

Khulna University of Engineering & Technology

Department of Architecture

B. Arch 5th Year 1st Term Regular Examination, 2023

Course No: Arch 5155 Course Title: Fire Safety Design

Full Marks: 210

Time: 03 Hours

- N.B i) Answer any three questions from each section in a separate script
ii) Figures in the right margin indicate full marks

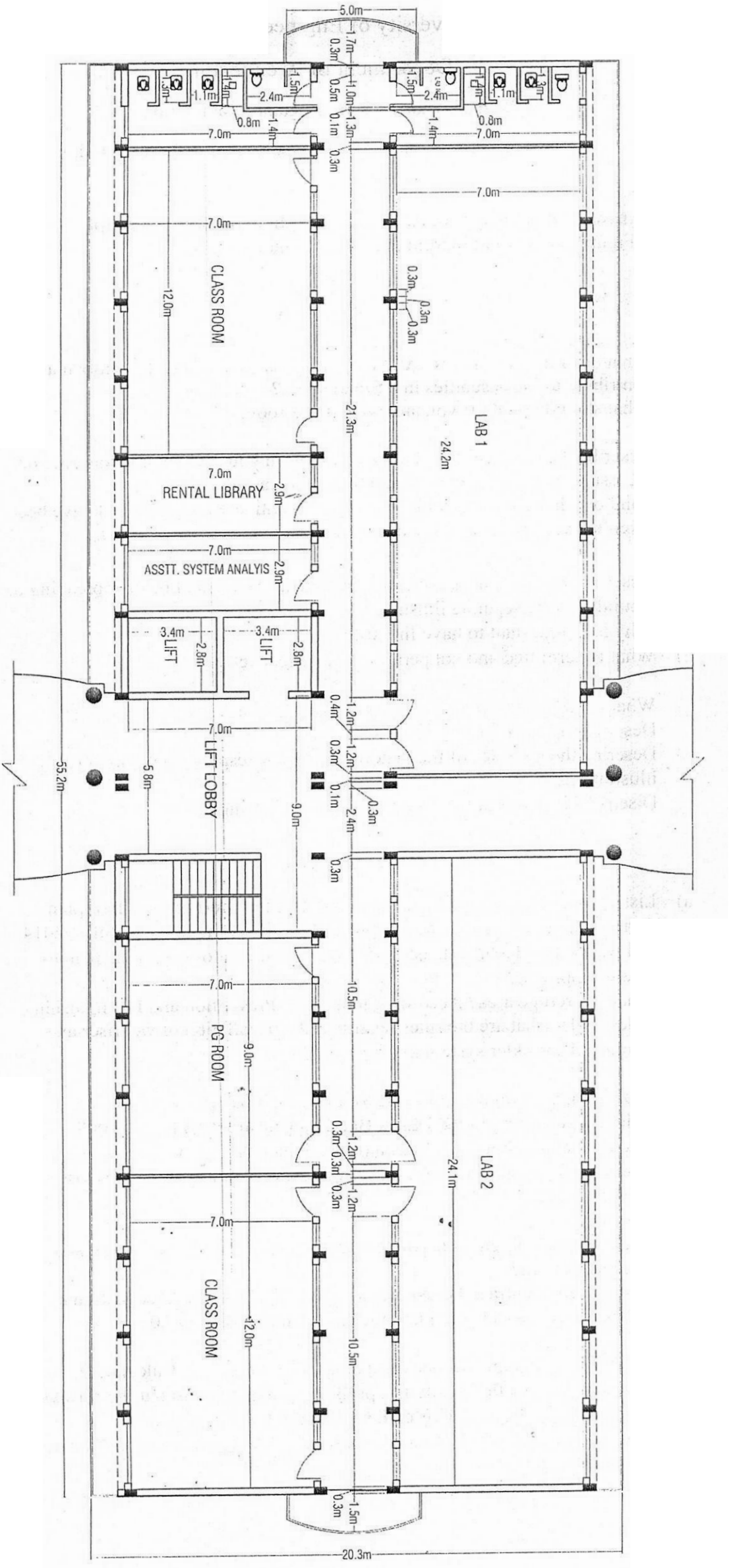


Section-A

1. a) Define the fire triangle with an illustration. 05
b) What do 'F.I.R.E.' and 'C.A.R.E.' acronyms mean? Which factors mainly contribute to the casualties in a fire incident? 10+15
=25
c) What should you do if you are trapped in a room? 05
2. a) Describe the event of the 'Baily Road Fire' in your own words focusing on the issues that caused the fire and the major casualties. 20
b) Point out the errors in action and what preventive measures could have been taken to avert the Bailey Road Fire incident? 15
3. a) Describe the three means of spreading fire in the context of fire spreading in a building with separate illustrations. 15
b) Why is it important to have fire drills? 10
c) What is permitted and not permitted in a fire safety drill? 10
4. a) What is the perception of an architect in case of a fire safety incident? Describe his/her role. 10
b) Describe the ten rules of the material's thermal response with proper illustrations. 20
c) Discuss briefly about the limitations of fire-fighting. 05

Section-B

5. a) List the components that must be included in the fire-fighting floor plan during submission under the fire prevention and extinguishing Rules, 2014, and what other documents needed to be submitted along with the plan to receive approval? 15+05
=20
b) What is a refuge area? According to the Fire Prevention and Extinguishing Rules, 2014 what are the rules regarding the installation of wet riser and automated sprinkler system in a building? 05+10
=15
6. a) Explain the general requirements for the design of egress systems in buildings according to the Dhaka Building Construction Rules, 2008. 15
b) Discuss the importance of continuous and unobstructed ways to exit travel. 10
c) Describe the components of a means of egress as outlined in the BNBC 2020 document. 10
7. a) What are the differences between a Wet riser system and an Automated sprinkler system? 15
b) Compare and contrast the requirements for exit facilities in educational buildings versus healthcare facilities as per the BNBC, 2020. 20
8. a) Determine the number of occupants for the given layout. Calculate the width of the exit for this floor with the sprinkler system and without the sprinkler system. As attachments **Tables 4.3.1** and **4.3.2** are provided. 25
b) Describe whether the position and number of all types of floor exits comply with the BNBC, 2020. 10



Layout Plan for Q.8(a) & Q.8(b).

Table 4.3.1: Occupant Load Factor

Occupancy		Unit of Floor Area in m ² per Occupant*
A	Residential	18 gross
B	Educational:	
	Class room	2 net
	Preschool	3.5 net
C	Institutional	12 gross
D	Health Care:	
	In patient areas	15 gross
	Out-patient areas	10 gross
I	Assembly:	
	with fixed seats	Number of seats designed.
	with movable seats	0.93 net
	standing space only	0.37 net
	with table and chairs	1.5 net
	Passengers that can be unloaded simultaneously to a terminal or a platform	0.15 net
E	Business: Office Space	3 gross
Occupancy		Unit of Floor Area in m ² per Occupant*
F	Mercantile:	
	Retail sales Area, Ground floor or Basement	2.3 net
	All other floor	4.6 net
G	Industrial	10 gross
H	Storage	20 net
K	Garages and open parking structures	23 net
L	Utility	Actual occupant load
M	Miscellaneous Building	Actual occupant load

* As per Sec 3.5.1(b) of this Chapter, design occupant load shall be calculated and any fraction shall be rounded to next higher integer value. Width of all components of egress system shall satisfy requirements of specified in the Table 4.3.2

Table 4.3.2: Required Width per Occupant

Occupancy		Buildings without Sprinkler System (mm per person)			Buildings thoroughly Sprinkled (mm per person)		
		Stairways	Ramps & Corridors	Doors	Stairways	Ramps & Corridors	Doors
A	Residential						
B	Educational						
E	Business						
F1, F2	Mercantile	8	5	4	5	4	4
G	Industrial						
H	Storage						
C1, C2	Institutional	8	5	4	5	5	4
C3, C4, C5	Institutional	10	5	4	8	5	4
D	Health Care	25	18	10	15	12	10
I	Assembly						
F3	Mercantile	10	7	5	7	5	5
J	Hazardous	8	5	4	8	5	4
K, L, M		8	5	4	5	4	4

Note: width of the components of egress shall be divided by value specified in this table to determine the maximum allowable occupant load served by them.



Khulna University of Engineering & Technology

Department of Architecture

B. Arch 5th Year 1st Term Regular Examination, 2023

Course No: CE-5125 Course Title: Project Planning and Construction Management

Full Marks: 210

Time: 03 Hours

- N.B. i) Answer any three questions from each section in separate script
ii) Figures in the right margin indicate full marks

Section-A



1. a) Define following terms. 09
i) Time value of money
ii) MARR
iii) Cash Flow
- b) For or a construction project you have to deposit 500,000 Taka at the end of next year. This expense will increase due to the inflation by 100,000 taka for only 20 years thereafter then cease. Determine the equivalent a) present worth & b) annual series amount for this projects maintenance. The ROR= 12%. 13
- c) Determine the differences in the present worth value of the following two commodity contracts at an interest rate of 8% per year. 13
Contract 1 has a cost of \$10,000 in year 1; Cost will increase at a rate of 4% per year For 10 years; Contract 2 has the same cost in year 1, but cost will increase at 6% per year for 11 years.
2. a) An engineering company in Bangladesh that owns several projects, decided to lease their capital land. They proposed that to the leasing company that it pays 20000 USD per yr. for 20 yrs. beginning 1 year from now, plus 10,000 USD 06 years from now & 15,000 USD 16 years from now. If the leasing company wants to pay the lease after 20 yrs., with a RoR of 20%, how much will they need to pay? 20
- b) Machine that have the following costs are under considered for welding process. Using an interest rate of 10% per year determine which alternative should be selected. 15

	Machine X	Machine Y
First cost (Tk)	-250,000	-430,000
M&O cost (Tk/yr.)	-60,000	-40,000
Salvage Value (Tk)	70,000	95,000
Life (Yr.)	3	6

3. a) The estimates shown are for a bridge under consideration for a river crossing in Voirab, Khulna. Use the B/C method at an interest rate of 6%. Per year to determine which bridge if either should be build. 25

	East Location	West Location
Initial cost (Tk)	11×10^6	27×10^6
M&O cost (Tk/yr.)	100,000	90,000
Benefits (Tk/yr.)	990,000	2,400,000
Dis-benefits (Tk/yr.)	120,000	100,000
Life (Yr.)	∞	∞

- b) What is procurement? What are the procurement ethics? Explain briefly. 10

4. a) Briefly explain the steps of public procurement project. 15
 b) Consider, Department of Architecture KUET, needed to be renovated and related objects are needed to be procured through a public procurement. If 20 laptops, 10 printers, 1 server, 5 routers, 100 chairs, 100 tables, 10 white boards, 5 executive chair and tables are needed, determine how many ways the objects can be procured in lot/packages? 15
 c) Why the official cost estimation is important for any public project? 05

Section-B

5. a) What is meant by PERT and CPM? 10
 b) Why is CPM important for a project scheduling? Explain with example. 15
 c) Explain the procedure of resource allocation while scheduling a project. 10
6. a) What are the errors in network diagram? Explain with figures. 12
 b) Define Float, Earliest starting time, Node, Activity and Dummy activity. 10
 c) Explain the procedure of preparing Gantt chart. How is it useful in controlling a project schedule? 13
7. a) What are the main resources involved in a project? 05
 b) For the following project, find out the optimum crashed duration and cost. Assume the indirect cost is 800tk/day. 30

Activity	Normal		Crash	
	Duration	Cost	Duration	Cost
	Weeks	(000, Tk)	Weeks	(000, Tk)
1-2	8	100	6	200
1-3	5	150	3	300
2-4	3	100	2	150
2-5	10	50	6	100
2-6	8	70	5	140
3-4	7	200	5	300
4-5	9	150	7	250
5-7	7	120	5	180
6-7	4	80	2	140

8. a) Explain the cost time curve of a project. 07
 b) Define optimistic time (t_o), pessimistic time (t_p), and most likely time (t_m). For an activity calculate the expected time (t_E) when, $t_o = 4$, $t_m = 7$ and $t_p = 10$ days. Also find the variance and standard deviation for the activity. 15
 c) For the following information, draw a network diagram and find the expected completion time. 13

Activity	Immediate Predecessor	Time (Month)
A	-	12
B	-	12
C	A, B	15
D	B	22
E	B	10
F	C, D, E	12
G	E	3

Khulna University of Engineering & Technology

Department of Architecture

B. Arch 5th Year 1st Term Regular Examination, 2023

Course No: HUM-5125

Course Title: Principle of Accounting

Full Marks: 210

Time: 03 Hours

- N.B. i) Answer any three questions from each section in separate script
ii) Figures in the right margin indicate full marks



Section-A

1. a) Define transaction. Write down the characteristics of transaction. 10
b) Identify and describe the steps in the accounting cycle. 15
c) Show the classification of account. State the roles of debit and credit of accounts. 10

2. Mr. Aman decides to open a computer programming service which name 'Desire IT' on January 1, 2024. During the first month of operations, the following transactions occurred:

2024 January-1	Mr. Aman invests Tk 1,00,000 cash and Equipment Tk 50,000 in the business.
2024 January-2	Purchases computer equipment for Tk 20,000 cash
2024 January-3	Purchases for Tk 16,000 from paper supply company computer paper and other supplies on account.
2024 January-5	Received a bill for Tk 2500 from customers for programming services it has provided.
2024 January-6	Received a bill for Tk 2500 from the 'Daily News' for advertising on account.
2024 January-10	Provides Tk 35,000 of programming services for customer, cash of Tk 15,000 is received from customers and the balance on Tk 20,000 is billed on account.
2024 January-15	Expenses paid in cash for store rent Tk 6000 salaries of employees tk 9000 and utilities Tk 2000
2024 January-17	Pays Tk 2500 'Daily News' advertising bill cash transaction January 6.
2024 January-20	The sum of Tk 20,000 in cash is received from customers who have previously been billed for service in transaction 10.
2024 January-25	Paid Tk 10,000 cash from the business for salary.

Instructions: a) Prepare a tabular summary of the transactions.

15

b) Prepare journal

20

3. a) Show the differences between journal and ledger. 10
 b) From the following transactions you are required to prepare a ledger accounts: 25

2023 July-1	Mr Rafin invested Tk 1,50,000 of cash in the business.
2023 July-2	Purchased Tk 50,000 of office equipment paying cash Tk 20,000 and the balance on account.
2023 July-3	Purchase office supplies of Tk 7500 in cash
2023 July-4	Service provided for cash Tk 26,000 and on account Tk 37,000
2023 July-5	Cash paid to accounts payable transaction January-2

Instructions: Prepare necessary ledger accounts. Mr. Rafin uses the chart of accounts cash 101, capital 301, Equipment 105, Accounts payable 305, Supplies 110, Accounts receivable 120, Service revenue 310.

4. a) Define trial balance. Describe the limitations of trial balance. 10
 b) From the following ledger balances of Sakib Enterprise prepare a trial balance as on 25

31st December, 2023:

Cash	7125 Taka
Accounts receivable	11,500
Opening stock	96,500
Notes receivable	20,000
Supplies	1625
Prepaid insurance	3000
Furniture	83,000
Accumulated depreciation furniture	6000
Accounts payable	1,17,500
Unearned sales revenue	5000
Notes payable	31,500
Capital	64,750
Withdrawn	1,35,250
Sales	4,20,000
Sales discount	3500
Sales return	5000
Interest revenue	1500
Purchase	2,28,000
Purchase discount	7500
Purchase return	3000
Transportation in	13,000
Wages expense	24,500
Rent expense	21,000
Interest expense	3250

Section-B

5. a) Define cost accounting. Distinguish between financial accounting and cost accounting. 10
 b) Cost accounting is an essential tool of management explain. 10
 c) Show the classification of cost. 05
 d) Apron is confused about the differences among variable costs, fixed costs and mixed costs. Explain the differences to Apron with examples. 10

6. From the following information of ABC manufacturing company. You are required to prepare a statement of cost or cost sheet as on 31st March 2024:

35

Sales for the period	27500 tk
Inventories as on 01.03.2024:	
Materials	300 tk
Work-in-process	400 tk
Finished goods	800 tk
Raw materials purchased	11,000 tk
Direct labor	6500 tk
Chargeable expenses	1000 tk
Inventories as on 31.03.2024:	
Materials	400 tk
Work-in-process	600 tk
Finished goods	700 tk



Other expenses:

Factory overhead: @50% of direct labor

Administrative overhead: 10% of works cost

Selling overhead: 5% of administrative expenses

7. a) Define cost behavior analysis. Why is cost behavior analysis important to management? 10
- b) Zion seating, a manufacturer of chairs, had the following data for 2020: 25

Sales	2,400 units
Sales price	\$40 per unit
Variable costs	\$15 per unit
Fixed costs	\$ 19,500

Required: Compute

- Break-even point in units
 - Break-even point in sales
 - Margin of safety
 - Contribution margin ratio
 - If the company wishes to increase its contribution margin by 40% in 2021, by how much will it need to increase sales if all other factors remain constant?
8. a) Your classmate, Fahim, is confused about sunk costs. Explain Fahim the meaning of sunk costs and their relevance to a decision to retain or replace equipment. 10
- b) Waltson Company produces kitchen cabinets for homebuilders across the Western United States. The cost of producing 5000 cabinets is as follows- 15

Materials	\$500,000
Labor	250,000
Variable overhead	100,000

Fixed overhead	400,000
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Total=12,50,000

Waltson also incurs selling expenses of \$20 per cabinet. Wellington Corp, has offered Waltson \$165 per cabinet for a special order of 1000 cabinets. The cabinets would be sold to homebuilders in the Eastern United States and thus would not conflict with Waltson current sales. Selling expenses per cabinet would be only \$5 per cabinet. Waltson has available capacity to do the work. Should Waltson accept the special order? Why or why not?

- c) Hava Racquets manufactures tennis racquets in four different models. For the year, the Soft Touch Line had a net loss of ¥40,000 from sales of ¥250,000 variable costs of ¥180,000 and fixed costs ¥110,000. If the Soft Touch Line is eliminated, ¥30,000 of fixed costs will remain. Prepare an analysis showing whether the Soft Touch line should be eliminated. 10