

SECTION – A

There are **FOUR** questions in this section. Answer any **THREE**.

1. Draw the shear force and bending moment diagrams for all the girders of the frame as shown in Figure 1. Use Portal method. (23 1/3)

2. Using approximate method of analysis for gravity loads, draw the bending moment diagrams for all the columns and girders and also the axial force diagrams of the columns for the frame shown in Figure 2. All the columns have same cross section and are uniform throughout the height. Use un-factored load. (23 1/3)

3. (a) Why is the strength reduction factor, Φ for columns is lower than those for flexure? (3)
 (b) Determine the design axial load (factored) for the column marked "C1" in the grid shown in Figure 3 at the ground floor level of a 5 storied building. Slab thickness is 6 inch, floor finish load is 25 psf and live load is 60 psf on all the floors. Disregard self-weight of the column and the beams. (5 1/3)
 (c) Design a square tied column to support an axial dead load of 500 kips and a live load of 300 kips using $f'_c = 4$ ksi and $f_y = 60$ ksi. Assume a proper steel ratio within limits and design the necessary ties also. (15)

4. (a) Explain different types of failures that may occur in shear walls with proper illustrations. (6 1/3)
 (b) A three storied shear wall is subjected to lateral forces as shown in Figure 4. The wall is 15 feet long and 12" thick. Design the shear wall for both moment and shear. All the relevant formulae are provided in Annexure. Use $f'_c = 3$ ksi and $f_y = 60$ ksi. (17)

SECTION – B

There are **FOUR** questions in this section. Answer any **THREE**.

Assume any reasonable value of missing data.

5. (a) Write down the differences between meridional thrust and hoop stress in a dome. (4 1/2)
 (b) "Vierendeel Truss does not fit the strict definition of a truss" – explain. (6 1/3)
 (c) Write down the advantages and disadvantages of 'Concrete Translation Shells'. (4 1/2)
 (d) Describe the factors contributing to loss in prestress. (8)

CE 467 (CE 425)

6. (a) A Vierendeel Steel Truss (AB) is used to support corner columns of a rectangular building of 200 ft × 150 ft, 5 stories high (Figure - 5(a)). The truss consists of 10 panels 15 ft × 10 ft each, with the chords at the level of 1st and 2nd floors (Figure-5(b)). Determine shear force and bending moment at panel 2, 4 and 7. (17)

Given that,

The total factored loads (dead load + live load) per floor is = 220 psf

$f_y = 60$ ksi

- (b) Write down the differences between Prestressed and Reinforced concrete. (6 1/3)
7. (a) Derive the equation of hoop stress in a dome due to a concentrated load at the crown. (19)
- (b) Write down the differences between "vault" and "barrels shell". (4 1/3)
8. (a) Why high strength concrete and steel are used in prestressed concrete? (3 1/3)
- (b) A posttensioned bonded concrete rectangular beam has a prestress of 1750 KN in the steel immediately after prestressing, which eventually reduces to 1600 KN due to losses. The beam carries a uniformly distributed live load of 5 KN/m and three point live load of 50 KN in addition to its own weight of 5.5 KN/m (Figure-6). Compute the extreme fibre stresses in the concrete (using gross section) at a location 7.0 m from left support, (i) under the initial condition with full prestress and no live load and (ii) under the final condition, after the losses have taken place and with full live load. (14)
- (c) Differentiate between: (6)
- (i) Partial and Full prestressing
 - (ii) Pretensioning and Posttensioning
 - (iii) Bonded and Unbonded Tendons
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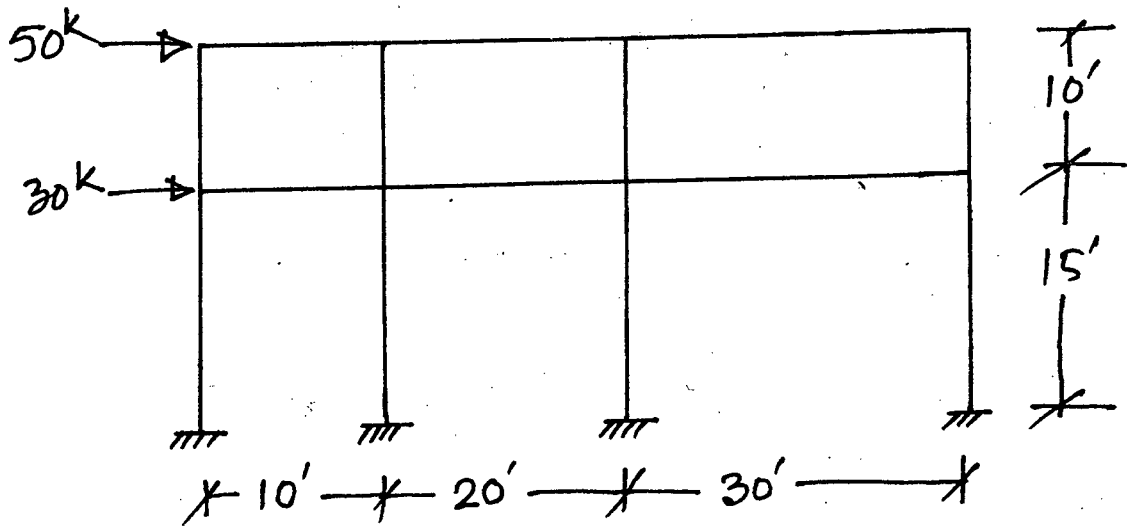
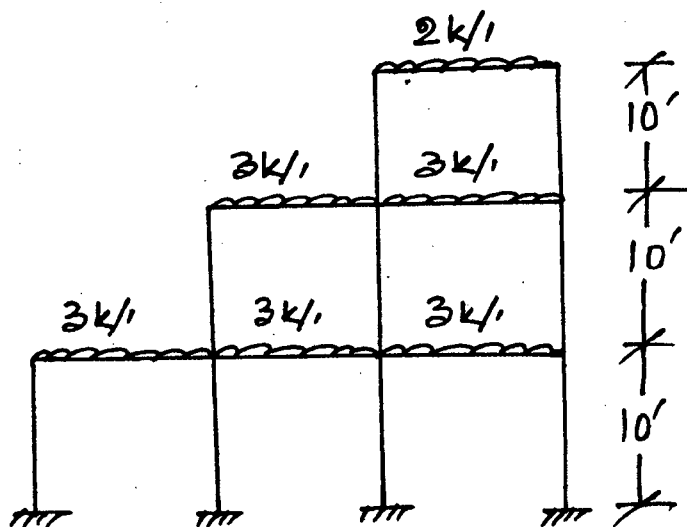


Figure 1



3 @ 12' = 36'

Figure 2

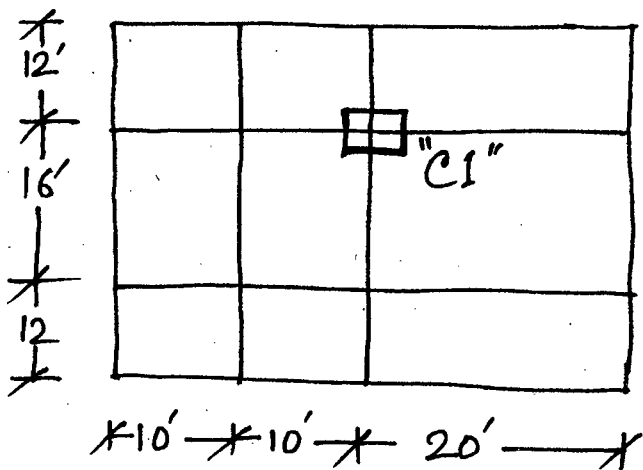


Figure 3

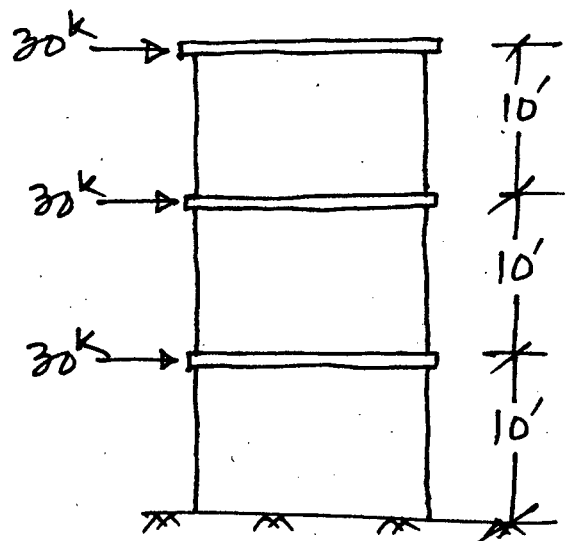
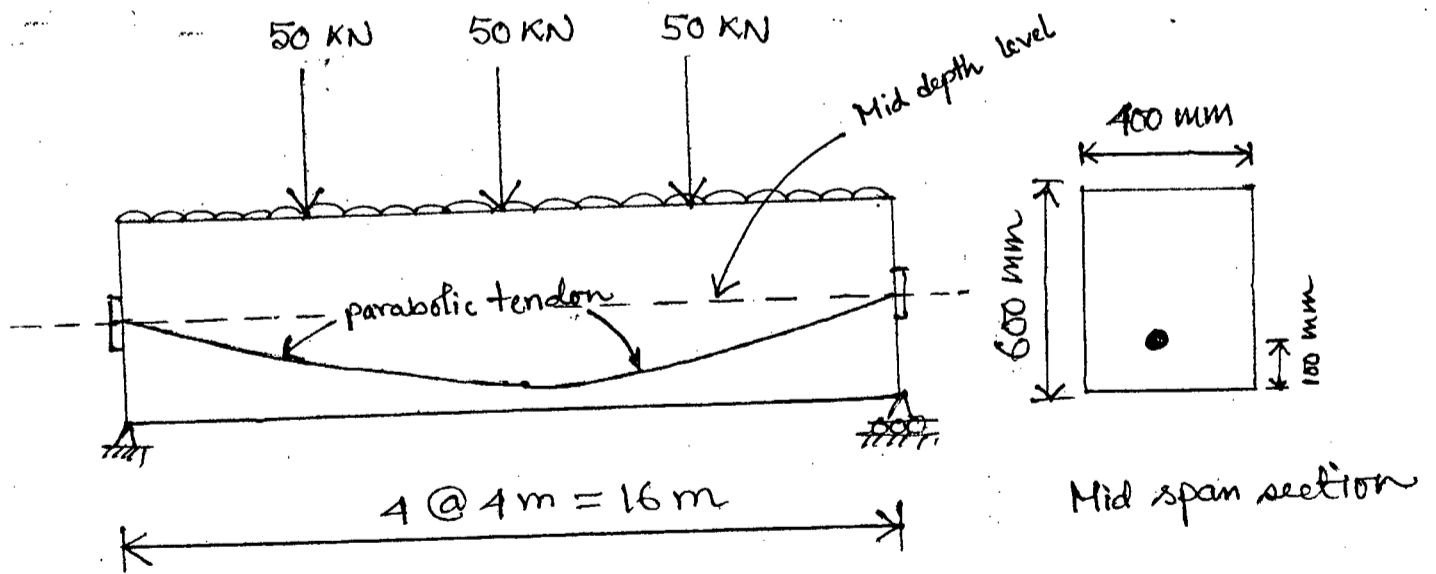
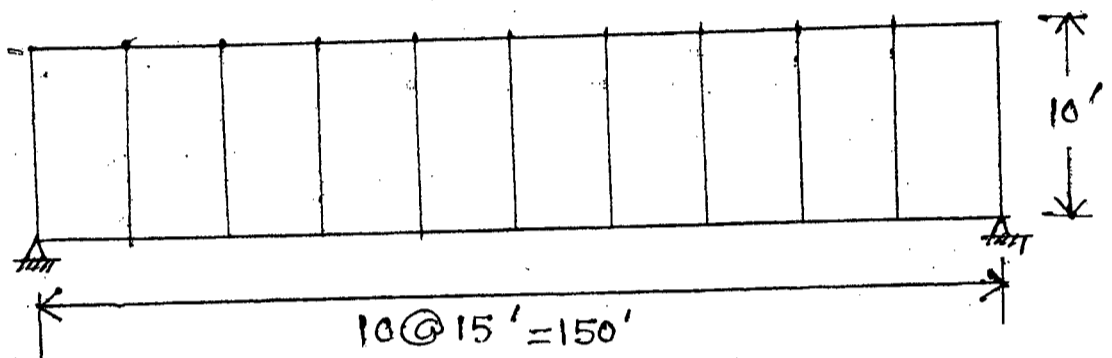
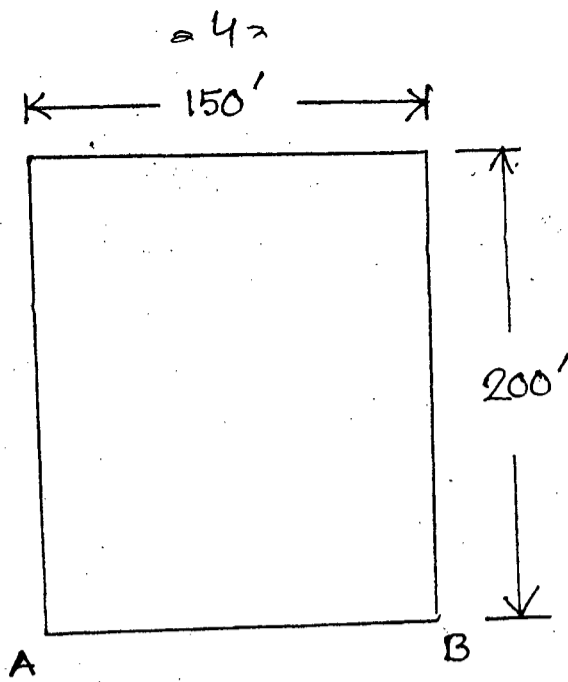


Figure 4



ANNEXURE 1

$$f_y = 60 \text{ ksi}, \quad f'_c = 3 \text{ ksi}, \quad \phi = 0.85$$

$$V_u = \phi V_n \leq 10\phi\sqrt{f'_c}dh, \quad d = 0.8 l_w$$

$$V_c = 2\sqrt{f'_c}dh$$

$$\frac{A_{vh}}{S_2} \geq \frac{V_u - \phi V_c}{\phi f_y d}, \quad S_2 \leq \frac{l_w}{5}, \quad 3h \text{ or } 18 \text{ in}$$

$$\frac{A_{vw}}{S_1} \geq \left[0.0025 + 0.5 \left(2.5 - \frac{h_w}{l_w} \right) \left(\frac{A_{vh}}{S_2 h} - 0.0025 \right) \right] h$$

$$S_1 \leq \frac{l_w}{3}, \quad 3h \text{ or } 18 \text{ in}$$

$$\frac{A_{vh}}{S_2} (\text{min}) = 0.0025h$$

$$\frac{A_{vw}}{S_1} (\text{min}) = 0.0025h$$

$$\phi M_n = \phi \left[0.5 A_{st} f_y l_w \left(1 - \frac{z}{l_w} \right) \right]$$

$$\frac{z}{l_w} = \left(\frac{1}{2 + \frac{0.85\beta_1 l_w h f'_c}{A_{st} f_y}} \right)$$

SECTION – A

There are **FOUR** questions in this section. Answer **Q. No. 1** and any **TWO** from the rest.

1. Write short notes on: (3×8=24)
- (a) Human Settlements
 - (b) Modern House
 - (c) Housing Problem
2. (a) Explain the concept of dwelling. (5)
- (b) Give reasons for considering Christian Norberg-Scholz's collective and private modes of dwelling in Dhaka. (9)
- (c) Discuss with examples the meaning of housing from the socio-cultural perspective. (9)
3. (a) Explain the housing implication of the Modernization theory. (5)
- (b) Elaborate Modernity's 'normative living programme'. (9)
- (c) Explain briefly 'housing as a system of signs'. (9)
4. (a) Explain slum. (5)
- (b) Elaborate briefly the main features of urbanization in developing countries. (9)
- (c) Explain the types of homelessness in cities in Bangladesh. (9)

SECTION – B

There are **FOUR** questions in this section. Answer **Q. No. 5** and any **TWO** from the rest.

5. Write short notes on: (3×8=24)
- (a) Adequate Shelter
 - (b) Misconceptions of Housing
 - (c) Modes of Housing Provision

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6. (a) Explain Housing Policy. (5)
(b) Compare the objectives of providing and supporting housing paradigms. (9)
(c) Explain the backgrounds, objectives and rationals of Global Shelter Strategy. (9)
7. (a) Explain Sustainable Shelter. (5)
(b) What are the ways in which Habitat Agenda Pursues Sustainable Shelter? (9)
(c) Discuss the ends, means and ways of housing. (9)
8. (a) Explain sustainable housing. (5)
(b) How does sustainability differ in the formal and informal sectors of housing? (9)
(c) What past limitations led to consider housing through a multi-dimensional sustainable perspective? (9)
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L-4/T-2/ARCH

Date : 24/05/2014

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-2 B. Arch. Examinations 2011-2012

Sub : ARCH 497 (Health Facilities Planning and Design)

Full Marks : 140

Time : 3 Hours

The figures in the margin indicate full marks.

USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – A

There are **FOUR** questions in this section. Answer **Q. No. 1** and any **TWO** from the rest.

1. (a) Sketch the basic functional groups in an intermediate general hospital. (4)
(b) Show the layering of zones in the hospital in relation to public access and the resultant traffic pattern. (6+6=12)
(c) Name the basic departments of an intermediate general hospital. (10)
2. (a) What is the difference in the philosophy of service of Accident and Emergency department and the OPD? (8)
(b) Sketch the basic functional areas and zoning in an Accident and Emergency Department and the patient flow. (14)
3. Discuss the principles of planning and design of a contemporary Imaging Department. (22)
4. (a) How can hospital hygiene be achieved? (22)
(b) How is environmental hygiene control exercised in an Operating Theatre Suite?

SECTION – B

There are **FOUR** questions in this section. Answer any **THREE**.

5. The scientific discoveries changed the morphology of hospital design in the 18c and 19c. Explain with reference to the prior conditions that prevailed. Give examples. (23 1/3)
 6. (a) What role is played by the hospital user group, planning team and the design team in the system, and the standard process that is generally followed in developed countries? (11)
(b) What activities are generally performed in the different stages of planning and design of the above system? (12 1/3)
 7. (a) What is meant by 'hospital utilization'? What are the two main classifications of the "indices of measurement" of hospital utilization? Also define the terms used in it. (11 1/3)
(b) Mention the factors influencing hospital utilization and discuss any two factors. (12)
 8. Discuss the general principles of hospital organization. (23 1/3)
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Sub : **ARCH 463** (Survey Technique and Analytical Methods)

Full Marks : 140

Time : 3 Hours

The figures in the margin indicate full marks.

USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – AThere are **FIVE** questions in this section. Answer **Q. No. 1** and any **THREE** from the rest.

1. Explain the differences between the practical problem and the research problem with example. (10)
2. (a) What is a variable? Define dependent and independent variables. (5)
(b) Write down the unit of analysis, the dependent, and independent variables of the following research questions and hypotheses. (5×3=15)
 - ☐ Are older people more afraid of crime than younger people?
 - ☐ The higher the number of public lighting in a neighbourhood the lower the crime rate in the neighbourhood.
 - ☐ The greater the growth of air traffic passengers at a city's airport the more the economic growth.
3. Why do we do 'sampling? What is the difference between parameter and estimate? Explain the term 'population' of the sampling process. What is stratified sampling? In what circumstances should one use cluster sampling? (4×5=20)
4. Elaborately discuss the mistake/s of the following questions of a questionnaire and make corrections as required. Use correct terms when discussing the questions. (10×2=20)
 - ☐ What do you think about the functionality and aesthetics of the Art Museum?
 - ☐ What was your age when you first drew an isometric drawing?
5. Define and discuss the following: (20)
 - (a) Focus Group Discussion (FGD)
 - (b) Cognitive mapping
 - (c) Place and individual centered mapping
 - (d) Trace measure

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SECTION – B

There are **FOUR** questions in this section. Answer **Q. No. 6** and any **TWO** from the rest.

6. Write short notes: (4×5=20)

- (a) Characteristics of closed traverse
- (b) Benchmark
- (c) Reciprocal levelling
- (d) Contours

7. (a) Define Tie lines, check lines and reconnaissance. (3×3=9)

(b) Describe with illustration, the method of chaining along sloping ground. (10)

(c) What are the important points considered while selecting a particular station for chain survey? (6)

8. (a) Describe different types of bearing. (4)

(b) Derive reduced bearing when whole circle bearings are (6)

- (i) $115^{\circ}25'$ (ii) 235° (iii) 327°

(c) In a closed traverse ABCD the following bearings are observed (15)

- (i) Check if there is any error due to local attraction or closing error.
- (ii) Correct the bearings of the line BC and CD if considerable error is found.

Lines	Forward bearing	Backward bearing
AB	$50^{\circ}15'$	$230^{\circ}15'$
BC	$142^{\circ}40'$	$323^{\circ}55'$
CD	$172^{\circ}30'$	$350^{\circ}10'$
DA	$290^{\circ}10'$	$110^{\circ}15'$

9. (a) Describe with illustration, Radiation method of plane table surveying. Discuss error's advantages and disadvantages of plane table surveying. (15)

(b) What can you do if the end of the last line does not meet the starting point in a closed traverse? (10)

Extra

L-4/T-2/ARCH

Date : 10/05/2014

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-2 B. Arch. Examinations 2011-2012

Sub : ARCH 447 (Art and Architecture VI: Modern Art and Architecture)

Full Marks : 140

Time : 3 Hours

The figures in the margin indicate full marks.

USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – A

There are **FOUR** questions in this section. Answer **Q. No. 4** and any **TWO** from the rest.

1. What are the basic precepts of PRODUCTIVISM? Describe elaborately. (20)
2. What is Futurism? How does the architectural projects of Antonio Sant'Elia reflects the spirit of FUTURISM? (20)
3. Describe Herman Hertzberger's work of central Behur in Holland to explain why such works are termed as 'structuralist' by Kenneth Frampton. (20)
4. Write short notes on any two (2) (15×2=30)
 - (a) Bauhaus
 - (b) Japanese Metabolists
 - (c) Neo-Rationalism

SECTION – B

There are **FOUR** questions in this section. Answer **Q. No. 8** and any **TWO** from the rest.

5. What according to H.R. Hitchcock were three major concepts regarding volume, symmetry, and decoration that shaped the formal expression of "International style"? Describe elaborately. (20)
 6. Draw the diagram produced by Charles Jencks regarding Crisis in Architecture, showing eleven causes and their interaction with the three systems of architectural production. Discuss about any one of the causes in detail. (20)
 7. Describe the following terms with reference to the work of Adolf Loos. (20)
 - (a) Applied Decoration
 - (b) Raum Plan
 8. Write short notes on any TWO (15×2=30)
 - (a) Populism in Architecture
 - (b) Archigram
 - (c) CIAM
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