel is more than 75m tall explain how water can be used to fight the fire at any floor.
                                                                                                     [10]

(d)   Suggest the emergency electricity that can be installed for such a hotel.   [5]

Question 3

(a)   Discuss how the electric and telephone wiring can be facilitated into a tall commercial building.
                                                                                                     [10]

(b)   Discuss the importance of the following in lighting design.

(i)   Room index   [4]

(ii)   Lluminaries   [4]

(c)   The illuminance of a certain room is 900 *lx.* The dimensions of the room are 7m x7m x 3m high. Maintenance factor is 0,85 and utilization factor is 0,45.

        Calculate

        (i)   The room index if the desks are 0,56m above the floor.

        (ii)   The rate output of luminaires if they are 29.

        (iii)   Suggest a layout for them.   [15]

Question 4

(a)   Explain in brief the materials and methods used to control the quality of sound in a building.

[10]

(b)   Discuss various factors that influences selection of escalators instead of lifts for different buildings.

[9]

(c)   Determine the number of lifts in a rectangular Institutional Governmental Building with single occupancy. Allow for a ground floor with 14 upper floors at a uniform floor to floor height of 3,28 metres. Gross floor area is 200 square metres at all floors. Quality of services is good. Use tables at the back for calculations. Assume lift speed to be 1,5m/s, capacity of lift being 20 persons, while type of door is power operated centre.   [15]