Khulna University of Engineering & Technology

Department of Architecture

B. Arch 3rd Year 2nd Term Regular Examination, 2022

Course No: Arch 3231   Course Title: Contemporary Architecture

Full Marks: 210   Time: 03 Hours

Section-A

1. a) What was the main driving force behind the fall of modern architecture?   05
    b) Do you consent to the postulation that the pioneering modernists like Le Corbusier and   30
    Louis I. Kahn are the epitomes of T.S. Eliot's 'poet'? Rationalize your answer.

2. a) How is the origin of contemporary architecture similar to the origin of contemporary   05
    music?
    b) The works of which contemporary architect embody a more humanely grounded   30
    philosophy rather than a heretic one typical of the other contemporary architects?
    Elucidate.

3. a) The presence of which factor has been claimed by Kahn as the beginning of   05
    architecture? Explain.
    b) Reflecting upon the works of Tadao Ando and B. V. Doshi what other traits of   30
    contemporary architecture would you suggest other than the conventionally accepted
    visual ones? Elucidate.

4. a) What is De-constructivism?   05
    b) Rationalize the statement that the works of Daniel Libeskind thoughtfully deconstruct   30
    the historical essence of our existence.

Section-B

5. a) Discuss contemporary architecture with reference to the works of Architect Diebedo   20
    Francis Kere.
    b) How would you define 'Landmark' in architecture? Discuss the term 'Identity in   15
    Architecture'.

6. a) Discuss two works of Geoffrey Bawa that reflect both tropical modernism and   20
    contemporary approach of architecture in Sri Lanka.
    b) 'Pluralism in Architecture'-is the ideology to ensure multi-culturalism. - Illustrate   15
    the statement briefly.

7. a) Discuss the ideology "Critical Regionalism" under any three points of Kenneth   15
    Frampton.
    b) "'Dhaka Art Institute' is the finest example of contemporary architecture in   20
    Bangladesh"- discuss the statement with illustrations.

8. a) Write short notes on (any two):   7.5x2
        i)   Regional Sensitivity in Architecture: The Early Islamic period.   =15
        ii)   Political Acculturalization vs Bengali Revivalism: Post-colonial
              Period.
        iii) Rural Vernacular: The Eternal Resource.
    b) Mention two projects that represent the contemporary architecture of Bangladesh,   20
    give necessary illustrations.

Khulna University of Engineering & Technology

Department of Architecture

B. Arch 3rd Year 2nd Term Regular Examination, 2022

Course No: CE 3223   Course Title: Plumbing

Full Marks: 210   Time: 03 Hours

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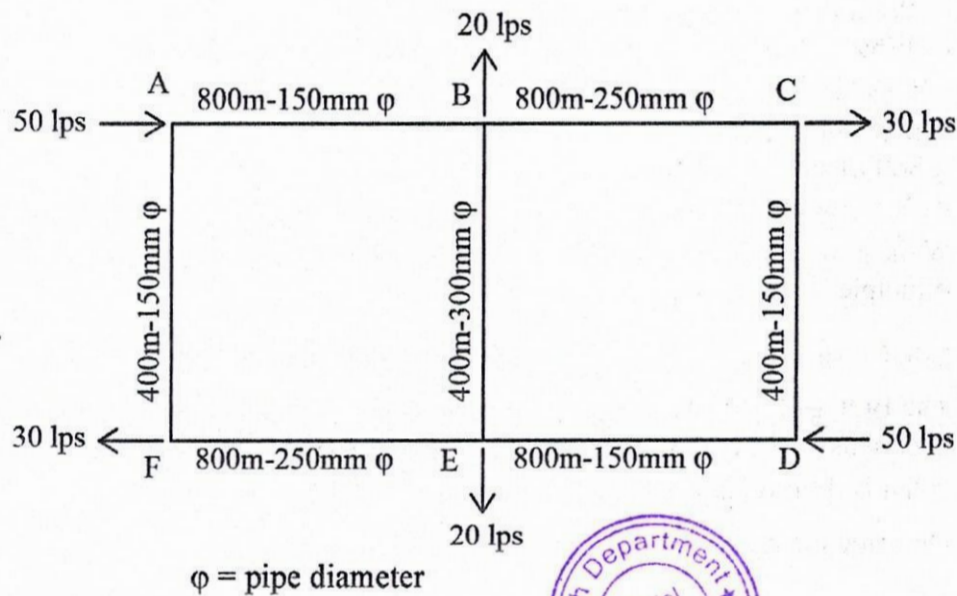   ii) Figures in the right margin indicate full marks

Section-A

1. a) Define Small-bore sewerage (SBS) system. What are the elements of SBS systems – show graphically.   10

   b) What are the types of sewerage collection system – describe briefly.   15

   c) What are the factors that influence the quantity of waste water estimation?   10

2. a) An 18inch sewer with n=0.013 is laid on a slope of 0.0125.   15
      i) What is the capacity when flowing half full?
      ii) What will be the velocity when the depth of flow is 4.5 inch?
      (Hints: Q=Av)

   b) Write short notes on: 08
      i) Self-cleansing velocity
      ii) Non-scouring velocity

   c) What is trickling filter? Draw a typical trickling filter and explain its working principle.   12

3. a) What is BOD? Explain BOD remaining as a function of time   10

   b) The BOD_5 of a waste water is determined as 150 mg/L at 20°C. The K value is known as 0.23 per day. What would be the BOD_8 if the test were run at 15°C?   10

   c) What is dilution factor? Explain the term - NBOD with reaction.   08

   d) Describe the hydraulic design of sewers.   07

4. Design a waste stabilization pond system to treat waste water from a low-income settlement with a population of 25,000 at Mohammadpur, Dhaka. The average waste water flow is about 110 liters per person per day and the BOD contribution is 30gm/P/day. The mean temperature of the coolest month is 20°C and during irrigation season, 26°C. It is desired that the final effluent be used for crop irrigation. Assume faecal coliform concentration in raw waste-water to be 1×10^8 per 100mL and permissible Fe≤1000/100 mL volumetric loading rate at 20°C is 300gm/m^3/day and BOD removal at 20°C is 60% BOD. Surface loading rate at 20°C is 253kg/ha/day and at 26°C is 369 kg/ha/day.   35

Section-B

5. a) What are the elements of water supply? Briefly explain them with neat sketch.   13

   b) What are the planning and design consideration for a water supply system?   12

   c) Explain the hydrological cycle with neat sketches.   10

6. a) Differentiate with Perennial & Ephimeral source of surface water.   07

   b) What a type of water transmission system do you suggest for hilly region as Sajek valley? Explain with neat sketch.   15

c) A new construction project was proposed for residential purpose in Bashundhara city. The land area consists of blocks of plots for residential building. What type of distribution network & supply tank is perfect if most of the buildings are more than 10 stories? Explain.   13

7. a) Draw a typical daily water demand curve.   05

b) Calculate the peak water demand of a city corporation having a present population of 10,00,000 for a design period of 50 years. The average per capita water consumption is 120 lcpd, with a peak factor 1.5. The population growth rate is 1.47% & the loss & wastage is 25%.   10

c) Differentiate between wet fire sprinkler system & dry pipe systems.   05

d) For a sprinkler system to work 6.9 bar of pressure is required. For a specific building the initial pressure in the pipe was kept 7.2 bar after the friction loss. The initial friction loss was 0.020 bar. After some years of use the pipe got clogged due to salinity, the clog reduced 2cm thickness of the pipe. If the thickness of the pipe is 1.5cm & the discharge of the water is 1.2m^3/min. Find out whether the system will still work or not?   15

8. a) Calculate the flow in each of the pipe in the following looped pipe network by Hardy cross method, when the roughness coefficient is 120.   30

20 lps

A   800m-150mm φ   B   800m-250mm φ   C

50 lps →

→ 30 lps

400m-150mm φ   400m-300mm φ   400m-150mm φ

30 lps ←

← 50 lps

F   800m-250mm φ   E   800m-150mm φ   D

20 lps

φ = pipe diameter

b) Why storage reservoirs are necessary?   05

Khulna University of Engineering & Technology

Department of Architecture

B. Arch 3rd Year 2nd Term Regular Examination, 2022

Course No: Arch 3221　　　　　　　　Course Title: Urban Design

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) Briefly discuss the concept of "Transit Oriented Development (TOD)". 　10
   b) Develop a Mass Rapid Transit scheme for Khulna to transform the city from an automobile based metropolis to a transit city. Use necessary details. 　25

2. a) Define 'Historic Urban Landscape (HUL)' approach. How can culture and heritage help cities in an era of globalization? 　15
   b) Analyze the influence of HUL Toolkit for the management of urban heritage in rapidly growing cities like Khulna. 　20

3. a) Define 'Urban Form and Space'? 　05
   b) Explain the concept of "New Urbanism" and evaluate the main components of this concept. 　10
   c) "Giving people many choices for living an urban lifestyle in sustainable, convenient, and enjoyable places, while providing the solutions to peak oil and climate change"- justify this statement by the principles of New Urbanism. 　20

4. a) Elaborate the concept of "The Garden City". Identify the issues addressed by this theme. 　10
   b) Write short notes on: (Any two) 　10
      i. Place Making & Waterfront Development
      ii. Garden City Movement
      iii. The Figure-Ground Diagram of Le Corbusier.
   c) What is Transect Planning? Illustrate a rough geographic cross-section of Khulna city and identify each transitional neighborhood. 　15

Section-B

5. a) Illustrate the aspects of temporal dimension of urban design. 　10
   b) Prepare a design proposal for a "socially just" urban park in the context of a newly developed multi-cultural residential area. 　25

6. a) Why is it vital to analyze the visual aspects before designing an urban area? 　15
   b) Do you think street frontage plays a significant role in urban design? Justify your statement with examples. 　20

7. a) What are the elements that construct a city's image? What approaches should be considered when developing an imaging experience for users? 　5+20=25
   b) Why is morphological analysis important in urban design? 　10

8. a) Briefly describe the methods and techniques of urban design as RIBA suggested. 　25
   b) Write short note on "Urban Tissue". 　10

Khulna University of Engineering & Technology

Department of Architecture

B. Arch 3rd Year 2nd Term Regular Examination, 2022

Course No: CE 3225   Course Title: Structure IV

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
      iii) Graphs (2 nos.) for question 2(b)

Section-A

1. Design the shear wall for shear and moment for the given plan and   35
    elevation shown in the figure. The structure is subjected to unfactored
    wind load. Material property f'c= 4 ksi and fy= 60 ksi.
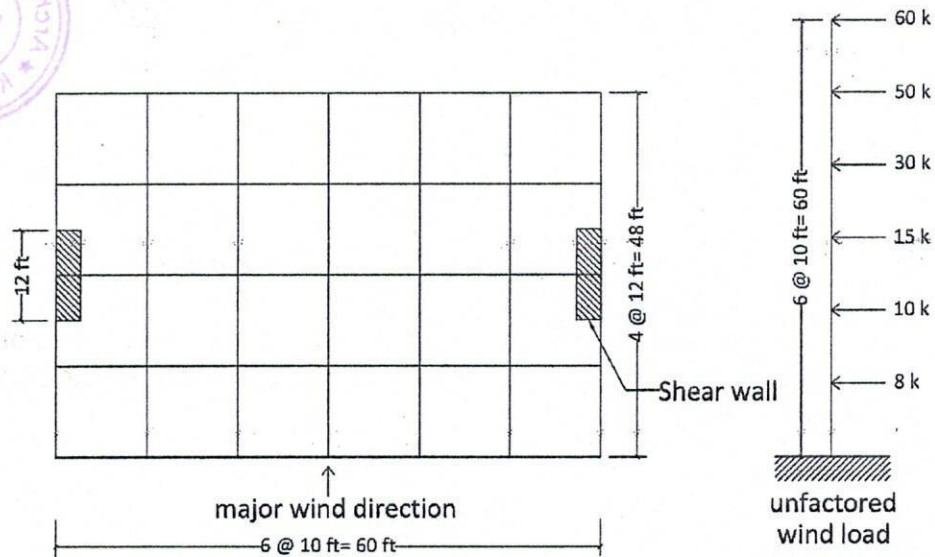

Figure 1

2. a) What is Earthquake? Why Bangladesh is prone to a major earthquake   15
        within a decade?

    b) Shown in the figure, there is a seismogram from a major earthquake. 15
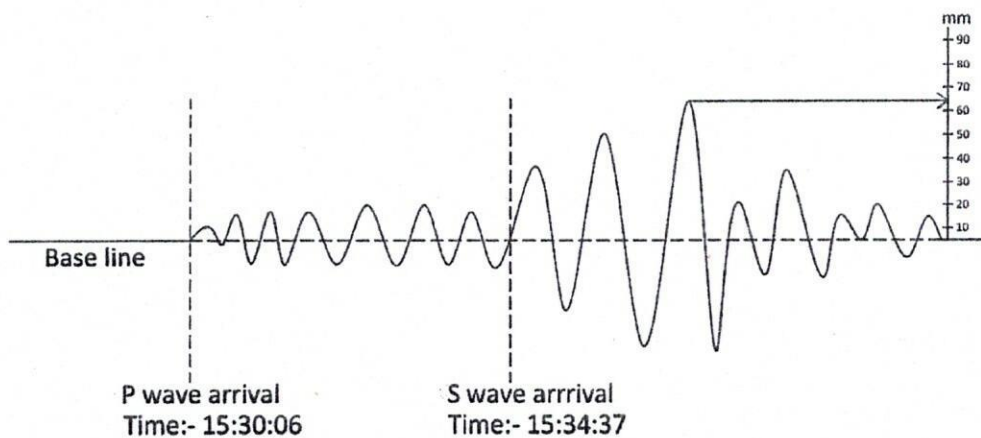   Determine the Richter magnitude of the earthquake.

Figure 2(b)

    c) Briefly explain, why earthquake of same magnitude vary in intensity at   05
        different distance?

3. a) What is diagrid structural system? What are the benefits of diagrid structural system over the frame structural system? **10**

   b) Show the effects of various types of loading on a diagrid structural system. **05**

   c) From the given plan determine the center of mass and center of stiffness of the floor. **20**
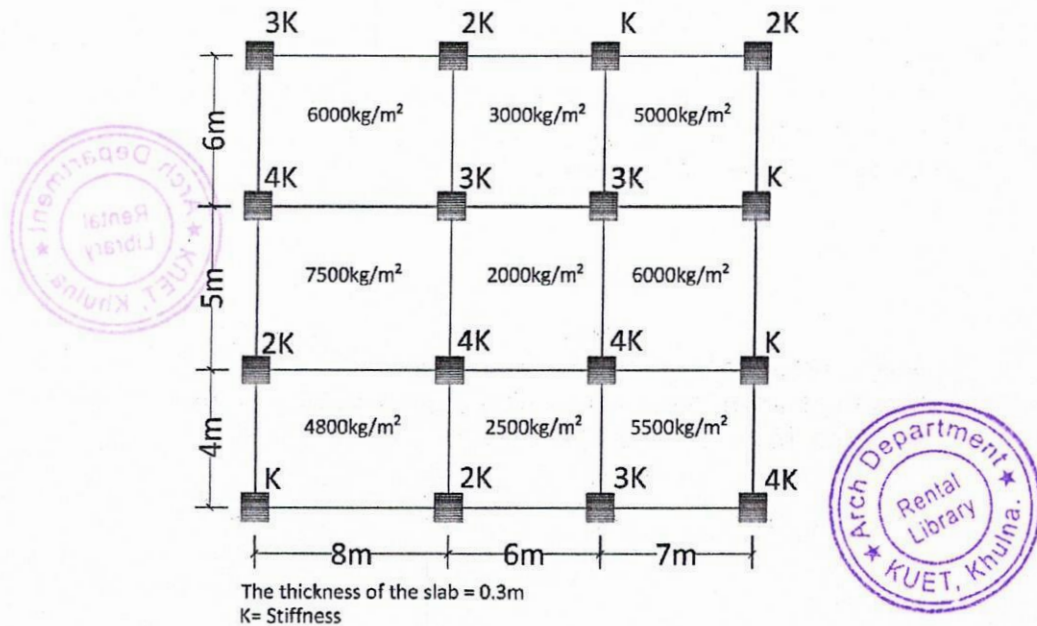

	3K	2K	K	2K
6m	6000kg/m²	3000kg/m²	5000kg/m²	
	4K	3K	3K	K
5m	7500kg/m²	2000kg/m²	6000kg/m²	
	2K	4K	4K	K
4m	4800kg/m²	2500kg/m²	5500kg/m²	
	K	2K	3K	4K
	⊢——8m——	——6m——	——7m——	

The thickness of the slab = 0.3m
K= Stiffness

Figure 3(c)

4. a) Draw a neat sketch of the seismic zones of Bangladesh. **10**

   b) How can you make a structure earthquake proof? **10**

   c) Determine the reinforcement amount for the shear resisting wall of thickness 8 inch and height of 10 ft which need to resist shear of 250k in the length of 10 ft. **15**

Section-B

5. Design an interior panel (panel B) for a flat plate floor system as shown in the following figure. Assume a service live load equal to 88 psf, a service dead load equal to 114 psf (including self-weight), fy = 60,000 psi, fc'= 3000 psi, normal-weight concrete, and column heights of 12 ft. Given that percentage of interior negative design moments to be resisted by middle strip is 25% and percentages of positive design moment to be resisted by column strip is 60%. Show the reinforcement detailing for long direction only. **35**

edge beam 12 in. wide and projects vertically 8 in. below slab

5 @ 16ft = 80 ft

A   B

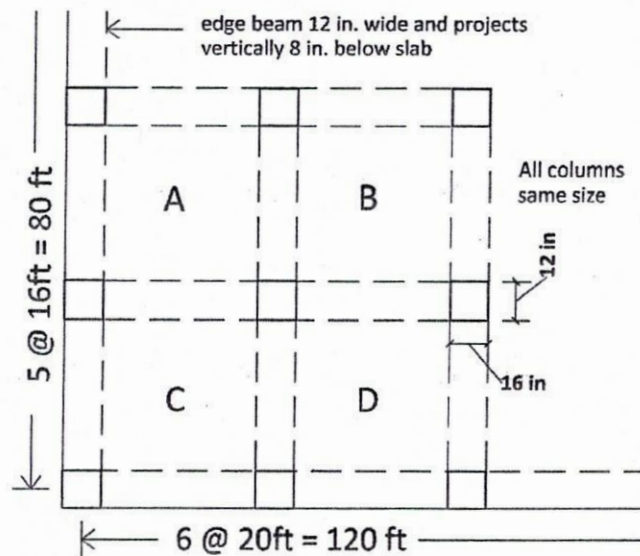All columns same size

12 in

C   D

16 in

6 @ 20ft = 120 ft

Figure 5

6. a) Differentiate between flat plate and flat slab with appropriate sketch. Write down the advantages and disadvantages of flat plate over conventional RCC slab.   15

    b) Describe the Shear Resistance of slabs with diagram.   10

    c) What is edge beam? Why is it used in building? Why strength reduction factor for shear failure is more conservative than flexure failure?   10

7. a) Mention the values of relative stiffness of slab with edge beam and without edge beam. Also show the distribution of lengths of column strip and middle strip in a two-way slab.   08

    b) Briefly describe the static moment in a slab.   07

    c) A column with the cross-section shown in figure is loaded concentrically. Calculate the allowable axial load. Given, 28-days compressive strength of concrete is 3.5 ksi and yield strength of the steel is 60,000 psi.   10
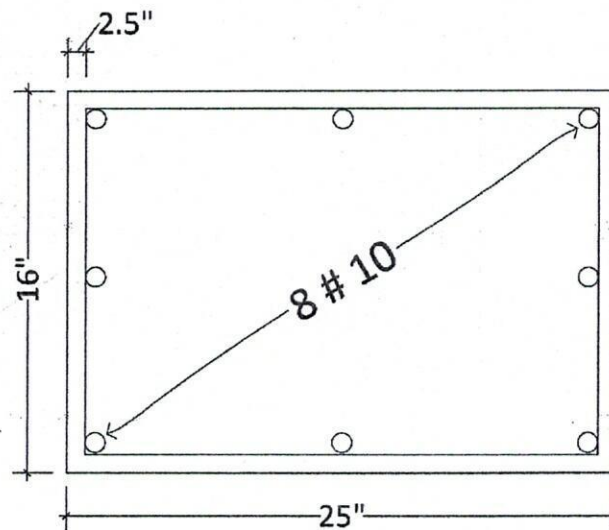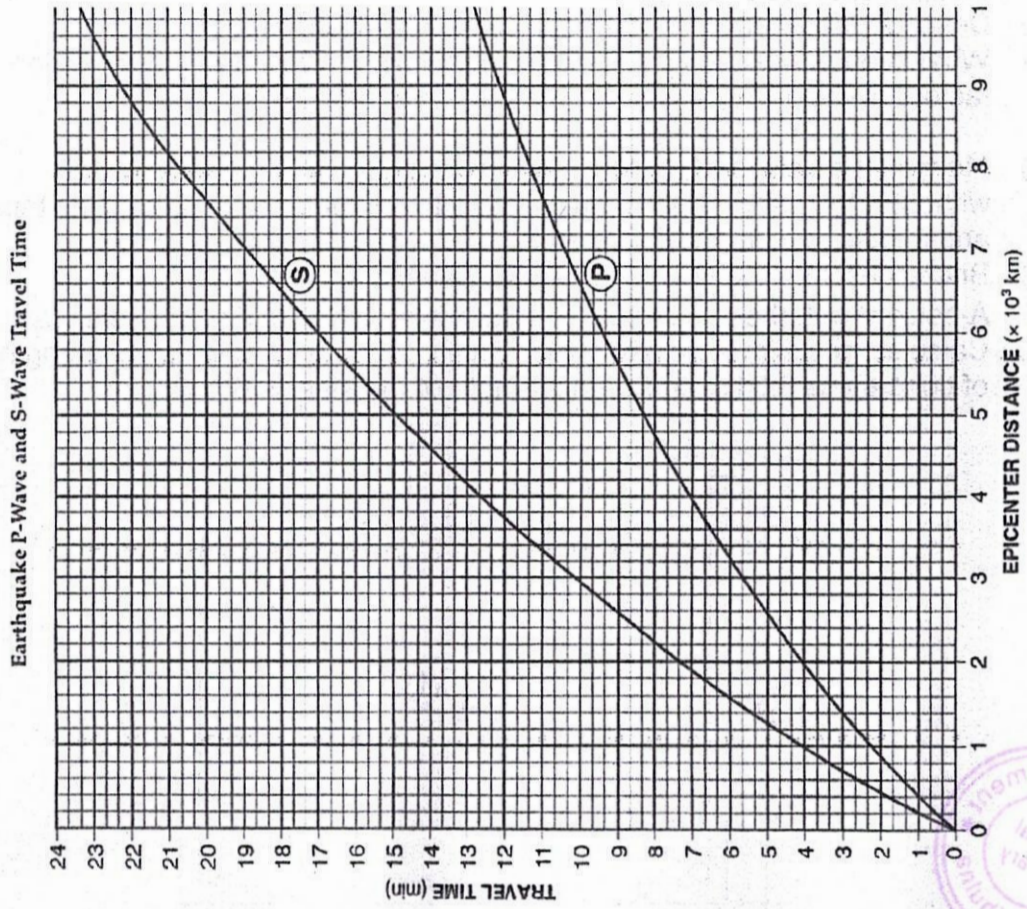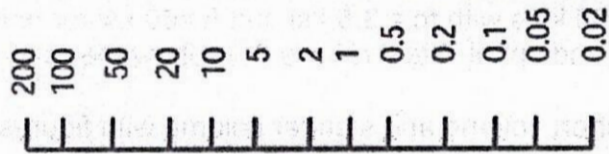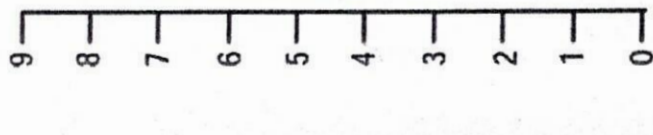

2.5"

16"

8 # 10

25"
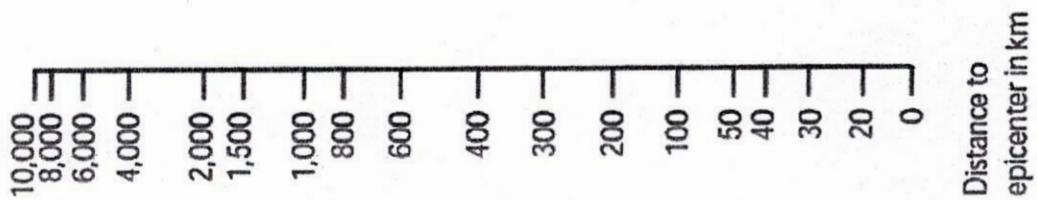
Figure 7(c)

    d) Explain the interaction diagram (WSD) for column with neat sketch.   10

8. a) Design a circular spiral reinforced column for a concentric allowable working load of 490 kips with fc'= 3.5 ksi and fy=60 ksi for both longitudinal steel and spiral. Steel ratio is 2%. Show the reinforcement detailing.   25

    b) Briefly describe short column and slender column with figures.   10

For Question 2(b)

Earthquake P-Wave and S-Wave Travel Time

TRAVEL TIME (min)

EPICENTER DISTANCE (× 10³ km)

Amplitude in mm

200
100
50
20
10
5
2
1
0.5
0.2
0.1
0.05
0.02

Richter Magnitude

9
8
7
6
5
4
3
2
1
0

Distance to epicenter in km

10,000
8,000
6,000
4,000
2,000
1,500
1,000
800
600
400
300
200
100
50
40
30
20
0

Khulna University of Engineering & Technology

Department of Architecture

B. Arch 3rd Year 2nd Term Regular Examination, 2022

Course No: URP 3225   Course Title: Site and Area Planning

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
       iii) Instructions for the candidate: Assume data where necessary

Section-A

1. Khulna, a bustling city in Bangladesh, grapples with consequences of haphazard neighborhood units that have emerged due to rapid urbanization and inadequate planning. Characterized by unplanned constructions, these areas often lack essential amenities and face challenges in infrastructure development.

    a) If you were to create a site plan for a neighborhood of Khulna City, what factors   15
        would you consider in the planning process? Discuss with examples.

    b) Imagine you have the power to alter the size dynamics of a neighborhood in   15
        Khulna. How would you balance intimacy and diversity to create the perfect
        sized community for fostering social connections, considering the size of the
        population and the extent of the geographic area?

    c) Mention any five principles of neighborhood planning considering the cultural   05
        situation of Khulna.

2. Suppose, you are in the team of designing a site in Khulna. Designing site layout is a critical task associated with ensuring several elements like Density, Allotment layout, Setbacks, Drainage control, Solar access etc.

    a) Prepare a shadow diagram at 12:00 PM for the building 'X' from the given   22
        information.

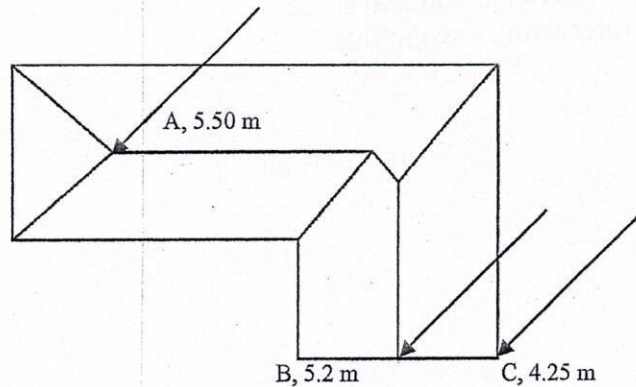| Chart 1			Chart 2	
Time	Angle (Azimuth)		Time	Length of shadow cast by 1m pole
9:00 AM	45°25''		9:00 AM	4.02 m
12:00 PM	5°55''		12:00 PM	2.85 m
3:00 PM	330°25''		3:00 PM	2.15 m

Figure: Plan of Building 'X'

    b) Mention some available technologies required for designing site layout.   05

    c) What are the documents you need to submit for the approval for your site plan?   08

3. a) Illustrate the street classification based on Private Housing Project Land   05
        Development Rule, 2012.

b) Which pattern of subdivision plan is more suitable than others in case of Bangladesh especially in the flat region as per your understanding and why? State your rationalities. 15

c) State any three comparative critical examples (good design and bad design) of subdivision planning and neighborhood design. 15

4. a) What is child-friendly neighborhood? Illustrate the components of it. 12

b) What are the strategies/actions you can take for a child-friendly neighborhood design? 15

c) Site plan locate objects and activities in space and time. – How and why? 08

Section-B

5. a) Describe the basic model of site planning history with necessary diagram. 10

b) Describe different layers of site planning with example. Narrate Kevin Lynch's Site Planning process. 15

c) "Site selection is necessary for SMART growth."- explain the statement with necessary example. 10

6. a) "Site planning involves several professions viz. Urban Planning, Architecture and Civil Engineering."- Briefly explain your judgement. 10

b) Suppose, you are working as an Architect in Khulna Development Authority (KDA). Which issues will you consider in your 'Site Inventory Checklist' for planning and designing of a bus terminal in Khulna city? 10

c) "Site planning is related to spirit of place, character of the place, nature of the project and behavioral studies."- Justify the statement with your rationalities by providing pertinent examples, if necessary. 15

7. a) Briefly describe the necessity of planning for parks, recreation of open space while designing a community. 15

b) What are the considerable factors to select the site for open space, parks and recreational area? 10

c) Why is it important to know the sun path diagram in Site planning? 10

8. Write short note on the followings: (any five) 35
   a) Landscaping
   b) Textural triangle
   c) Burgess zone model
   d) Hoyt sector model
   e) Classification of soil
   f) Active and Passive recreational space
   g) Factors in forecasting erosion rates