BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-1  B. Arch. Examinations 2015-2016
Sub: ARCH 431 (Environment and Design IV: Landscape Design)

Full Marks: 140  Time: 3 Hours
USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.

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

1. What are the strategies would you follow to design open spaces to attain ecologically and culturally responsive neighbourhood in the context of new Dhaka.  (22)

2. Distinguish between the conventional definition of landscape and landscape ecology. State the foci of landscape ecology.  (16)

3. What is plant community? Suggest an appropriate plant community for Dhaka city.  (16)

4. What is ecological services? Why we need to preserve mangrove forest (Sundarban)?  (16)

5. How soil plays an important role to preserve overall ecosystem of a particular area? Use necessary sketches.  (16)

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

6. (a) What is ‘Altered Landscape’? Write about appropriate measures to mitigate flooding in urban context due to altered landscape.  (23)
(b) How watershed ecosystem services influence health, safety and welfare?  (7)


8. (a) What is water smart landscaping? State the benefits of water smart landscaping. What are the means to attain ‘Water Smart Landscaping’?  (15)
(b) What are the steps involved in planting?  (5)

9. Write short notes on the following: (Any two)  (10×2=20)
(a) Green infrastructure and climate change.
(b) Phytoremediation.
(c) Site development objectives.
SECTION – A

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

1. (a) What do you mean by concrete cylinder strength, $f'_c$ and yield strength of steel $f_y$? (5½)
   (b) A rectangular beam has the dimensions as shown in Fig. 1 and reinforced with 3 - #9 bars. Determine the stresses caused by a bending moment, $M = 150$ K-ft. (18)
   Given, $f'_c = 4000$ psi, $f_y = 60$ ksi, $n = 8$
   $f_r$ (modulus of rupture) = 475 psi.

2. (a) An 8 – ft span cantilever beam has a rectangular section and reinforcement as shown in Fig. 2. The beam carries a dead load, including its own weight, of 1.5 k/ft and a live load of 0.9 k/ft. Using $f'_c = 4$ ksi, $n = 8$, $f_r = 24$ ksi, check if the beam is safe to carry the above loads. Use WSD method. (13½)
   (b) Determine the ultimate moment capacity of the beam section as shown in Fig. 1. (10)

3. (a) Design the web re-inforcement of the beam as shown in Fig. 3 by WSD method. (20)
   Given, $f'_c = 3$ ksi, $f_r = 24$ ksi, $n = 9$
   (b) It is good practice to design the beam such that the failure would be initiated by yielding of steel rather than by crushing of concrete. Why? (3½)

4. (a) A floor system consists of a 4-inch concrete slab supported by continuous T beams of 24-ft span, 48 in. on centers, as shown in Fig. 4. What tensile steel area is required at midspan to resist a working moment of 2600 kip-inch? (16)
   Given, $f_s = 20$ ksi, $f'_c = 4000$ psi, $n = 8$
   (b) Describe the flexural behavior of reinforced concrete beam under various loading stage-
   (i) at low loads
   (ii) at moderate load which causes tension cracking.
   (iii) at ultimate load (7½)

Contd ………… P/2
5. Using WSD method, design the beam as shown in Fig. 5. The beam carries a uniform live load of 3 k/ft. Consider self-weight of the beam in addition to the live load. Draw the reinforcement details also. 

\[ f' = 4000 \text{ psi}, f_s = 24 \text{ ksi}, n = 8 \]

(23.5)

6. (a) Using WSD method, design the one way slab panel ‘S1’ as shown in Fig. 6. The slab carries a uniform live load of 45 psf and a dead load of 30 psf in addition to its self-weight. Draw the reinforcement details also. Use ACI moment coefficients as given in Fig. 7 for calculation.

\[ f' = 4000 \text{ psi}, f_s = 24 \text{ ksi}, n = 8 \]

(18)

(b) Draw with neat sketches different type of RC floor systems and briefly describe them. (5.5)

7. Using WSD method, design the two way slab panel ‘S1’ as shown in Fig. 8. The slab carries a uniform live load of 40 psf and a super-imposed dead load of 30 psf in addition to its self-weight. Draw the reinforcement details also. Use ACI moment coefficients as given in Table 1, 2 and 3 for calculation.

\[ f' = 4000 \text{ psi}, f_s = 24 \text{ ksi}, n = 8 \]

(23.5)

8. Check the adequacy of a flat plate as shown in Fig. 9 against punching shear. The slab carries a uniformly distributed working load of 150 psf in addition to the slab self-weight. The thickness of the slab is 10” and the columns are 14” X 14” in dimension.

\[ f' = 4000 \text{ psi}, f_y = 40 \text{ ksi} \]

(20)

(b) For a slab with longer to shorter span ratio greater than 2, it acts as a one way slab. Why? (3.5)
Summary of ACI moment coefficients: (a) beams with more than two spans; (b) beams with two spans only; (c) slabs with spans not exceeding 10 ft; (d) beams in which the sum of column stiffnesses exceeds 8 times the sum of beam stiffnesses at each end of the span.

Figure: 0405

Discontinuous end unrestrained:

Spandrel:

Column:

(a)

Discontinuous end unrestrained:

Spandrel:

Column:

(b)

(c)

(d)

Figure: 0506

Figure: 0707
**Table 01**

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*A construction edge indicates that the slabs continue across, or is fixed at, the support; an unconstruction edge indicates a support at which vertical resistance is negligible.

**Table 02**

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*A construction edge indicates that the slabs continue across, or is fixed at, the support; an unconstruction edge indicates a support at which vertical resistance is negligible.
**Table 03**

**Coefficients for live load positive moments in slabs**

\[ M_{a, pos \_ll} = C_{a, ll} w_{ll}^2 \]
\[ M_{b, pos \_ll} = C_{b, ll} w_{ll}^2 \]

where \( w \) = total uniform live load

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* A crosshatched edge indicates that the slab continues across, or is fixed at, the support; an unmarked edge indicates a support at which torsional resistance is negligible.
SECTION – A
There are FOUR questions in this section. Answer Q No. 4 and any TWO from the rest.

1. (a) Discuss the objectives of urban design. (10)
   (b) Define the concept of ‘places’. Explain the fundamental principles for creating a successful place. (13)

2. (a) Define “positive space”. What are the principles a designer should follow in creating positive space in urban environment. (13)
   (b) Discuss the principles for analysis of the visual and aesthetic character of the square. (10)

3. (a) What are the factors that should be considered for designing urban project at micro level. (8)
   (b) Discuss the environmental urban design principles for dealing with sun, wind flow, air quality and lighting. (15)

4. Write short notes: (any three) (8x3=24)
   (a) Transparency
   (b) Imeagibility
   (c) Coherence
   (d) Placelessness.

SECTION-B
There are FOUR questions in this section. Answer any THREE questions.

5. (a) Define ‘Urban Design’. Discuss different stages of urban design process. (13)
   (b) Discuss the problem of modern urban design from the point of users’ responses. (10 1/2)

6. (a) Discuss different Methods of Analysis for an urban design project. (15)
   (b) Prepare a matrix of ‘SWOT’ analysis for the development of wetland in Dhaka. (8 1/2)

7. (a) Define ‘Permeability’ of a city. Discuss different methods of permeability analysis. (10 1/2)
   (b) Discuss the five elements of Urban Design that help to make a city legible. (13)

8. (a) Define Environmental impact assessment method for Urban Project evaluation. (8 1/2)
   (b) Discuss different Techniques for Environmental impact assessment that are usually applied in our context. (15)
L-4/T-1/ARCH

Date: 30/01/2017

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA
L-4/T-1 B. Arch. Examinations 2015-2016
Sub: ARCH 445 (Architectural Conservation)
Full Marks: 140  Time: 3 Hours
USE SEPARATE SCRIPTS FOR EACH SECTION
The figures in the margin indicate full marks.

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

1. (a) What do you understand by the term 'Architectural Conservation'?  
   (b) Give a historical account of the architectural conservation practice, focusing on  
   ‘why’ and ‘what’ to conserve.  

2. (a) What are the basic tools and charters- both national and international, that governs  
     ‘Architectural Conservation’ in Bangladesh.  
   (b) List 10 UNESCO recognized charters on architectural and historic conservation,  
     mentioning the areas of focus in each case.  

3. (a) Critically discuss the general threats and challenges to conservation.  
   (b) Discuss the principle causes of decay in heritage properties.  

4. (a) What are the objectives of ‘Architectural Conservation’?  
   (b) Evaluate ‘Ahsan Manzil’ conservation in the light of the objectives of conservation.  

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

5. (a) What are the types and approaches of architectural conservation?  
     (b) What are the “values” in architectural conservation for the consideration of a case  
     for conservation? Categorize them under different heads and discuss.  

6. (a) What do you understand by “Area conservation”? How are the conservation areas  
     designated?  
   (b) Discuss how conservation of areas differs with architectural conservation.  

7. (a) Critically discuss “Architectural Conservation” ethics.  
   (b) Elaborate on ‘Authenticity’; ‘Patination’; ‘Conjecture’.  

8. (a) What is World Heritage List? Discuss.  
     (b) What are the essential steps to be taken for an area to be nominated for inclusion is  
     the ‘World Heritage List’.  

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