

L-3/T-2/ARCH

Date: 17/01/2021

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2, B. ARCH Examinations (Term: January-2020)

Sub: **ARCH 335** (Architecture of Bengal)

Full Marks: 120

Time: 2 Hours

The figures in the margin indicate full marks

USE SEPARATE SCRIPTS FOR EACH SECTION

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**SECTION-A**

There are **FOUR** questions in this section. Answer **Q.4** and any **TWO** from the rest.  
(Special Instruction: **Open Book Examination**)

1. Draw a plan of Paharpur Buddhist monastery. How could you explain the cruciform shrine of Paharpur Buddhist Monastery in terms of the development of Buddhism in Ancient Bengal? 20
2. Critically evaluate the spatial layout of Nalanda Vishwavidyalaya (Nalanda University) with respect to Buddhist religion and philosophy. In your opinion how did it evolve from the basic idea of a Buddhist Vihara? [use sketches] 20
3. What is your view on the comment, 'Hut is the machine for dwelling in delta'? How could you explain it in the light of Hindu temple architecture development of Bengal during 16<sup>th</sup> to 19<sup>th</sup> c. CE. 20
4. Write short notes on the followings (**any TWO**): 10 x 2= 20
  - a. City of Pataliputra
  - b. Harshavardhana
  - c. Kantajeer Navaratna Temple

**SECTION-B**

There are **FOUR** questions in this section. Answer **Q.8** and any **TWO** from the rest.  
(Special Instruction: **Open Book Examination**)  
Use sketches as necessary

5. Critically evaluate Lalbagh Fort as one of the Mughal establishment in Dhaka. 20
6. Write down the basic differences between a Mughal Mosque and a Sultanate Mosque of Bengal through examples. (incorporate sketches) 20
7. Why did such a large Muslim population emerge in Bengal and particularly in the Eastern part of India so distant from the Middle East, from which, Islam historically expanded? Briefly explain in the light of various theories of Islamization in Bengal discussed in the class. 20
8. Write short notes on the followings (**any TWO**): 10 x 2=20
  - a. Khan Jahan Style
  - b. Ahsan Manzil
  - c. Eklakhi Tomb

L-3/T-2/ARCH

Date: 20/01/2021

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2, B. Arch Examinations (Term: January-2020)

Sub: **Arch 345**, (Fundamentals of Urban Design)

Full Marks: 120

Time: 2 Hours

The figures in the margin indicate full marks

USE SEPARATE SCRIPTS FOR EACH SECTION

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### **SECTION-A (60 Marks)**

There are **FOUR** questions in this section. Answer **Q.1** and any **TWO** from the rest.

(Special Instruction: **Open Book Examination**)

1. Write short note on any One (1) of the following: 10X1=10
  - a) Visionary urban designs of modern period.
  - b) Conservationist and Park Movement
  
2.
  - a) Define 'Urban Design' to reflect how does it form the 3-D urban scene?
  - b) State your argument how urban design is different from urban planning.15+10=25
  
3. What is meant by "Scale" in Urban Design? What are the various types of Scale that are used in Urban Design? Explain with sketches.  
25
  
4. Describe 'International Movement' with the main features of Le Corbusier's 'Uni Ville Contemporaine' and its different developments.  
25

### **SECTION-B (60 Marks)**

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

(Special Instruction: **Close Book Examination**)

5. Answer any one of the following questions: 10X1=10
  - a) What characters of Medieval Towns those allow us to create user friendly cities?
  - b) What are the principles of designing urban mass in cities?

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6. Describe the remodeling project of Campidoglio, Rome, developed by Michelangelo indicating its urban design features.

25

7. Describe the design factors of an Urban Square. Use drawings to explain.

25

8. Compare the organizing principles of Imperial Forum with that of Republican Forum of Rome.

25

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Date:24/01/2021

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2, B. Arch Examinations (Term: January-2020)

Sub: **ARCH 801** (Interior Design)

Full Marks: 120

Time: 2 Hours

The figures in the margin indicate full marks

USE SEPARATE SCRIPTS FOR EACH SECTION

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### SECTION-A (60 Marks)

There are **FOUR** questions in this section. Answer **Q.1** and any **TWO** from the rest.

(Special Instruction: **Close Book Examination**)

1. Write short notes on any **TWO** of the following: (10x2=20)
  - (a) Realisation Sequence
  - (b) Spatial Form
  - (c) Deconstructed Interior
  
2. (a) Briefly explain "Places at zero point"  
(b) "Like the Vitruvian Man inscribed within a circle, the Box Man's perception of geometric boundaries is a projection of his measurements."-Explain (10x2=20)
  
3. Discuss Linear structural system, Planar structural system and Volumetric structural system with neat sketches. 20
  
4. Define Tectonics in Interior Design. Explain the Co-relation between Technology, Tectonics, Production and Construction in Interior Design. 20

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

(Special Instruction: **Close Book Examination**)

5. Write short notes on any 03 (Three) from the following: (10X3 = 30)
  - a) Terrazzo Flooring
  - b) Types of Light Fixtures
  - c) Wall Articulation
  - d) Suspended Ceiling

6. How the noise can be reduced in the interior spaces? Please describe with relevant sketches. (15)
7. Illustrate five examples of the chairs designed by five world renowned architects. (15)
8. "Light is the maker of material, and material's purpose is to cast a shadow"-  
Please explain this with relevant sketches. (15)

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Date:24/01/2021

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2, B. Arch Examinations (Term: January-2020)

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

Full Marks: 120

Time: 2 Hours

The figures in the margin indicate full marks

USE SEPARATE SCRIPTS FOR EACH SECTION

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### **SECTION-A (60 Marks)**

There are **FOUR** questions in this section. Answer **Q.1** and any **TWO** from the rest.

(Special Instruction: **Close Book Examination**)

1. Write short notes on **any 02 (Two)** of the following: (10x2=20)
  - a) Shared Space and Social Space
  - b) Mental Map
  - c) Sense of Place
  
2. a) According to Jan Gehl's theory explain outdoor activities considering urban context of Bangladesh. (10)  
b) Explain Jan Gehl's five rules for designing great cities. Do you agree with these five rules? Provide statements to strengthen your opinion. (10)
  
3. a) Briefly discuss problems and goals of modern urban design. (10)  
b) How can we define a city? Explain evolution of cities in preindustrial, industrial and post industrial era. (10)
  
4. a) What is 'Social Dimension' of urban space? Discuss five key aspects of urban design. (10)  
b) What is 'Visual Dimension' of urban space? Briefly explain environmental preferences framework with sketches. (10)

## **SECTION-B (60 Marks)**

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

(Special Instruction: **Open Book Examination**)

5. Compare the Rationalist and Empiricist philosophies. Discuss the impacts of philosophical shifts in case of Urban Design Projects with examples. (20)
6. Discuss the 'Neo-Rationalist' concept of Krier Brothers. (20)
7. Elaborate Camillo Sitte's concepts for 'Picturesque' Urban Design. (20)
8. Describe the concept of 'City Diversity' presented by Jane Jacobs. (20)

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Date:24/01/2021

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2, B. Arch Examinations (Term: January-2020)

Sub: **ARCH 815** (Industrial Building Design)

Full Marks: 120

Time: 2 Hours

The figures in the margin indicate full marks

USE SEPARATE SCRIPTS FOR EACH SECTION

(Special Instruction: Close Book Examination. Use sketches where necessary.)

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### SECTION-A

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

1. Discuss different green features in industrial building design and explain how it can improve workers health and safety. (30)
2. In order to facilitate present and future needs of an industrial building, what measures should an architect considers in master planning and site development? (30)
3. How does the roof system impact on lighting condition in the industrial working environment? (30)

### SECTION-B

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

4. Write short notes:
  - i) Innovations have an impact on industrial buildings. (15)
  - ii) Industrialization and environmental degradation. (15)
5. Discuss the importance and mention the design criteria for loading and unloading areas of industrial buildings. (30)
6. 'Industry Impacts on site surroundings' – Explain in the light of landscape architecture. (30)



Sub: ME 363 (Mechanical Equipment)

Full Marks: 120

Time: 2 Hours

The figures in the margin indicate full marks.

Students may use Thermodynamics Table, Lift calculation data and HVAC Data Book

Symbols used have their usual meaning and interpretation.

USE SEPARATE SCRIPTS FOR EACH SECTION

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

1. (a) Determine the handling capacity of an escalator having  $30^\circ$  inclination, one passenger per step, a speed of 0.5 m/s and 400 mm step length. (6)
- (b) List the most common safety features arrangement available for a modern lift. (6)
- (c) Write a short note on gas suppression system (8)
  
2. (a) In which conditions the deluge system is preferred over the wet pipe system for sprinkler design. Show with a labelled diagram the main features of a deluge system. (15)
- (b) What are the factors that need to be considered when selecting a sprinkler head? (5)
  
3. Office building located in the city center with diversified use, 16 rentable floors above the lobby, each  $1500 \text{ m}^2$  net floor area. Floor-to-floor height for the lobby is 6.0 meter and for typical floors 3.7 m. Determine a workable elevator system arrangement for this building. (20)
  
4. Estimate the cooling load using CLTD method for a class-room of 60 students in Bangladesh ( $24^\circ\text{N}$  Latitude) with following data and layout plan given below: (20)
  - 1 Door:  $1.25\text{m} \times 2.13\text{m}$  (high)  $\times$  25 mm thick plywood
  - 2 Windows:  $5 \text{ m}^2$  on west and east side, Overall heat conductance  $u=2.86 \text{ w/m}^2$
  - Lights: 450 Watts; CLF = 0.07
  - Roof: Type 4, 50 mm insulation without suspended ceiling
  - Partition walls (East, South and West): Overall heat conductance  $u=2.45 \text{ w/m}^2$
  - North wall: Overall heat conductance  $u=0.515 \text{ w/m}^2$
  - Roof type: type 4, 50 mm insulation without suspending ceiling
  - Ventilation: 7.5 liters per person,
  - Infiltration: 0.5 air change per hour
 (Assume reasonable values for any missing data, use Refrigeration and A/C Data

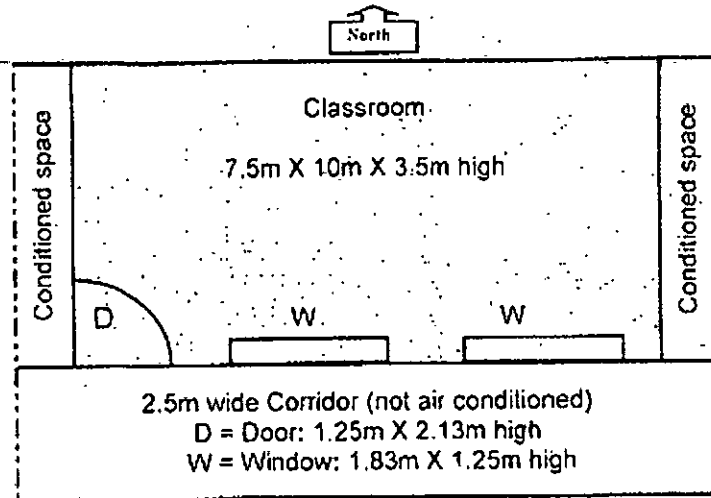


Fig. for Q. No. 4

**SECTION-B**

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

5. (a) What are the differences between refrigerator mode and heat pump mode of vapor compression cycle and also show the differences with schematic diagram. What are the different processes involved in Reversed Carnot cycle? Draw the schematic diagram of the cycle and show the processes on T-S diagram. (10)
- (b) 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. (10)
6. (a) Calculate the power required by the two compressors in a R134a system which serves a 50 kW evaporator at  $-40^{\circ}\text{C}$  and 60 kW evaporator at  $-10^{\circ}\text{C}$ . The system uses two stage compressions with inter-cooling and removal of flash gas. The condensing temperature is  $26^{\circ}\text{C}$  and the intercooler temperature is  $-10^{\circ}\text{C}$ . Draw the schematic diagram and P-h diagram of the system. Also calculate the COP of the system. (10)
- (b) Classify refrigerant and give the name of some common refrigerants. What are the desirable properties of any fluid for use as a refrigerant? (10)

7. (a) What are the factors that influence the thermal comfort of a 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. (10)

(b) Briefly describe the working principle of central air conditioning system with schematic diagram. Make comparison between all air type and all water type central air conditioning system with respective schematic diagram. (10)

8. 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. 4. 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 dampering in the other branches to balance the flow. Consider a pressure drop of 25 Pa at each of the outlet grilles at G, E and H. In the calculation, consider the resistance due to the elbow and Tee as 10 Pa and 15 Pa respectively. (20)

Section	A-B	B-C	C-D	D-E	D-H	C-F	F-G
Length (m)	2	5	7	9	2	8	6

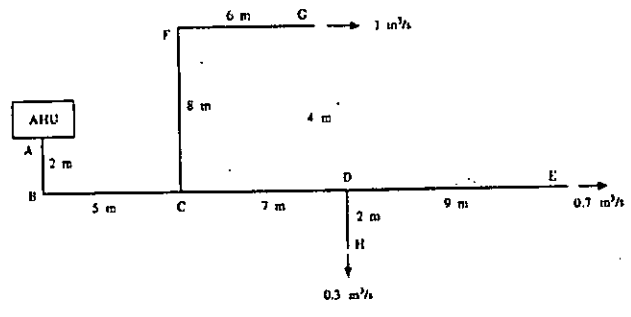


Fig. for Q. No. (8)