

Title of the Course : **History of Architecture I**
Course No: **0731 01 Arch 2105**

Full Marks : 60
Time : 03 Hours

* Figures in the right margin indicate full marks.

Section-A

There are **four (04)** questions in this section. Answer any **three (03)** questions.

- Q.1 a) Explain the architectural features of the The Great Public Bath Of Mahen-Jo-Daro, with neat sketches. [L2; CLO 2] **05**
b) Discuss settlement pattern of the Catal Huyuk civilization with sketches. [L2; CLO 1] **05**
- Q.2 What is optical correction? Analyze the role and impact of optical correction in Greek Architecture with suitable examples from classical Greek temples. [L4; CLO 4] **10**
- Q.3 Evaluate the pyramid's transformation across time, from mastaba to true pyramid, using the appropriate illustrations. [L5; CLO 3] **10**
- Q.4 Write short notes on(any two from the followings) **05X02 =10**
a) Treasury of Atreus
b) Sakra Brae
c) Mausoleum of Great Syrus [L1; CLO 1]

Section-B

There are **four (04)** questions in this section. Answer any **three (03)** questions.

- Q.1 How did the spatial organization of the Roman Forum facilitate civic interaction, political authority, and commercial activities within the urban fabric of ancient Rome? [L1; CLO 1] **10**
- Q.2 Illustrate the basic section of Hagia Sophia, and analyze how its structural innovations influence both construction methods and spatial organization of its interior space. [L4; CLO 4] **10**
- Q.3 Explain the basic structural system of Gupta period temples, focusing on their form, construction methods, materials and spatial organization. [L2; CLO 1] **10**
- Q.4 Identify the architectural and artistic features that distinguish the Ajanta and Ellora caves and explore how these ancient sites portray the cultural and religious diversity of ancient India. [L3; CLO 4] **10**

Title of the Course : **Environmental Psychology and Behavior**
Course No: **0388 01 Soc 2171**

Full Marks : 60
Time : 03 Hours

* Figures in the right margin indicate full marks.

Section-A

There are **four (04)** questions in this section. Answer any **three (03)** questions.

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|-----|---|----|
| Q.1 | a) Define place identity and explain how memories, culture, and experiences shape attachment to place. [L2; CLO 2] | 05 |
| | b) Analyze how disruption of familiar environments may affect users' self-identity and behavior in urban settings. [L4; CLO 4] | 05 |
| Q.2 | a) Discuss how the principles of scale, lighting, materials, and spatial arrangement influence human perception of space. [L2; CLO 1] | 05 |
| | b) Apply these principles to propose design strategies for creating either an intimate courtyard or a grand public hall. [L3; CLO 1] | 05 |
| Q.3 | a) Explain the concept of Sustainability Psychology by Design and its relationship with environmental behavior. [L2; CLO 3] | 05 |
| | b) Apply proxemic principles in designing a classroom, café or public waiting area. [L3; CLO 5] | 05 |
| Q.4 | a) Discuss the principles of Social Design, Biophilic Design, and Evidence-Based Design. [L2; CLO 4] | 06 |
| | b) Apply any one of these approaches in proposing improvements for a university learning environment. [L3; CLO 6] | 04 |

Section-B

There are **four (04)** questions in this section. Answer any **three (03)** questions.

- | | | |
|-----|--|----|
| Q.1 | Analyze with example how sensory qualities shape human comfort, movement, social interaction and sense of belonging within a built environment. [L4; CLO 4] | 10 |
| Q.2 | Evaluate how contrasting spatial qualities such as bold forms, strong colors and soft diffused light, tranquil colors can produce different psychological and behavioral responses in users. [L5; CLO 2] | 10 |
| Q.3 | a) Compare behavioral mapping, social mapping, cognitive mapping and territory mapping with their purpose and information they represent. [L4; CLO 5] | 07 |
| | b) Explain the meaning of spatial impact in architecture and how it can influence human feeling. [L2; CLO 1] | 03 |
| Q.4 | Differentiate different types of interview probes and discuss the role of each probe with relevant example. [L4; CLO 6] | 10 |

Title of the Course : **Climate and Design**
Course No: **0731 01 Arch 2103**Full Marks : 60
Time : 03 Hours

* Figures in the right margin indicate full marks.

Section-AThere are **four (04)** questions in this section. Answer any **three (03)** questions.

- Q.1 a) Briefly describe the importance of “Climate and Design” course for an architecture student. [L2; CLO 2] **04**
 b) How can you classify the diversified climatic patterns around the world? Find major reasons of this diversity. [L4; CLO 1] **06**
- Q.2 a) Evaluate four major natural variables of thermal comfort and explain any one of them portraying its relationship with thermal comfort. [L5; CLO 4] **05**
 b) Identify the personal variables of thermal comfort in terms of their effectivity. [L3; CLO 4] **05**
- Q.3 a) Draw a Bio-climatic chart and show how does it assess thermal comfort condition of an area. [L4; CLO 4] **06**
 b) Draw a “Wind Frequency Graphs” and Explain how one should interpret it. [L5; CLO 2] **04**
- Q.4 A 6m x 6m and 3m high room is located on an intermediate floor with southern wall exposed to outdoor $T_o = 36^\circ \text{C}$. Its indoor temperature maintains same $T_i = 25^\circ \text{C}$ with adjoining rooms. South wall has a 4m wide full floor height single glazed window ($U=4.5 \text{ W/m}^2\text{degC}$) and the rest has 250 mm clinker wall ($U=1.2 \text{ W/m}^2\text{degC}$). Ventilation rate is 4 air change/hour here. 2 persons are working (120 W each) on computers (140 W each) under 1 tube light (30 W) and 2 ceiling fans (90 W each)
 Here,
 Incident radiation $(I) = 640 \text{ W/m}^2$
 Absorbance of the wall surface $\alpha = 0.4$
 Surface conductance $f_o = 8 \text{ W/m}^2\text{degC}$
 Solar gain factor for window $\theta = 0.8$
 Now calculate the heat flow rate of this room and suggest electro-mechanical solution to keep thermal balance (if needed). [L6; CLO 3] **10**

Section-BThere are **four (04)** questions in this section. Answer any **three (03)** questions.

- Q.1 Compare Passive design strategies that address various physiological objectives for climatic comfort in buildings located in hot-dry and warm-humid climatic zones. [L4; CLO 5] **10**
- Q.2 Draw the horizontal and vertical shading device in both the plan and section of a window (width 10'-0" and height 7'-0"), facing the southwest direction. Calculate the projection on the date 22nd April; time: 02:00 PM. Follow the attached sun-path diagram. [L6; CLO 6] **10**
- Q.3 Write a short note on the following points about their role in passive climatic control: **05X02 =10**
 a) Angle of Incidence
 b) Stack Effect [L2; CLO 5]
- Q.4 Outline appropriate architectural design solutions with neat sketches regarding the problems that are usually produced by precipitation in our monsoon context. [L2; CLO 7] **10**

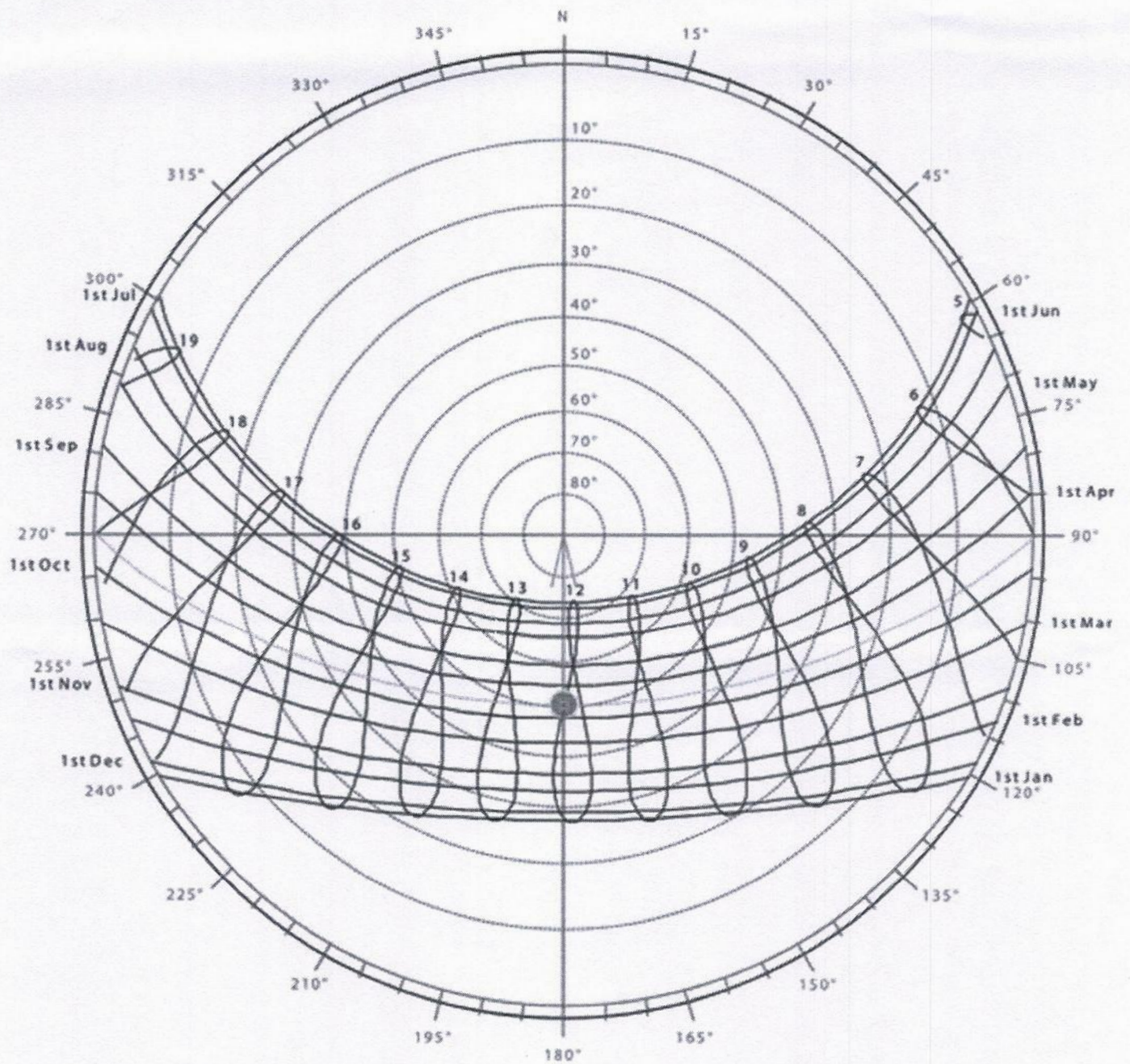


Fig: Sunpath Diagram of Bangladesh

Title of the Course : **Climate and Design**
 Course No: **Arch 2141**

Full Marks : 60
 Time : 03 Hours

* Figures in the right margin indicate full marks.

Section-A

There are **four (04)** questions in this section. Answer any **three (03)** questions.

- Q.1 a) Briefly describe the importance of “Climate and Design” course for an architecture student. 04
 b) How can you classify the diversified climatic patterns around the world? Find major reasons of this diversity. 06
- Q.2 a) Evaluate four major natural variables of thermal comfort and explain any one of them portraying its relationship with thermal comfort. 05
 b) Identify the personal variables of thermal comfort in terms of their effectivity. 05
- Q.3 a) Draw a Bio-climatic chart and show how does it assess thermal comfort condition of an area. 06
 b) Draw a “Wind Frequency Graphs” and explain how one should interpret it. 04
- Q.4 A 6m x 6m and 3m high room is located on an intermediate floor with southern wall exposed to outdoor $T_o = 36^\circ \text{C}$. Its indoor temperature maintains same $T_i = 25^\circ \text{C}$ with adjoining rooms. South wall has a 4m wide full floor height single glazed window ($U=4.5 \text{ W/m}^2\text{degC}$) and the rest has 250 mm clinker wall ($U=1.2 \text{ W/m}^2\text{degC}$). Ventilation rate is 4 air change/hour here. 2 persons are working (120 W each) on computers (140 W each) under 1 tube light (30 W) and 2 ceiling fans (90 W each) 10
- Incident radiation $(I) = 640 \text{ W/m}^2$
 Absorbance of the wall surface $a = 0.4$
 Surface conductance $f_o = 8 \text{ W/m}^2\text{degC}$
 Solar gain factor for window $\theta = 0.8$
- Now calculate the heat flow rate of this room and suggest electro-mechanical solution to keep thermal balance (if needed).

Section-B

There are **four (04)** questions in this section. Answer any **three (03)** questions.

- Q.1 Compare passive design strategies that address various physiological objectives for climatic comfort in buildings located in hot-dry and warm-humid climatic zones. 10
- Q.2 Draw the horizontal and vertical shading device in both the plan and section of a window (width 10'-0" and height 7'-0"), facing the southwest direction. Calculate the projection on the date 22nd April; time: 02:00 PM. Follow the attached sun-path diagram. 10
- Q.3 Write a short note on the following points about their role in passive climatic control: 05X02 =10
 a) Angle of Incidence
 b) Stack Effect
- Q.4 Outline appropriate architectural design solutions with neat sketches regarding the problems that are usually produced by precipitation in our monsoon context. 10

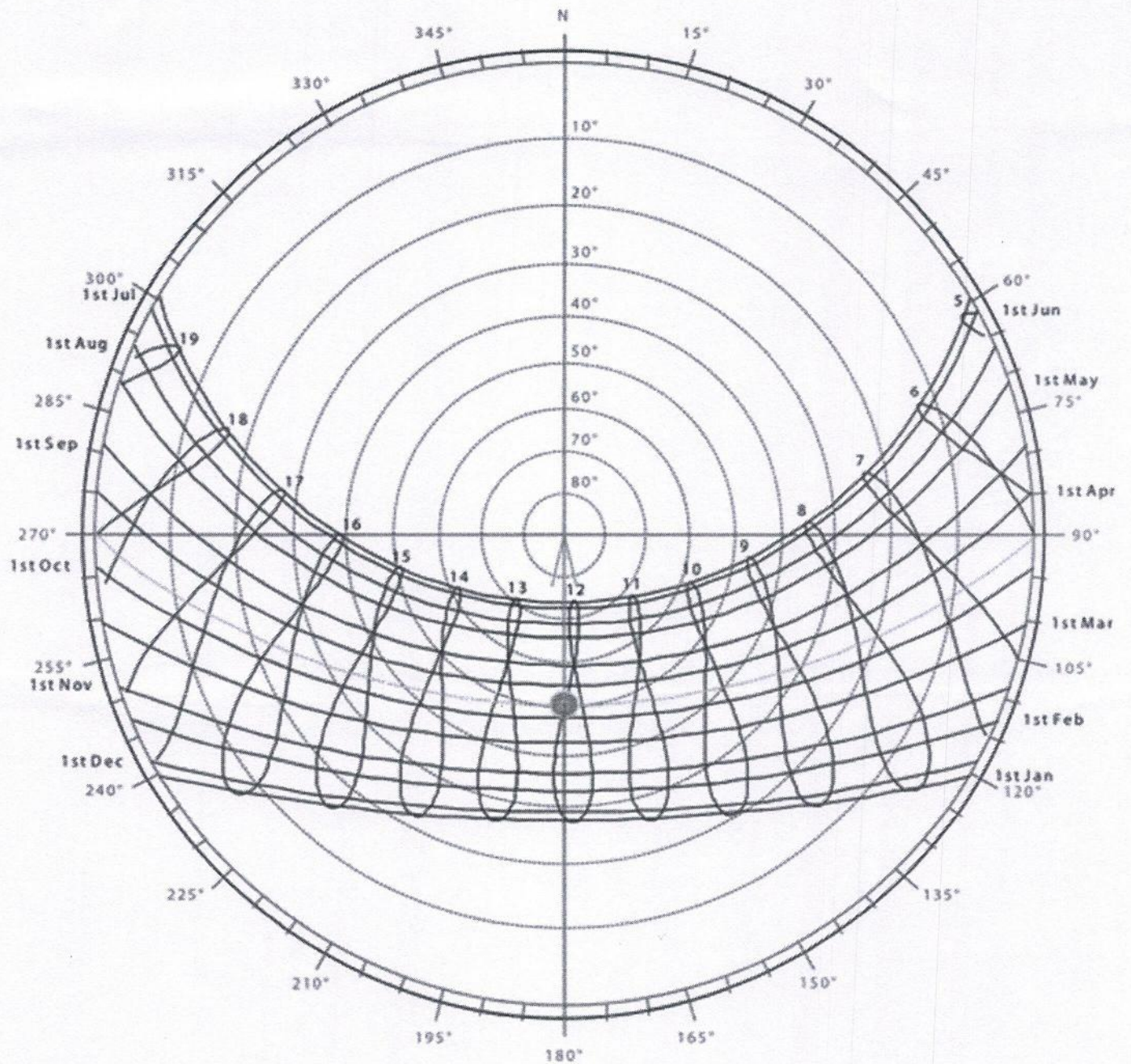


Fig: Sunpath Diagram of Bangladesh

Title of the Course : **Structure I**
Course No: **0732 01 CE 2151**

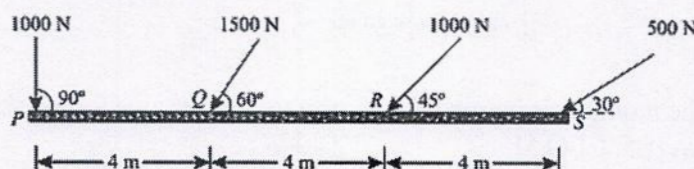
Full Marks : 60
Time : 03 Hours

* Figures in the right margin indicate full marks.

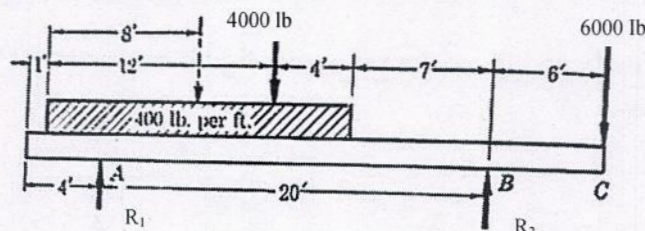
Section-A

There are **four (04)** questions in this section. Answer any **three (03)** questions.

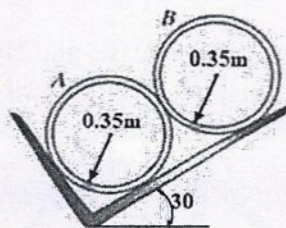
- Q.1 a) Explain the term Engineering Mechanics in your own words and describe its importance in architectural design and construction. [L3; CLO 1] **03**
b) Differentiate between roller, hinged, and fixed supports based on their movement restrictions and reaction forces. [L4; CLO 1] **02**
c) A horizontal line PQRS is 12 m long, where PQ = QR = RS = 4 m. Forces of 1000 N, 1500 N, 1000 N and 500 N act at P, Q, R and S respectively with downward direction. The lines of action of these forces make angles of 90°, 60°, 45° and 30° respectively with PS. Find the magnitude, direction and position of the resultant force. [L4; CLO 1] **05**



- Q.2 a) A uniform wheel of 600 mm diameter, weighing 5 kN rests against a rigid rectangular block of 150 mm height as shown in Figure. Find the least pull, through the centre of the wheel, required just to turn the wheel over the corner A of the block. Also find the reaction on the block. Take all the surfaces to be smooth. [L6; CLO 1,2] **05**
b) A simple beam is loaded as shown in figure below. Determine (a) the reactions R₁ and R₂ and (b) the bending moment at the support B. [L5; CLO 2] **05**



- Q.3 a) Summarize the important properties of a couple and discuss their significance in engineering mechanics. [L5; CLO 2] **03**
b) Describe the step-by-step procedure for drawing a Free Body Diagram with a simple structural example. [L3; CLO 2] **03**
c) Two smooth pipes, each having a mass of 300kg, are supported by the forked tines of the tractor. Draw the F.B.D for each pipe and both pipes together. [L5; CLO 1] **04**



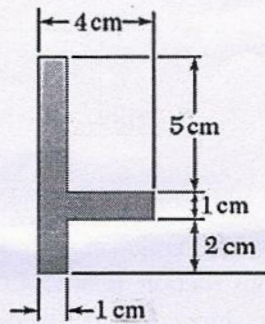
- Q.4 a) Define the term limiting frictional force and explain the condition under which it occurs. [L2; CLO 3] **03**
b) Illustrate the relationship between the coefficient of friction and the angle of friction using a simple diagram. [L2; CLO 3] **02**
c) A 400 lb block is resting on a rough horizontal surface for which the coefficient of friction is 0.40. Determine the force P required to cause motion to impend if applied to the block (a) horizontally or (b) downward at 30° with the horizontal. (c) What minimum force is required to start motion? [L5; CLO 3] **05**

Section-B

There are **four (04)** questions in this section. Answer any **three (03)** questions.

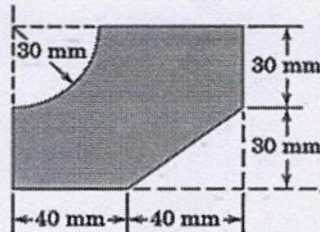
- Q.1 a) Locate the centroid of the shaded area shown below. [L6; CLO 5]

04



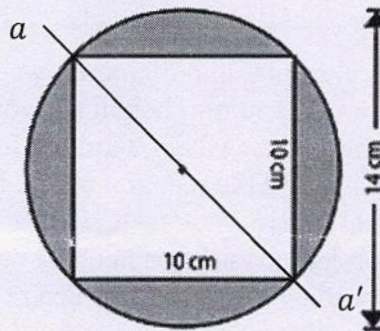
- b) Determine the location of the centroid of the shaded area given below. [L5; CLO 5]

06



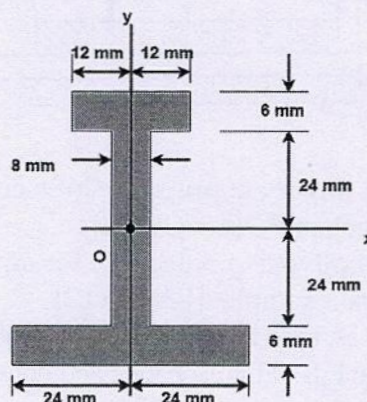
- Q.2 a) Determine the moment of inertia with respect to $a - a'$ axis for the shaded area shown below. [L5; CLO 5]

05



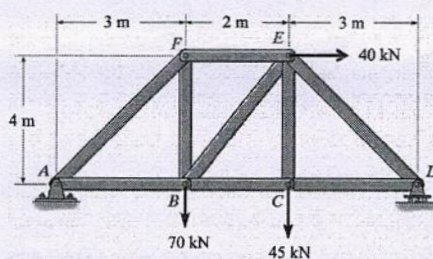
- b) Determine I_x and I_y of the following figure below. [L6; CLO 5]

05



- Q.3 Calculate the forces in the members FE, BE and BC of the following truss. Mention whether they are in tension or compression. [L4; CLO 4]

10



- Q.4 (a) A cable is suspended between two points on the same level with a span of 500 ft and a sag of 50 ft. If the load is 3 lb/ft, uniformly distributed horizontally, find
 i) the tension in the cable at the low point, ii) the maximum tension, iii) the slope of the cable at the supports, and iv) calculate the sag if the span is 400 ft and the load remains the same. [L6; CLO 4]

2.5X4
=10

Title of the Course : Vernacular Architecture Around the World
Course No: Arch 2161

Full Marks : 60
Time : 03 Hours

* Figures in the right margin indicate full marks.

Section-AThere are **four (04)** questions in this section. Answer any **three (03)** questions.

- Q.1 How does vernacular architecture influence the creation of a more context-sensitive built environment? **10**
- Q.2 Evaluate how the tropical climatic conditions of Bangladesh influence the formation and characteristics of vernacular architecture within the local context. **10**
- Q.3 Explain, with an example, how socio-cultural factors shape vernacular architecture as a cultural phenomenon. **10**
- Q.4 a) Identify the influence of local construction methods, materials, and technology on the formation of vernacular spaces and forms. **05**
b) Explain the chemistry of political and social views to accommodate the vernacular practices in Bangladeshi context. **05**

Section-BThere are **four (04)** questions in this section. Answer any **three (03)** questions.

- Q.1 Being an architecture student explain how the knowledge of vernacular architecture in your own context will help you to achieve sustainability in contemporary architectural practice. **10**
- Q.2 Describe the key attributes of the vernacular environment that shape the architectural identity of rural Bangladesh. **10**
- Q.3 "The traditional Bengali hut and the climatic adaptations that it embodied provided the model for the British bungalow." Do you agree with the statement? Justify your position with proper examples. **10**
- Q.4 Critically assess the harmonization between climate and planning of typical *Yazdi* houses in order to achieve highly energy-efficient solutions for extreme climatic conditions. **10**

Title of the Course : **Principles of Construction**
Course No: **CE 2151**

Full Marks : 60
Time : 03 Hours

* Figures in the right margin indicate full marks.

Section-A

There are **four (04)** questions in this section. Answer any **three (03)** questions.

- Q.1 a) What is bond in brickwork? Compare English bond and Flemish bond of bricks with neat sketches. **05**
b) To be damp-proof, how can you treat the floors and walls? Discuss with neat sketch. **05**
- Q.2 a) What is the role of a pile cap in pile foundation? Explain with neat sketch. **05**
b) Draw a combined footing. At what circumstances would you choose a combined footing for construction? **02+03 =05**
- Q.3 a) What is a cavity wall? Draw a neat sketch of a cavity wall. For what reasons would you choose a cavity wall in a building? **01+02+04 =07**
b) Why is it important to maintain an optimum water-cement ratio during concrete casting? **03**
- Q.4 a) For what benefits would an architect choose cladding on the external surface of a building? **04**
b) What is the role of paint in a building? How would you figure out if a paint is of good quality? **02+04 =06**

Section-B

There are **four (04)** questions in this section. Answer any **three (03)** questions.

- Q.1 Create detailed sketches of different types of staircases and provide an elaborate description of their features. Discuss the advantages, disadvantages, and specific design requirements for each type. **10**
- Q.2 Sketch the Methods of treating expansion joint of roof. What is the difference between contraction joint and construction joints. **10**
- Q.3 List the factors influencing the choice of flooring materials. Categorize the various types of floor finishes and explain the properties and applications of each type. **10**
- Q.4 What are the essential components of a green roof? Draw a spot section of a modern green roof showing the detailed design in the sequential layers of the roof system. **10**

Title of the Course : **Philosophy**

Full Marks : 60

Course No: **0223 01 Hum 2183**

Time : 03 Hours

* Figures in the right margin indicate full marks.

Section-AThere are **four (04)** questions in this section. Answer any **three (03)** questions.

- Q.1 Define philosophy. Describe the scope or subject-matter of philosophy. **04+06=10**
- Q.2 What is science? Write down the relation between philosophy and science. **03+07=10**
- Q.3 Show the difference between deductive and inductive philosophy. **05+05=10**
Analyze the role of inductive philosophy in architectural process.
- Q.4 Define cause. Distinguish between cause and condition. **03+07=10**

Section-BThere are **four (04)** questions in this section. Answer any **three (03)** questions.

- Q.1 What is architecture? Explain the relationship between architecture and philosophy? **04+06=10**
- Q.2 Explain the formalism and anti-formalism debate about philosophy. **10**
- Q.3 What is hypothesis? Explain the importance of hypothesis in Architecture. **04+06=10**
- Q.4 Describe the value of critical thinking in architecture. **10**