

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

DEPARTMENT OF ARCHITECTURE
BACHELOR OF ARCHITECTURAL STUDIES (HONORS) DEGREE

PART III SECOND SEMESTER EXAMINATIONS – MAY 2003
AAR 3204 CONTEMPORARY HISTORY AND THEORY OF ARCHITECTURE II

Instructions

Time: 3 Hours

You are to answer all four questions.
All questions carry equal marks. Sketches should accompany all answers where appropriate.

Question 1

Right now there is a lot of debate about "authorship". Dutch architect Rem Koolhaas has stated that he foresees that in future a "good" and successful architect will – first and foremost – be someone who is good at "editing". Do you agree with him? Or do you think it will become more and more important to have a "signature"? Write an essay investigating this idea of needing a "signature", and "editing".

Question 2

Briefly discuss three personal architectural theories in the 20th Century, and explain their contribution to the development of world architecture. Using sketches to illustrate with selected buildings.

Question 3

Explain the following movements, and describe their application in architectural terms: Rationalism, Brutalism, Deconstructivism, Environmentalism, Late Modern, High Tech, and Regionalism.

Question 4

Select one important 20th Century building which you either like or dislike, write a critique of it, and explain its significance in terms of design and theory of architecture.

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TABLE 2 contd

Recommended occupant load for various buildings

<i>Type</i>	<i>Occupancy area/per person</i>
1. Residential	12.5
2. Educational	4
3. Institutional	15
4. Assembly hall with	
(a) dance floor	0.6
(b) dining	1.5
5. Business	10
6. Mercantile	
(a) with basement	3
(b) with shops on uppers	6
7. Industrial	10
8. Storage	30
9. Hazardous	10

Probable number of steps.

<i>No. of upper floors served</i>	<i>Number of passenger/trip (car capacity)</i>					
	<i>10</i>	<i>12</i>	<i>14</i>	<i>16</i>	<i>18</i>	<i>20</i>
18	8	9	10	11	12	13
16	8	9	10	10	11	12
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
6	5	5	6	6	7	7

<i>Type of door operation</i>	<i>Capacity</i>			
	<i>8</i>	<i>13</i>	<i>16</i>	<i>20</i>
(a) Power operated single slide	3.8	3.8	—	—
(b) Power operated double slide	3.2	3.2	—	—
(c) Power operated centre opening	2.8	2.8	3.2	3.2
(d) Collapsible with attendant	2.5	2.5	3	3
(e) Collapsible without attendant	4	4	—	—

BLE I

Utilisation factors for some luminaires




Description of fitting	Typical outline LOR	Basic downward LOR %	Ceiling	Reflectances									
			Walls	0.7			0.5			0.3			
				0.5	0.3	0.1	0.3	0.3	0.1	0.5	0.3	0.1	
			Room index										
Aluminium industrial reflector, Aluminium or enamel high-bay reflector		70	0.6	0.39	0.36	0.33	0.39	0.36	0.33	0.39	0.35	0.33	
			0.8	0.48	0.43	0.40	0.46	0.43	0.40	0.46	0.43	0.40	
			1.0	0.52	0.49	0.45	0.52	0.48	0.45	0.52	0.48	0.45	
			1.25	0.56	0.53	0.50	0.56	0.53	0.49	0.56	0.52	0.42	
			1.5	0.60	0.57	0.54	0.59	0.57	0.53	0.59	0.55	0.53	
			2.0	0.65	0.62	0.59	0.63	0.60	0.58	0.63	0.59	0.57	
			2.5	0.67	0.64	0.62	0.65	0.62	0.61	0.65	0.62	0.60	
			3.0	0.69	0.66	0.64	0.67	0.64	0.63	0.67	0.64	0.62	
			5.0	0.71	0.68	0.67	0.69	0.67	0.65	0.69	0.66	0.64	
Near-spherical diffuser, open beneath		50	0.6	0.28	0.22	0.18	0.25	0.20	0.17	0.22	0.18	0.16	
			0.8	0.39	0.30	0.26	0.33	0.28	0.23	0.37	0.25	0.22	
			1.0	0.43	0.36	0.32	0.38	0.34	0.29	0.31	0.29	0.26	
			1.25	0.48	0.41	0.37	0.42	0.38	0.33	0.34	0.32	0.29	
			1.5	0.52	0.46	0.41	0.46	0.41	0.37	0.37	0.35	0.32	
			2.0	0.58	0.52	0.47	0.50	0.48	0.43	0.42	0.39	0.36	
			2.5	0.62	0.56	0.52	0.54	0.50	0.47	0.45	0.42	0.40	
			3.0	0.65	0.60	0.56	0.57	0.53	0.50	0.48	0.45	0.43	
			5.0	0.68	0.64	0.61	0.60	0.56	0.54	0.51	0.48	0.46	
Recessed louvre trough with optically designed reflecting surfaces		50	0.6	0.28	0.25	0.23	0.28	0.25	0.23	0.28	0.25	0.23	
			0.8	0.34	0.31	0.28	0.33	0.30	0.28	0.33	0.30	0.28	
			1.0	0.37	0.36	0.32	0.37	0.34	0.32	0.37	0.34	0.32	
			1.25	0.40	0.38	0.35	0.40	0.37	0.35	0.40	0.37	0.35	
			1.5	0.43	0.41	0.38	0.42	0.40	0.38	0.42	0.39	0.38	
			2.0	0.46	0.44	0.42	0.45	0.43	0.41	0.44	0.42	0.41	
			2.5	0.48	0.46	0.44	0.47	0.45	0.43	0.46	0.44	0.43	
			3.0	0.49	0.47	0.46	0.48	0.46	0.45	0.47	0.45	0.44	
			5.0	0.50	0.49	0.48	0.49	0.48	0.47	0.48	0.47	0.46	

TABLE 2

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

Lift speed m/s	Rate of acceleration m/sec ²
1	0'50
1'5	0'75
2'5	1'00
more than 2'4 to 8	2'50
more than 8 and floors more than 50	4'00

Handling Capacity

H = 10% to 15% for diversified tenancy office building.

H = 15% to 25% for single occupancy office building.

H = 7,5% for residential buildings.

- (c) Answer (i) or (ii)
- (i) At a certain frequency a wall transmits one per cent of the sound energy incident upon it. Calculate the sound reduction index of the wall at this frequency. [5]
- (ii) A hall has a volume of 5000m^3 and a reverberation time of 1,65. Calculate the amount of extra absorption required to obtain a reverberation time of 1 second. [5]
- (d) Differentiate between reverberation and reverberation time [2]

THE END

- (ii) What are the advantages of having a building air conditioned? [10]
- (iii) List and describe three types of filters used in air conditioning plant. [6]

(c) Answer (i) or (ii)

The main unit of central air conditioning is normally installed in the basement and the conditioned air is carried to different rooms through supply ducts and back by return ducts being aided by fans. Answer the following:

- (i) A fan absorbs 2,3 kw of power and discharges 2,5 m³/s when the impeller angular velocity is 1000 revolutions per minute. If the impeller angular velocity is increased to 1200 revolutions per minute, calculate the discharge in m³/s and the power absorbed for this new condition [6]
- (ii) 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. [6]

QUESTION 3

(a) Answer (i) or (ii)

Write brief notes on

- (i) Sizing and layout of the lift planning [10]
- (ii) Escalators also paying attention to their merits and demerits over lifts [10]

(b) Determine the number of lifts in a rectangular Institutional Government 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 2000 sq metres at all floors. Quality of service is good. Use tables at the back for your calculations. Assume lift speed to be 1.5 m/s, capacity of lift being 20 persons while type of door is power operated centre. [16]

Quality of Service

Accepted Interval or waiting time in seconds	Quality of Service
20 to 25	Excellent
30 to 35	Good
35 to 40	Fair
40 to 45	Poor
Over 45	Unsatisfactory

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