

**SECTION – A**

There are **FOUR** questions in this section.

Answer question number 1 and any **TWO** from the rest.

1. (a) Considering the functional requirement with respect to the Buddhist religion and philosophy explain the layout plan of Nalanda Vishwavidhalaya (Nalanda University). How it was developed from the primary form of Buddhist Vihara? Use sketches. (15)  
(b) Mention the academic programme, method of teaching, revenue earning and expenses etc. of this ancient institution. (9)
2. (a) What are the basic planning features of a Vedic city? Describe the main layout plan, Foundation of the city wall, architectural and decorative features of principal buildings of Pataliputra city of Chandragupta Maurya. (13)  
(b) Identify at least 10 ancient cities and river ports of Bengal (with sources of reference) and their present geographical location on a map. (10)
3. Chronologically demonstrate the development of Buddhist temple, starting from the Gupta period. Interpret with sketches how the evolution of style has possibly been accommodated in the temple plan of Paharpur. (23)
4. (a) Describe from your own observation the changes identified in different construction phases in the temple plan of Shalban Vihara and establish the reasons for the changes executed therein with illustrations. How do the plans differ from the Paharpur temple plan? (23)

**SECTION-B**

There are **FOUR** questions in this section. Answer question number 5 and any **TWO** from the rest.

5. (a) “ The conception as a whole presents the appearance of the forum of some ancient classical city rather than a self-contained Muslims house of prayer” – identify the building and critically evaluate its architectural features after Percy Brown, use sketches. (18)  
(b) Mention how the Islamic building art of Bengal is classified into phases. (6)

## ARCH 355

6. Describe the sequence of spaces identified in 'Dakhil Darwaza'. Why it is said to be a fusion of 'Classic and Romantic' with traces of indigenous features. Use necessary drawings and sketches. (23)
  7. Describe the specific indigenous features of the style and materials used in Curzon Hall and Ahsan Manzil with necessary sketches. (23)
  8. Beside the ruling community, the native elite group of 'The Zamidar's' were found to be responsible in developing a colonial culture and subsequently for the development of a local architecture" – Explain the statement with appropriate example and sketches. (23)
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**L-3/T-2/ARCH**

**Date : 19/02/2018**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2 B. Arch. Examinations 2016-2017

Sub : **ARCH 807** (Theories and Practice of Urban Design)

Full Marks : 140

Time : 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.

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**SECTION – A**

There are **FOUR** questions in this Section. Answer question No. 1 (ONE) and any **TWO** from the rest.

1. Answer any two (02) of the following questions: **(15× 2=30)**
- (a) Define Urban Space. What are the various types of urban spaces? Describe briefly and use sketches to explain those.
- (b) What are the goals of Urban Design Projects in current context? What are the phases of urban design process? Discuss.
- (c) What are the different dimensions of Urban Space? Define each with brief description.
2. (a) Discuss how 'Local Context' needs to be considered in designing Urban Space. **(10+10=20)**
- (b) Explain 'Global Sustainability Context' for Urban Space design.
3. (a) What is the 'Perceptual Dimension' of urban space? Enumerate 'its' different types and discuss the factors that influence it. Describe in brief using sketches. **(10+10=20)**
- (b) Define 'Place Image', 'Imageability' and 'Mental Map' from urban design perspective.
4. (a) What are the 'Morphological Elements' of Urban design? Elaborate. **(10+10=20)**
- (b) Distinguish between 'Buildings defining space' and 'Buildings in space'. Use sketches to explain.

**SECTION – B**

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

5. Answer any three (03) of the following questions: **(10× 3=30)**
- (a) Write on various types of outdoor activities in Urban Space and discuss how quality of Physical Environment influence them.
- (b) Compare the Rationalist and Empiricist philosophies particularly focusing the premise of urban Design.
- (c) Describe 'Monument' and 'Place' according to Aldo Rossi.

Contd ..... P/2

**ARCH 807**

**Contd ... Q. No. 5**

(d) Enumerate Your Propositions how to improve the quality of Public spaces of Dhaka City.

6. (a) Characterize the Medieval, Renaissance, and Modern urban space in relation to outdoor activities they used to generate. **(15+5=20)**

(b) Write on Jan Gehl's Five (5) rules for designing Great Cities.

7. (a) Discuss the philosophical premises of Rationalists with examples of Laugier, Ledoux and Boullée. **(10+10=20)**

(b) Discuss briefly on "Neo-Rationalist concept of Krier Brothers."

8. (a) Write major critiques of Neo-Rationalists. **(5+15=20)**

(b) Elaborate Coumillo Sitte's concept for Picturesque' Urban Design.

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BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2 B. Arch. Examinations 2016-2017

Sub : **ARCH 813** (Architectural Conservation)

Full Marks : 140

Time : 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The questions are of equal value.

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**SECTION – A**

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

1. What is your idea regarding a historic site and its conservation. Explain with illustrative examples.
2. What are the core approaches for documenting a historic site for conservation? List the essential points and discuss.
3. What are the cultural significance in a building? Does all old building contain cultural significance? Discuss.
4. What is your opinion about the state of architectural conservation in Bangladesh? Does it have adequate legislative framework for operation?

**SECTION – B**

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

The figures in the margin indicate full marks.

5. Discuss Restoration and Reconstruction with necessary examples. (23 1/3)
  6. What kind of conservation process would be in 'SHOMPUR MAHA VIHARA' – Give you opinion. (23 1/3)
  7. Define intangible heritage and tangible – Heritage with proper examples. Name one intangible heritage of Bangladesh – which is – becoming extinct. (23 1/3)
  8. "খামার বাড়ী ল্যাবরেটরী" - (Khamar bari; laboratory) – was demolished some months back; did the building contain historic significance to the nation, as well as to you? Give your solution in the light of conservation guide line. (23 1/3)
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**SECTION – A**

There are **SEVEN** questions in this section. Answer Q. 7 and any **FIVE** from the rest.

1. (a) Define 'Scale' in Urban Design. **(3+7=10)**  
(b) Discuss scale in terms of human vision and interactive space.
2. (a) What are the fundamental 'shapes' of a settlement layout? **(5+5=10)**  
(b) What factors influence the settlement pattern?
3. Illustrate 3-D representation of Urban Design Principles , scale and the process with appropriate labelling. **(10)**
4. (a) What are the corner stones of any urban design endeavor. **(4+6=10)**  
(b) Discuss the 'Domain of Urban Design'.
5. (a) What are the measurable urban design criteria? **(3+7=10)**  
(b) List various natural criteria and discuss their impacts on the built-environment.
6. (a) Discuss spatial organization of a region focusing on sequential phase relationship.  
Illustrate where necessary. **(10)**
7. Write notes on any two of the following: **(10×2=20)**
  - (a) Non-measurable Urban Design criteria
  - (b) Scale and neighbourhood size.
  - (c) Garden city.

## ARCH 345

### SECTION-B

There are **SEVEN** questions in this section. Answer Q. 14 and any **FIVE** from the rest.

8. Discuss the 'basics and attributes' of Urban Design at various levels of intervention. **(10)**
  9. Write the salient features of Greek and Roman urban settings. **(10)**
  10. Discuss the context and its spatial effects on 19<sup>th</sup> and 20<sup>th</sup> century urban design and development. **(10)**
  11. Elaborate the role of 'Circulation and Parking' in terms of the domain and elements of Urban Design. **(10)**
  12. (a) What factors contribute to the 'Quality of environment'? **(5+5=10)**  
(b) Trace out the role of 'open space' and 'pedestrian ways' in Urban Design.
  13. Identify the 'scale and enclosure' determinants of Urban Design element 'Building form and massing'. **(10)**
  14. Write notes on any two (02): **(2×10=20)**
    - (a) Image of the city
    - (b) Key aspects of Urban Design
    - (c) Accessibility and connectivity in Urban Design.
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**SECTION – A**

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

1. (a) What are the sources of water in Dhaka city? (23  $\frac{1}{3}$ )  
 (b) How is it collected and distributed?  
 (c) List and explain the major problems of water supply in Dhaka city.  
 (d) What measures are taken by users to overcome the problems, explain with reasons?
2. (a) In the context of Dhaka city, explain why knowledge and proper design of plumbing system has become more inevitable? Explain with reasons. (10)  
 (b) List and explain all the possible scopes of plumbing system in a building. (13  $\frac{1}{3}$ )
3. (a) In the design of plumbing system what are the issues that must be considered. List and explain with reasons. (18  $\frac{1}{3}$ )  
 (b) What is staging? Where is it needed in the plumbing design in building water supply system? Explain. (5)
4. (a) In a diagram show the details of House Water connections and label the various components. Justify the rationale for inclusion of each of those. (13  $\frac{1}{3}$ )  
 (b) List and explain the factors determining the per capita water consumption. (10)

**SECTION-B**

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

5. (a) As a student of Architecture, why do you think that plumbing is important? Explain. (10)  
 (b) Differentiate between the followings: (9)
  - (i) Black water and Grey water
  - (ii) Building Drain and House Sewer
  - (iii) Vent pipe and Anti siphonage pipe
- (c) What rules should be followed in connecting the vertical stacks with building sewer for different drainage systems? (4  $\frac{1}{3}$ )



**CE 271**

6. (a) What is the purpose of water seal in a trap? What is the minimum recommended depth of a water seal and how is it measured? Show that with a neat sketch. (6  $\frac{1}{3}$ )
- (b) Write down the minimum sizes for the following drainage pipes: (12)
- (i) Soil pipe
  - (ii) Waste pipe (horizontal)
  - (iii) Waste pipe (vertical)
  - (iv) Vent pipe
  - (v) Anti-siphonage pipe connecting soil pipe
  - (vi) Anti-siphonage pipe connecting waste pipe
- (c) With a diagram, describe the water cycle of a plumbing system. (5)
7. (a) Why and where is a Septic Tank required? Design a two chambered Septic Tank for a six storied two unit apartment building where average family size is six and wastewater flow rate is 100 lpcd. (16)
- With a neat sketch, show the dimensions of the designed Septic Tank. Also mention the recommended wall thickness and concrete mix ratio for the Septic Tank. (Assume any reasonable value of missing data if necessary).
- (b) What factors should be kept in view in installing the vertical drainage pipes in a building? (7  $\frac{1}{3}$ )
8. (a) State the factors which should be considered in planning of a toilet system in a building. (4)
- (b) Define Drainage Fixture Unit Value (DFU). Why is sunken floor necessary? State the recommended guidelines to place the pipes in sunken slab. (9)
- (c) Determine the number of Rain Water Pipe (RWP) for a roof area of 6250 sft. The intensity of rainfall is 4 inch/hr. (10  $\frac{1}{3}$ )
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BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2 B. Arch. Examinations 2016-2017

Sub : **ME 363** (Mechanical Equipment)

Full Marks: 140

Time : 3 Hours

Assume reasonable values for any missing data. Symbols have their usual meanings.

Refrigeration and A/C Data Book will be provided.

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** questions.

1. (a) The essential requirements for sustaining a fire could be best represented by a “fire tetrahedron” instead of a “fire triangle” – explain. How smothering is achieved? Why smothering methods may re-ignite the fire? (8 1/3)
- (b) Describe briefly a CTC type fire extinguisher. What are its advantages? What precautions should be made when the fluid of this type is sprayed over red hot metals? (5)
- (c) What are the main ‘2’ points a fireman should bear in mind when fire-fighting a sprinkle red building? If it is impossible to turn off the main stop valve in such type of building, how water damage could be prevented? (5)
- (d) Draw and label a fusible solder type sprinkler head. (5)
  
2. (a) Break down the total round-trip time of 30 seconds into its components with passenger or elevator actions by a simple two-stop elevator. (8 1/3)
- (b) With a typical arrival rate versus time curve, describe “a 5-minutes traffic peak” related to elevating. (5)
- (c) Explain the following formula for an elevator trip: (5)

$$\text{Probable Stop} = S - S \left( \frac{S-1}{S} \right)^p$$

where, symbols have their usual meanings. For a 16 passenger with 12 upper-floor elevator trip, determine the approximate probable stops.
- (d) Draw and label a typical escalator showing its space requirements. (5)
  
3. (a) How efficient elevating is achieved by minimizing 5 time factors? Show with neat sketches the difference between 4 types of door opening of elevators. (10)
- (b) Compare the loads of the overhead structures of an elevator when the machines are placed near the top of the well to those placed near the bottom of the well. (8 1/3)
- (c) What is premature door opening? What is the limitation of a premature door opening? (5)

**ME 363/ARCH**

4. (a) Estimate the cooling load for a class room of 35 students in Bangladesh (24° N latitude), assuming no heat transfer through floor, North and East walls; door and windows are in South only. Following specifications are given, use the tables and charts for other necessary data.

(23 1/3)

Room Size: 11m × 8m × 3.64 m, orientation: East-West

1 Door: 1.22 m × 2.13 m (height) × 25 mm thick plywood (Douglas Fir) 2

Windows: 1.83 m × 1.22 m (height) × 3 mm cellular glass lights: 400  
Watts/CLF = 0.07

Walls: 254 mm brick with 12.7 mm plaster, both sides, group B walls

Roof type: Number 5, 25 mm wood with 50 mm insulation 12.7 mm Gypsum  
Board without suspended ceiling

Ventilation: 7.5 litre/s per person

Infiltration: 0.5 air change per hour.

**SECTION-B**

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

5. (a) What are the deviations occur in a real vapor compression cycle from Ideal vapor compression cycle? Draw the block diagram of a vapor compression refrigeration system and at depict this on a p-h and T-S diagram.

(11 1/3)

(b) Calculate the power required by the two compressors in a R134a system which serves a 50 kW evaporator at -40°C and a 60kW evaporator at -10°C respectively. The system uses two stage compression with inter-cooling and removal of flash gas. The condensing temperature is 26 °C and the intercooler temperature is -10°C. Draw the schematic diagram and P-h diagram of the system. Also calculate the COP of the system.

(12)

6. (a) What are the differences between refrigeration and air-conditioning system? Make comparison between window type and split type air conditioning system with respective schematic diagram. Briefly describe the working principle of all air central air conditioning system with schematic diagram.

(11 1/3)

(b) What are the factors that influence the thermal comfort of human being?  
Air enters a heating section at atmospheric pressure, 14°C and 80 percent relative humidity at a rate of 30 m<sup>3</sup>/min, and it leaves at 25°C. Draw a psychrometric chart, show the process on it and determine (i) the rate of heat transfer in the heating section and (ii) the relative humidity of the air at the exit.

(12)

**ME 363/ARCH**

7. (a) An air conditioner supplies air to three rooms in a small office premises. The schematic layout of the duct system and the volume flow rate to each room is shown in Figure for Q. No. 3(a). The length of each duct-segment is tabulated in Table. (i) Size the duct system using the equal-friction method. The duct shall be of standard round sections with diameters in increments of 25 mm. The air velocity in the first section is not to exceed 8 m/s. (ii) Estimate the static pressure in the index run of the duct network and indicate the amount of dampening in the other branches to balance the flow. Consider a pressure drop of 25 Pa at each of the outlet grilles at D, E and F. In the calculation, consider the resistance due to the elbow and Tee as 10 Pa and 15 Pa respectively.

(18 1/3)

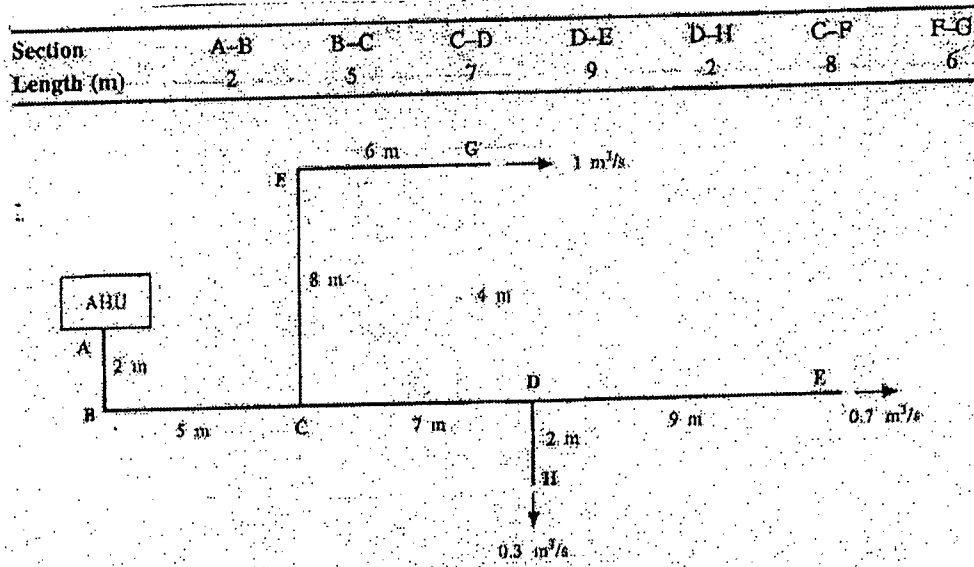


Figure for Q. No. 7(a)

- (b) What are the basic characteristics of quick freezing process? Classify quick freezing processes. (5)
8. (a) Make comparison between ducted split type, multi-split type and VRF type air conditioning system with respective schematic diagram. (12)
- (b) Make comparison between all air type and all water type central air conditioning system with respective schematic diagram. (11 1/3)

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**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 two from the following: (15×2=30)
  - (a) Curvilinear spaces
  - (b) Tight Fit and Loose Fit plan arrangements
  - (c) The vertical dimension of space.
  
2. (a) Explain the concept of space. What are the geometric elements that articulate and define space? Explain with necessary drawings. (12+8=20)  
(b) How will technological advancement influence future Interior Design? Explain the case of future office Interior Design.
  
3. (a) Mention the design principles that can maintain a sense of visual order in an interior space. Explain 'Balance' and 'Emphasis' with necessary sketches. (12+8=20)  
(b) Explain how a sense of visual order among used design elements of interior space has been maintained in Bait Ur Rouf Mosque, Dhaka.
  
4. Discuss three different types of structural system; Linear structural system, Planar Structural system and volumetric structural system with necessary sketches. (20)

**SECTION-B**

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

5. Write short notes on any two from the following: (15×2=30)
  - (a) Ceiling Forms
  - (b) Wall Articulation
  - (c) Carpet Textures.

## ARCH 801

6. Name and draw different types of doors and windows according to its operation and construction. **(20)**
7. (a) What are the functional, aesthetic and economic factors to be considered in specifying finish materials? **(8+12)**  
(b) Name different types of finish flooring applied on top of hard flooring. Explain tile and stone flooring with necessary drawings.
8. (a) Draw and explain different types of walls and partitions used to create or separate spaces within a building. **(12+8)**  
(b) How variation and height of opening gives different senses of indoor spaces?
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**SECTION – A**

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

1. (a) What are the types and purposes of specification? Briefly discuss the general rules used to be followed while writing specification. (10)  
 (b) Both specification and drawings are required to express every schedule of items in a Book of specification – Explain with examples. (10)
2. (a) Mention different points considered in general and specific paragraph. (10)  
 (b) Discuss different pre-bid and post-bid supplemented documents included in specifications. Mention key points of any three supplemental documents. (15)
3. What is meant by 'Specification Format'? Discuss specification format with respect to the following. (25)
  - (a) Size
  - (b) Title page
  - (c) Index of Section
  - (d) Form
  - (e) Page numbering Systems.
4. Write short notes on the following (Any Two). (12 1/2 × 2 = 25)
  - (i) Door, Window and Finish Schedule
  - (ii) Specification Sections
  - (iii) Arrangement of drawings and sections.

**SECTION-B**

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

5. Specify the following building materials/combination of materials in relation to construction work. (Any Four) (20)
  - (a) Wood
  - (b) Cement/Sand
  - (c) Brick soling in foundation and floor
  - (d) Coarse and Fine Aggregate
  - (e) Aluminum Door/Window.

## ARCH 561

6. Discuss the necessity for inclusion of 'General condition of contract in a set of specification/ Tender documents. Discuss at least five points in standard conditions of contract between Owner and Contractor. **(25)**
  
  7. Name different types of brick work required for superstructure of a R.C.C. building. Discuss any two types of brick work with respect to their scope, materials, method of construction and precautions. **(25)**
  
  8. Write short notes on the following Schedule of items (Any Two). **(12.5×2=25)**
    - (a) Sand filling
    - (b) Mass concrete in foundation and floor
    - (c) 25 mm. thick patent stone flooring
    - (d) Plastering.
-