BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-2   B. Arch. Examinations 2012-2013

Sub : **CE 467/425** (River Engineering and Flood Mitigation)

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 any **THREE**.

1. (a) A posttensioned bonded concrete rectangular beam has a prestress of 1800 kN in the steel immediately after prestressing, which eventually reduces to 1650 kN due to losses. The beam carries a uniformly distributed live load of 5 kN/m and three point live loads of 50 kN in addition of its own weight of 5 kN/m (Fig. 1). Compute the extreme fibre stresses in the concrete (using gross section) at a location 10 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.   **(17 $\frac{1}{3}$)**

    (b) Differentiate between: **(6)**

      (i) Anchored and Non-end anchored prestressing

      (ii) Pretensioning and Posttensioning

      (iii) Bonded and Unbonded Prestressing

2. (a) Write down the differences between meridional thrust and hoop stress in a dome.   **(4 $\frac{1}{2}$)**

    (b) Write down the differences between 'vault' and 'barrels shell'   **(6 $\frac{1}{3}$)**

    (c) Write down the names and characteristics of tendons used in prestressed concrete for both pretensioning and posttensioning.   **(4 $\frac{1}{2}$)**

    (d) Describe the factors contributing to loss in prestress.   **(8)**

3. (a) Vierendeel Steel Trusses, spaced 20' apart, are used to support a slab which carries a total factored load (dead load + live load) of 200 psf. The truss consists of 10 panels 15 ft × 10 ft each (Fig. 2). Determine shear force and bending moment of chords at panel 3, 4 and 6. Also calculate the bending moment of web between panel 3 and 4. Given that, fy = 60 ksi.   **(17)**

    (b) Write down the differences between Prestressed and Reinforced concrete.   **(6 $\frac{1}{3}$)**

4. (a) Derive the equation of hoop stress in a dome due to a concentrated load at the crown.   **(19)**

    (b) "Vierendeel Truss does not fit the strict definition of a truss" – explain.   **(4 $\frac{1}{3}$)**

CE 467

SECTION – B

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

5. Draw the shear force and bending moment diagrams for all the girders of the frame as shown in Fig. 3. Use Cantilever method. Values in parentheses indicate cross sectional areas of the columns. **(23⅓)**

6. 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 Fig. 4. All the columns have same cross section and are uniform throughout the height. Use un-factored load. **(23⅓)**

7. (a) Do you think regular structures are better from structural efficiency point of view? Present arguments for and against your answer. **(4)**

   (b) Determine design dead load (DL) and live load (LL) for the column C1 in Fig. 5 at the ground floor level of a 10 storied building. Given that, slab thickness = 5 in., floor finish = 25 psf, partition wall loading = 50 psf and live load = 60 psf. Consideration for self-weight of beams and columns is not necessary. Now, design this column as a square tied column to support gravity loads only using $f_c' = 4$ ksi, $f_y = 60$ ksi

   Assume a proper steel ration within limits and design the necessary ties also. **(19⅓)**

8. (a) What kind of load does a shear wall mainly resist? When does an engineer add shear walls to a structure? **(5⅓)**

   (b) A four storied shear wall is subjected to lateral forces that produce a moment and a shear of 2400 k-ft and 100 k respectively at the bottom. 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, $f_y = 60$ ksi. **(18)**

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50 KN   50 KN   50 KN

Mid depth level

parabolic tendon

400 mm

600 mm   100 mm

4 @ 4 m = 16 m

Mid span section

Fig. 1   for Q. no. 1(a).

1 2 3 4 5 6 7 8 9 10

10'

10 @ 15' = 150'

Fig. 2   for Q. no. 3(a)

(A)   (1·5A)   (A)

(1·5A)   (2A)   (2A)   (A)

10'

8'

15'   12'   8'

Fig. 3   for Q. no. 5

2k/'   2k/'

3k/'   3k/'   3k/'

10'

10'

15'   15'   10'
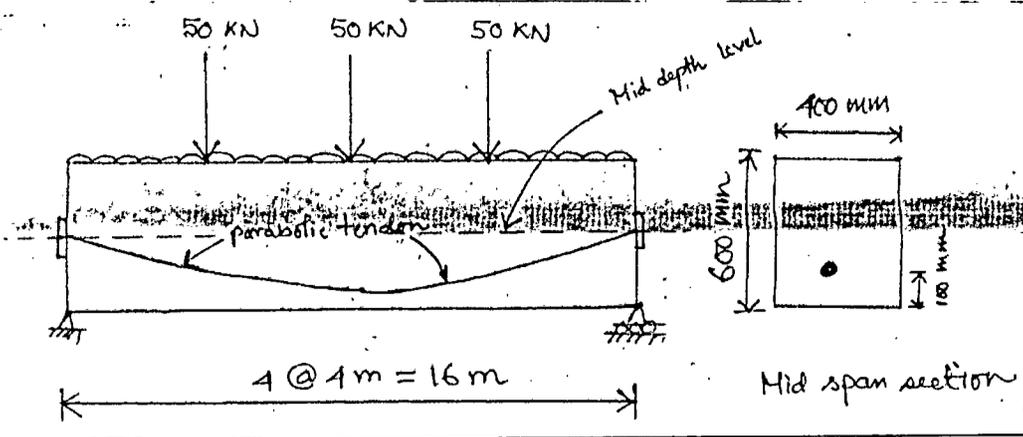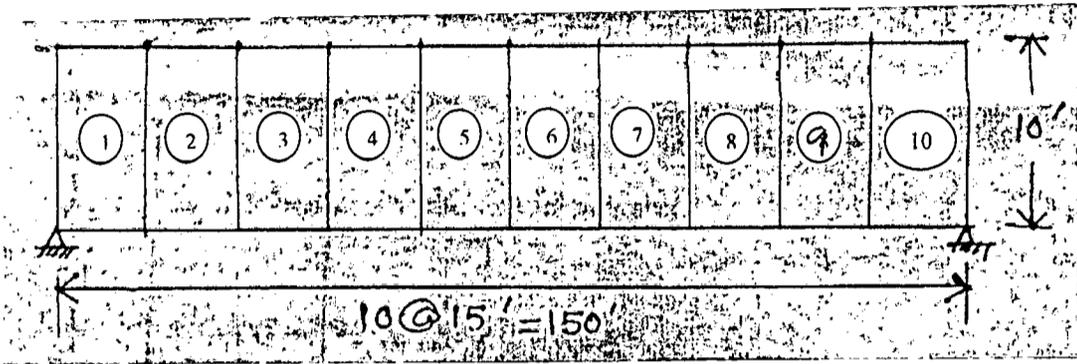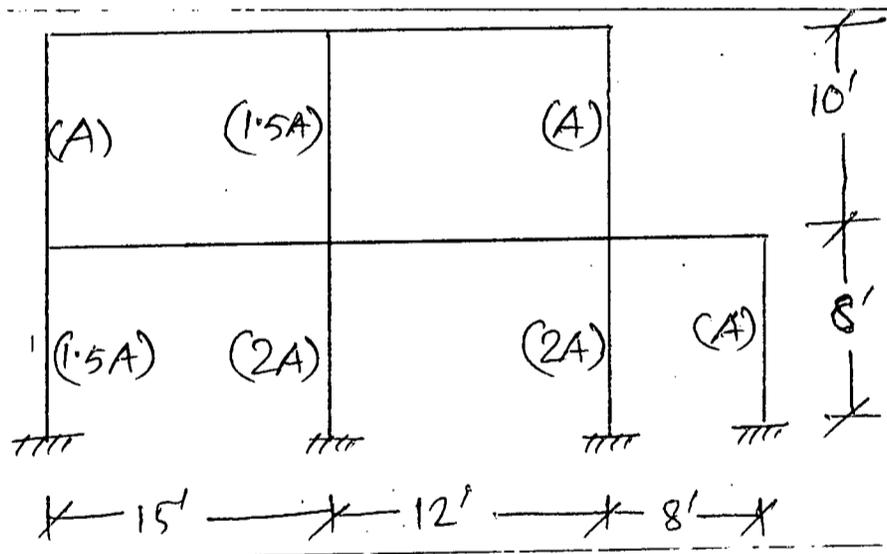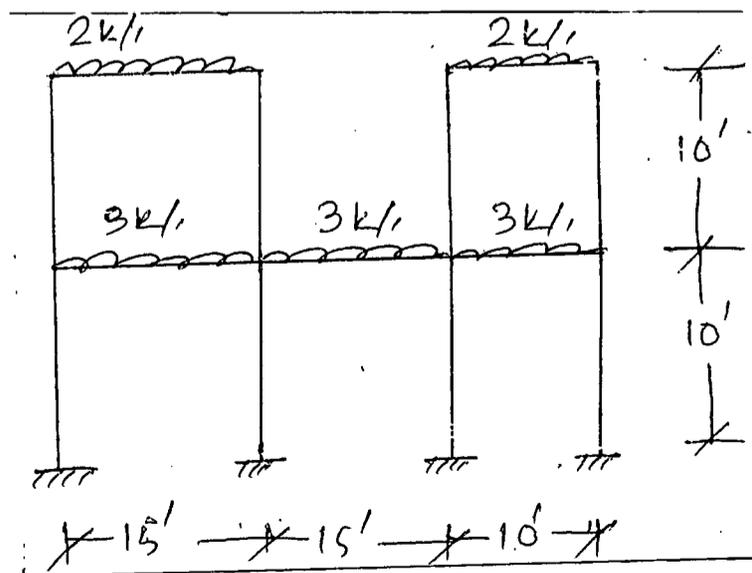
Fig. 4   for Q. no. 6
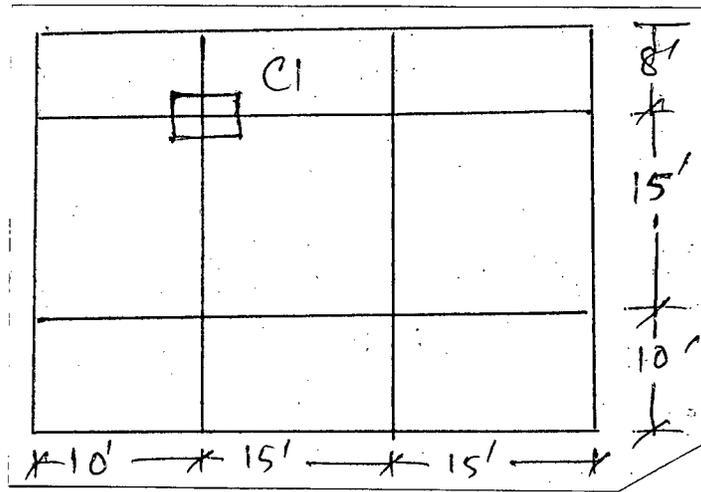
Fig. 5 for Q. no. 7(b).

ANNEXURE 1

$f_y = 60$ ksi, $\qquad f'_c = 3$ ksi, $\qquad \phi = 0.85$

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

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

$\dfrac{A_{vh}}{S_2} \ge \dfrac{V_u - \phi V_c}{\phi f_y d},$ $\quad S_2 \le \dfrac{l_w}{5},$ $\quad$ 3h or 18 in

$\dfrac{A_{vv}}{S_1} \ge \left[0.0025 + 0.5\left(2.5 - \dfrac{h_w}{l_w}\right)\left(\dfrac{A_{vh}}{S_2 h} - 0.0025\right)\right] h$

$$S_1 \le \dfrac{l_w}{3}, \text{ 3h or 18 in}$$

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

$\dfrac{A_{vv}}{S_1}\,(\text{min}) = 0.0025h$

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

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

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-2   B. Arch Examinations 2013-2014

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 **FIVE** questions in this Section. Answer Q. NO. 1 and any **THREE** form the rest.

1. Write True or False for the following statements.   (5×2=10)

    (a) Large corporations and governmental bodies adopted extreme articulation as a major mode of presenting themselves to the world in the seventies. Underneath the smooth exteriors, however, is a violence and distortion odd for the public realm.

    (b) Second machine aesthetic was popular among the academic architects.

    (c) There are similarities in the work of architect Charles Gwathmey and the artist Rene Magritte.

    (d) Cedric Price looked to the late capitalist monopolies rather than to the state to provide architecture as a public, free service.

    (e) Architect Michael Graves expressed that the transformational drawings are more important that the building; they are what the building ultimately signifies.

2. What were the four reasons for the failure of modern architects?   **(20)**

3. Explain the following statement with the description of some (maximum of five) projects, "Few late modernist architects took off in a more purely sculptural direction.   **(20)**

4. Write the difference between first and second machine aesthetics. Describe Pompidon Center, Paris, as the glorious climax of Late Modernism.   **(20)**

5. Richard Meier's early white pavilions are inversion of Corbusian syntax. Describe this statement with the help of Meier's early white pavilions.   **(20)**

SECTION – B

There are **FIVE** questions in this Section. Answer Q. No. 10 and any **THREE** from the rest

6. Briefly write either Peter Eisenman's or Michael Graves' attitude towards architecture with description of relevant projects.   **(20)**

7. Explain how social factors influenced late modern spaces in architecture. Describe Cedric Price's altitude towards architecture by explaining one of his projects.   **(20)**

ARCH 447

8. Why were projects built in Italy and Japan, under the historicist frame work, more successful than in North America? Explain Paolo Portoghesi's architecture through the Mosque and Islamic Center in Rome, Italy. **(20)**

9. Explain how architects, such as Darbourne, Darke, Maguire and Murray, changed the scenario of public housing in 1960's through their design of Lillington street housing and student housing, University of Surrey, England. **(20)**

10. Write TRUE or FALSE for the following statements. **(5×2=10)**

(a) Architect Peter Eisenman used cut out cardboard aesthetics.

(b) Theo Van Doesburg and Piet Mondrian influenced John Heyduk's Dimond Series project.

(c) Buckminister Fuller, Archigram and Frei Otto inspired the lightweight tradition of second machine aesthetics.

(d) The late modern space is similar to Dom-ino block of Le Corbusier, as if it is exaggerated in length and breadth to give new type of space.

(e) Richard Meier's Smith house is made out of concrete to resemble Corbusian syntax.

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-2   B. arch. Examinations 2012-2013

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 any **THREE**.

1. Why is growth, flexibility and expandability of critical importance in hospital design? How can it be addressed in hospital planning and design? What significance does hospital engineering hold in the aspect? **(5+11+7⅓=23⅓)**

2. (a) Discuss the basic principles followed in planning for in-patient facilities and services.

    (b) Give the basis and layout of (i) Nightingale ward (ii) Rigs ward and (iii) Friesen Race-Track ward. **(7+16⅓=23⅓)**

3. Discuss climate as a determinant in hospital design with special emphasis on inpatient areas. **(23⅓)**

4. (a) What precautionary measures need to be taken to ensure hospital hygiene? **(12)**

    (b) How is environmental hygiene control exercised in an operating theatre suite? **(11⅓)**

SECTION – B

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

5. (a) What is the concept and objective of the regionalized healthcare system? On what, the success of the regionalized healthcare system depends? **(8⅓)**

    (b) Explain with the help of a diagram the hierarchy of healthcare facilities, from. Primary care to tertiarycare institution and the nature and focus of health care services affected at each level. Elaborate on the referral system. **(15)**

6. (a) Classify and explain the typology of hospitals on the basis of service and ownership. **(7)**

    (b) How is public control exercised over hospitals? **(7)**

    (c) Briefly discuss the need and means of controlling hospital costs. **(9⅓)**

ARCH 497

7. (a) What is a "Brief". What information are required to be provided in a hospital brief? **(5)**

(b) Diagrammatically explain the concept of the multiprofessional planning team. **(8)**

(c) Briefly explain the "systems and standard" technique of planning and designing of hospitals. **(10 ⅓)**

8. (a) Discuss the process of determining the requirements for a new hospital. **(12)**

(b) Explain the method for the calculation of the number and distribution of beds and technical services. **(11 ⅓)**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA
L-4/T-2   B. ARCH. Examinations 2012-2013
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 – A
There are **FOUR** questions in this Section. Answer Q. No. 1 and any **TWO** from the rest.

1. Write short notes on any three: (3×10=30)

    (a) Levels and Levelling.

    (b) Characteristics of closed traverse.

    (c) Closing Error in a closed Traverse

    (d) Foreword Bearing and Backward Bearing.

2. (a) What is Surveying? Classify and explain.   (10×2=20)

    (b) What is Chain Survey? State the Method of Chain Survey.

3. (a) How can you Chain across rivers and buildings.   (10×2=20)

    (b) What is Traverse surveying? Classify and explain.

4. (a) Prescribe with illustration, Traversing method of plane table surveying. Discuss

    errors advantage and disadvantages of plane table surveying.   (10×2=20)

    (b) How can you get a total picture of a lands elevation at different points, Explain in

    terms of longitudinal levelling and cross sectional levelling.

SECTION – B
There are **FOUR** questions in this Section. Answer any **THREE**.

5. Write short definition of research. Distinguish the difference between qualitative and

    quantitative research methods with examples.   (23 ⅓)

6. Elaborately describe the different stages of a scientific research.   (23 ⅓)

7. What is a questionnaire? Describe the factors to be considered while framing

    questionnaires with examples.   (23 ⅓)

8. What are the principal methods of collecting data? Explain the suitable approaches of

    interviewing in context of Dhaka with their relative advantages and disadvantages.   (23 ⅓)

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-2   B. ARCH Examinations 2012-2013

Sub : **ARCH 473** (Housing)

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. Write short notes on: (3×8=24)

    (a) Adequate Shelter (b) Modernization (c) Slums

2. (a) Explain the concept of dwelling.   (5)

    (b) How would you consider Christian Norberg-Schulz's collective and private modes of

    dwelling in a rural context in Bangladesh?   (9)

    (c) 'House is an institution for dwellers' ideal living environment' – explain from a socio-

    cultural perspective.   (9)

3. (a) Explain modern house.   (5)

    (b) Discuss the relationship between modernity and housing for the transformation of

    rural housing in Bangladesh.   (9)

    (c) Elaborate briefly, 'Housing as a system of designs'.   (9)

4. (a) How would you estimate housing deficit in a city?   (5)

    (b) What are the major causes and policy responses to rural-urban migration? (9)

    (c) Explain the types of homelessness in the 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) Generic components of housing.

    (b) Housing delivery system.

    (c) Attributes of sustainable house.

6. (a) Explain housing policy   (5)

    (b) Compare the objectives of providing and supporting housing paradigms.   (9)

    (c) Discuss the ends, means and ways of housing.   (9)

ARCH 473

7. (a) Explain sustainable shelter. **(5)**

    (b) What are the policy guidelines for addressing sustainable shelter? **(9)**

    (c) Discuss the perceptions and critique of 'housing for the poor' approach. **(9)**

8. (a) Explain housing policies sustainable turn. **(5)**

    (b) How in your view, sustainability differs in the formal and informal sector housing? **(9)**

    (c) Discuss from your design studio experience, the heed of privacy, personal space and shared space in housing design. **(9)**