L-2/T-2/ARCH **Date : 08/12/2014**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

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

Sub : **CE 267 (CE 225)** (Structure II : Basic Mechanics of Solids)

Full Marks : 140 Time : 3 Hours

The figures in the margin indicate full marks.

USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – A

There are **SEVEN** questions in this Section. Answer any **FIVE**.

Assume any reasonable value of missing data.

1. Draw shear force and bending moment diagrams for the simply supported beam loaded as shown in Figure 1. **(14)**

2. Draw shear force and bending moment diagrams for the beam loaded as shown in Figure 2. **(14)**

3. Draw shear force and bending moment diagrams for the frame loaded as shown in Figure 3. **(14)**

4. (a) Write down advantages and disadvantages of welded joints over riveted joints. **(6)**

   (b) Design and detail the welded end connections required to transmit a dead-load force of 100 kips and a live-load force 250 kips through two C 10 × 30 to a 1-inch gusset plate as shown in Figure 4. All material is A 36 (F_y = 36 ksi). Welds are to be deposited manually using E 60XX electrodes. Use AISC/ASD. **(8)**

5. (a) Describe briefly with neat sketches the most important defects arising from improper welding technique. **(8)**

   (b) Determine the capacity of the welded connection as shown in Figure 5. Use E70XX electrode and AISC/ASD method. **(6)**

6. (a) Classify the types of riveted joints with neat sketches. **(6)**

   (b) Determine the bolt diameter (d) and pitch of the bolts (p) for a double riveted lap joint as shown in Figure 6 for MS plate thickness (t) of 9.5 mm each. The permissible stresses are: tension = 90 MPa, shearing = 75 MPa, and bearing = 150 MPa. **(8)**

7. (a) Describe briefly with neat sketches the different types of failure in a riveted joint. **(8)**

   (b) For the bolted connection as shown in Figure 7, compute for a force of P = 120 kips: (i) the nominal shear stress in the bolts (ii) the nominal bearing stress between the bolts and the plates. Given : diameter of the bolt = 1 inch. **(6)**

Contd P/2

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SECTION – B

There are **SEVEN** questions in this Section. Answer any **FIVE**.

8. (a) Define modulus of elasticity, modulus of resilience and modulus of rupture. **(6)**

   (b) Draw a qualitative stress strain diagram of an elastic material showing upper yield stress, lower yield stress, ultimate stress and breaking stress. **(8)**

9. (a) Define shear stress. What is the difference between single shear and double shear? **(4)**

   (b) In the double bolted butt joint shown in Fig. 8, determine the unit shearing stresses in the bolts. Given bolt diameter = 7/8 inch. **(10)**

10. (a) Explain following terms with figures. **(6)**

    (i) Strain Hardening

    (ii) Necking

    (b) What is the difference between ductile and brittle materials? Give examples of these materials. **(4)**

    (c) What is proof strength? Show graphically how proof strength of an anisotropic material can be found. **(4)**

11. (a) Define normal force and normal stress. **(2)**

    (b) What are the equations of equilibriums? **(2)**

    (c) A circular rod with diameter 20 mm and length 500 mm is subjected to a tensile force of 45 kN. Modulus of elasticity of the material is 200 kN/mm^2. Find stress, strain and elongation of the bar due to applied load. **(10)**

12. (a) What is thermal strain? Explain with figure. **(4)**

    (b) A circular bar has a diameter of 10 mm. The length of the bar is 100 mm. coefficient of thermal expansion is 0.00065 per degree Celsius. If temperature increases by 2°C, determine the length change. **(10)**

13. Find the stress in the mast of derrick shown in Fig. 9. All members are in the same vertical plane and are joined by pins. The mast is made from a 20 cm standard steel tube weighing 25 kg/m. Neglect the weight of the members. I and A of 20 cm standard steel tube are 2250 cm^4 and 40 cm^2 respectively. **(14)**

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14. Consider the rod of constant cross sectional area A and Length L shown in Fig. 10. Determine the relative displacement of end A with respect to B when a force P is applied; i.e. find the deflection of the free and caused by the application of a concentrated force P. The elastic modulus of material is E. **(14)**

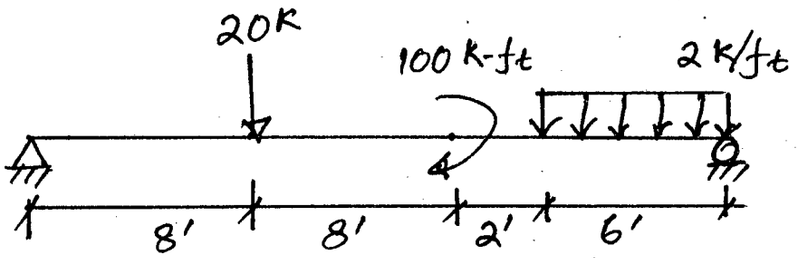

Figure 1

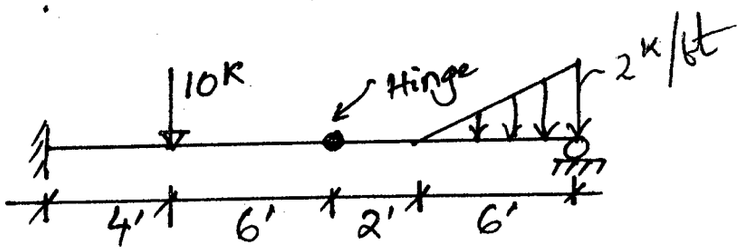

Figure 2

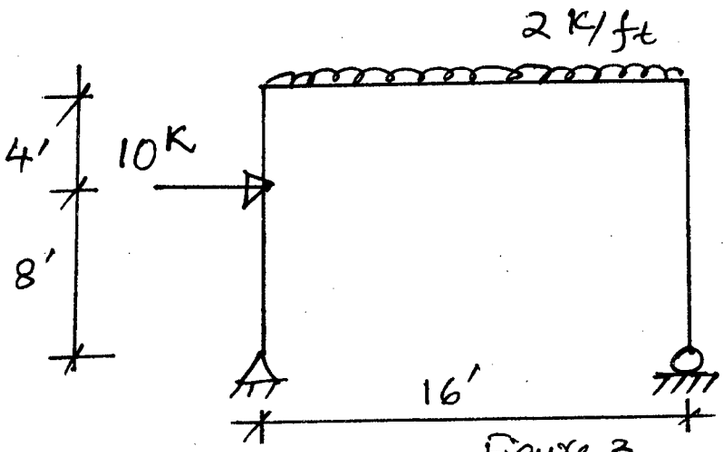

Figure 3

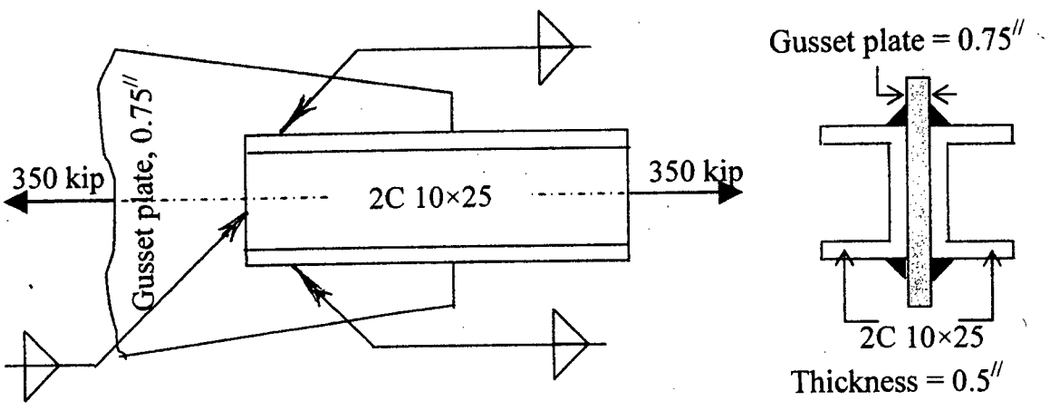

Figure 4

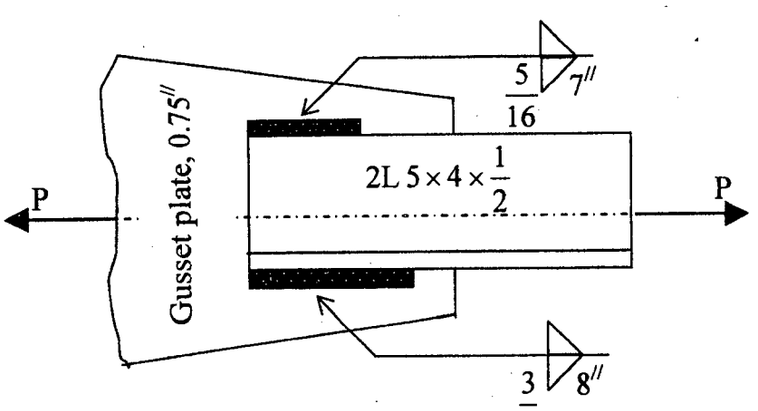

Figure 5

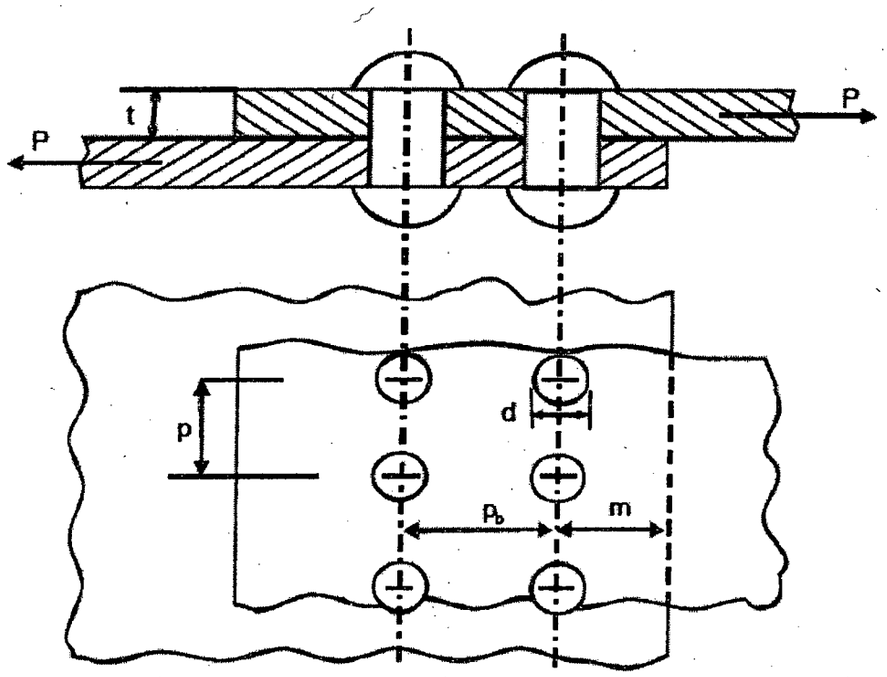

Figure 6

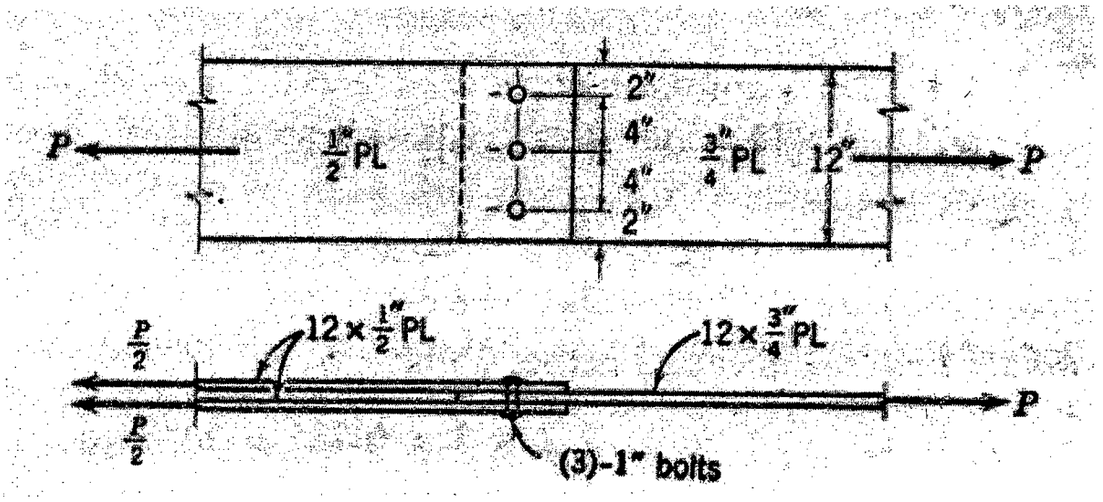

Figure 7

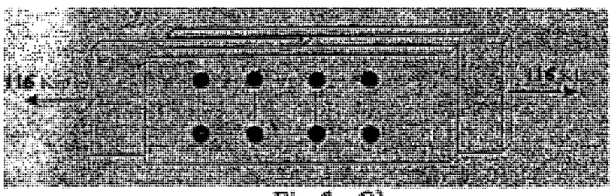

Fig 8

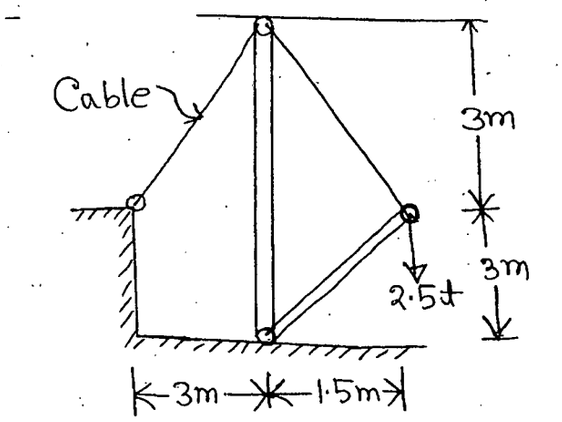

Fig 9

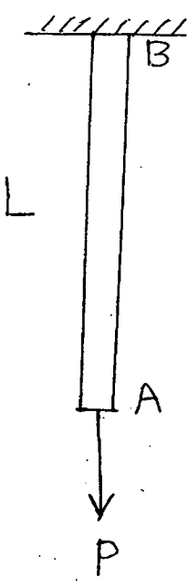

Fig 10

L-2/T-2/ARCH **Date : 15/12/2014**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

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

Sub : **CE 231 (CE 271)** (Building Services I Plumbing)

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) Where and why Septic Tanks are required? Using a diagram show the different components of a Septic tank with a Soak pit. Design a Septic Tank for a six storied residential building where 60 people reside. Assume necessary values of parameters as needed. **(17 ⅓)**

   (b) List the components of a water supply system in a zone where the supply is dependent on surface water. Show the components in a schematic diagram. **(6)**

2. In a six storied apartment building in Dhaka, the ground floor is designed for parking vehicles while the other five floors are used for residential purpose. Each floor area is 1000 sft and there is only one toilet per floor. Design the underground reservoir, roof tank and the pump for the building. Clearly mention the assumptions. Provide necessary drawing of the piping systems. **(23 ⅓)**

3. (a) List the broad categories of domestic purpose where water is used. **(3 ⅓)**

   (b) List the factors on which the per capita water consumption depends. Explain how these factors influence the consumption rate. **(10)**

   (c) Explain the following two methods of population projections: (i) Uniform growth rate method and (ii) Graphical extension method. **(10)**

4. (a) What is Pour Flush Latrine? Explain the design considerations of Pour Flush Latrine. **(6)**

   (b) Draw a neat sketch of Twin Pit Waterseal Pour Flush Latrine and Label the components. **(11 ⅓)**

   (c) What are the advantages and disadvantages of Pour Flush Latrine? **(6)**

Contd P/2

CE 231(ARCH)

SECTION – B

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

5. (a) What do you mean by "Plumbing System"? What is the difference between storage tank and flushing cistern? What is "cross-connection"? **(6)**

   (b) Differentiate between "self siphonage" and "induced siphonage". How will you prevent the siphonage of a water seal? **(5)**

   (c) Why is storage tank required in buildings? List the factors to be considered in determining the capacity of a storage tank. **(6)**

   (d) How will you ensure the non-contamination of water supply in a building? **(6⅓)**

6. (a) Define "Trap". What are the features of good traps? Classify traps. **(9)**

   (b) Explain with a diagram the mechanism of the bell type flushing cistern. **(7⅓)**

   (c) State the functions of soil pipe, waste pipe, and vent pipe. **(3)**

   (d) Define "fixture unit". How will you determine the fixture unit value of a fixture? **(4)**

7. (a) State the design approach of a plumbing professional. **(10)**

   (b) Show the components of a house water connection in a neat sketch and state the functions of the components. **(13⅓)**

8. (a) Describe briefly the principal plumbing systems of drainage. Which system do you prefer and why? Explain. **(12⅓)**

   (b) List the requirements of a building drainage system. **(6)**

   (c) What are the functions of manholes? Where will you place a manhole? **(5)**

L-2/T-2/ARCH **Date : 11/01/2015**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

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

Sub : **ARCH 233** (Landscape 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 Q. No. **1** and any **TWO** from the rest.

1. Write notes on : **(15×2=30)**

   (a) Features of Mughal Garden

   (b) Italian garden of Renaissance and Late Renaissance period.

2. (a) Define Landscape Design. Mention the objectives of Landscape design. **(5)**

   (b) Mention the scope and domain of Landscape Planning. **(7)**

   (c) Why is it necessary for planners to learn about Landscape design and planning? **(8)**

3. (a) "Ecosystems are complex adaptive systems" - explain with examples. **(10)**

   (b) Explain how an ecosystem can function as a whole. **(10)**

4. "A planner needs to know about Bio-diversity in order to design high-functioning landscape" - Explain. **(20)**

SECTION – B

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

5. (a) Define landscape conservation. State the key elements of landscape conservation. **(5)**

   (b) State the landscape conservation principles. **(5)**

   (c) Define-'Ecosystem based conservation planning'. **(8)**

   (d) Critically discuss the importance of 'Community-based conservation' in regional planning level. **(12)**

6. (a) State the important site considerations during landscape planning process. **(12)**

   (b) Mention the steps of the planning process. **(8)**

7. (a) What is planting? What are the steps involved in planting? **(12)**

   (b) State the factors that distinguish the planting season. **(8)**

8. (a) Write short notes on: **(10×2=20)**

   (a) Eco-System Services

   (b) Eco-System of Sal-forest.

L-2/T-2/ARCH **Date : 06/01/2015**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

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

Sub : **ARCH 243** (Art and Architecture (III)

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) What are the contributions made by the 'Asokan School of Art and Architecture? What is the purpose of a monolithic pillar with its 'wheel of order'? **(6⅓)**

   (b) Describe the development of Sonehi Stupa after its re-construction made by Surgas and Andhras in plan, elevation and section. How the scale seems to be negotiated after the enveloping was done? **(17)**

2. (a) Explain how the trends of Hellenstic art found its way to the Buddhist monasteries of India. **(6⅓)**

   (b) Describe the plan and three dimensional features of the monastic sanctuary at Takht-i-Bahai with its (a) Stupa court (b) monastery-proper (c) terrace. **(17)**

3. (a) Explain the gradual process of formation of the Buddhist Chaitya halls and monasteries developed in Ellora and Ajanta hills. **(7⅓)**

   (b) How the rock-cut Chaitya halls were executed? Describe with neat sketches two of the following Chaitya halls: **(16)**

   (i) Ajanta (ii) Kondore (iii) Konheri

4. Write short notes on: **(23⅓)**

   (a) The Shiva of Buddha Goya

   (b) Rani Gurpha

   (c) Deogarh Temple at Jansi

SECTION – B

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

5. (a) Mention the fire periods Dravidian Style. **(5)**

   (b) "Owing to its unusual position the plan of Shore Temple is not according to custom" - describe the underlying ideas in its plan and development. Explain why the system of shallow cisterns were introduced in the temple plan. **(10)**

   (c) Draw the plan and sectional sketch of Vaikuntha Perumal at Kanchipuram and identify its special feature that are distinctly different from other temples of Pallava Style. **(10)**

Contd P/2

ARCH 243

6. (a) Mention how the Orissan Indo-Aryan temples are resolved according to their periods. **(5)**

   (b) Identify with neat sketches the basic difference (in plan and 3-d volume) between the Indo-Aryan style of Orissa and Khajuraho. **(10)**

7. (a) What are the principal architectural features of the temple? What are the two distinct styles (designated by Fergusson) of the temple architecture in India. **(5)**

   (b) "Kandariya Mahadeo is considered to be the "fully formed and co-ordinated temple structure of Khajuraho"-Explain. **(10)**

8. (a) 'Except for its impressive proportions the architectural effect of Jagannath temple at Puri si disappointing' - Explain after Percy Brown why it is said so. **(8)**

   (b) Critically evaluate how the supplementary structures added later erected inconsistency in its massing in Ligaraja temple. **(7)**

9. Illustrate and describe in details the Great temple at Madura, why it is called a double temple? How its visual aspects have been largely influenced by the water tank. **(15)**

L-2/T-2/ARCH **Date : 11/01/2015**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

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

Sub : **ARCH 253** (Design Theory II)

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 sort notes on the following. **(2×15=30)**

   (a) Articulation of form.

   (b) L-shaped vertical plane as space defining element.

2. Describe Plane as primary element in architecture. **(20)**

3. Explain, with sketches the reasons for formal collision of geometry. **(20)**

4. Describe the different types of additive form with example and sketches. **(20)**

SECTION – B

There are **FOUR** questions in this Section. Answer Q. No. **8** and any **TWO** from the rest.

5. Discuss the types of opening that can be introduced in space defining elements. **(20)**

6. Describe the following spatial relations briefly **(10×2=20)**

   (a) space within a space

   (b) Adjacent spaces

7. Discuss the deferent types of space organizing principles with sketches. **(20)**

8. Write short notes on the following. **(15×2=30)**

   (a) Golden Section

   (b) Scale

L-2/T-2/ARCH **Date : 16/01/2015**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

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

Sub : **ARCH 237** (Environment and Design III : Design in the Tropics)

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 two from the following: **(2×10)**
   (a) Earth Cooling
   (b) Thermal Inertia
   (c) Roushaan

2. Discuss in detail environmental heat sinks to provide cooling. **(25)**

3. Write a short note on the 'Design of Openings' and illustrate five types of external shading devices with sketches. **(25)**

4. Explain environmental design process and discuss the role of simulation tools in early design stage. **(25)**

SECTION – B

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

5. Differentiate between: **(2×10=20)**
   (a) Courtyards in warm-humid and hot-dry climates.
   (b) Regulatory mechanisms of the human body during hot and cold conditions.

6. Discuss the variables of thermal comfort. Elaborate on the Heat Balance Equation. **(25)**

7. Distinguish in details between shelters in hot-day and Composite Climates in terms of form and planning, construction materials and opening characteristics. **(25)**

8. What are the various heat exchange mechanisms of a building? Discuss passive architectural means that can be used to keep buildings from gaining heat in Bangladesh. **(25)**

L-2/T-2/ARCH Date : 16/01/2015

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

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

Sub : **HUM 119** (Psychology)

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 **TRHEE**.

1. (a) What are the goals of psychology? **(6)**

   (b) Discuss the major perspectives of psychology. **(17 ⅓)**

2. (a) What is the difference between sensation and perception? **(6)**

   (b) How do we organize our perception? **(17 ⅓)**

3. (a) What are the sources of frustration? **(6)**

   (b) Describe Maslow's hierarchy of needs approach to motivation. **(17 ⅓)**

4. (a) Define Emotion. **(6)**

   (b) What are the types of emotion? Discuss in detail. **(17 ⅓)**

SECTION – B

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

5. (a) What are the three major aspects in the definition of learning? **(6)**

   (b) Discuss different types of reinforcements and Punishments with appropriate examples. **(17 ⅓)**

6. (a) What are the different types of long-term memory? **(6)**

   (b) Why do we forget? Justify your answer with illustrations. **(17 ⅓)**

7. (a) How can intelligence be measured? **(6)**

   Describe the classification of intelligence. **(17 ⅓)**

8. (a) What do you mean by Personality? **(6)**

   (b) Delineate the trait theory of Personality. **(17 ⅓)**
