

SECTION - A

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

1. (a) Draw axial force, shear force and bending moment diagram for the beam shown in Figure 1. **(14)**
2. Draw shear force and bending moment diagrams for the beam shown in Figure 2. **(14)**
3. Draw shear force and bending moment diagram for the frame shown in Figure 3. **(14)**
4. Draw shear force and bending moment diagram for the cantilever beam shown in Figure 4. **(14)**
5. What is factor of safety? Draw typical stress-strain diagrams for ductile material, brittle material, tougher material. Differentiate between elastic, plastic and viscoelastic materials. **(14)**
6. For the bracket shown in Figure 5, determine the standard size of fillet weld required. Use AISC allowable stresses. **(14)**
7. Determine the bearing stresses caused by the applied force at A, B and C for the structure shown in Figure 6. **(14)**

SECTION - B

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

8. The beam BE in figure 7(a) is used for hoisting machinery. It is anchored by two bolts at B, and at C it rests on a parapet wall. The essential details are given in the figure. Note that the bolts are threaded as shown in figure 7 (c) with $d = 16$ mm at the roof of the threads. If this arrangement is used to lift equipment of 1000 kg, determine the stress in the bolts BD and the bearing stress at C. Assume that the weight of the beam is negligible in comparison with the loads handled. **(14)**

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9. Find the stress in the mast of the derrick shown in the figure 8. 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 29.4 kg per m. Neglect the weight of the members. I and A of 20 cm standard steel tube are 2142 cm^4 and 37.6 cm^2 respectively. (14)
10. (a) Write down the expression for strain tensor. (5)
- (b) Consider the rod AB of constant cross-sectional area A and of length L shown in figure 9. Determine the relative displacement of the end A with respect to B when a force P is applied; i.e. find the deflection of the free end caused by the application of a concentrated force P . The elastic modulus of the material is E . (9)
11. A 7.5 cm by 10 cm, 1 mm thick, rectangular brass diaphragm is stretched between rigid frame made of Invar as shown in figure 10. If a drop in temperature of 100°C occurs, determine the resulting normal stress in the diaphragm. Assume that for the brass $E = 11.2 \times 10^5 \text{ kg/cm}^2$, $G = 4.2 \times 10^5 \text{ kg/cm}^2$, $\alpha = 22 \times 10^{-6} \text{ cm per cm per degree centigrade}$, whereas for Invar the co-efficient of thermal expansion is zero over the range of the temperature considered. (14)
12. If a load of 0.6 t is applied to a rigid bar suspended by three wires as shown in the figure 11, what force will be resisted by each wire? The outside wires are aluminium ($E = 70 \times 10^4 \text{ kg/cm}^2$). The inside wire is steel ($E = 21 \times 10^5 \text{ kg/cm}^2$). Initially there is no slack in wire. (14)
13. A building truss member consisting of two 8 in. 11.5 lb channel sections is to be connected to a $\frac{1}{2}$ in. Gusset plate as shown in figure 12. Using AISC specifications, determine the allowable axial load P and the number of $\frac{3}{4}$ in. rivets required for the connection. (14)
14. A $\frac{3}{4}$ in. thick bracket plate is fastened to a $\frac{7}{8}$ in. thick main plate as shown in figure 13. Using AISC allowable stresses, determine the required size of rivets when the angle α is 60° . Rivet sizes available are from $\frac{1}{2}$ to $1 \frac{1}{4}$ in. in $\frac{1}{8}$ in. increments. (14)
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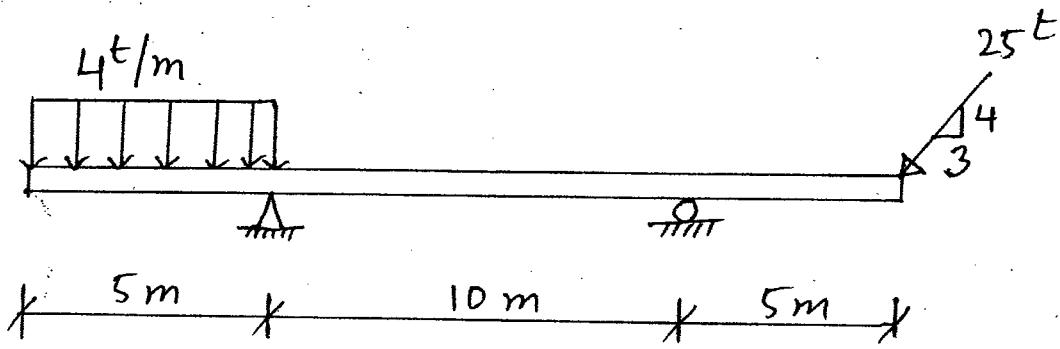


FIGURE . 1
(Question 1.)

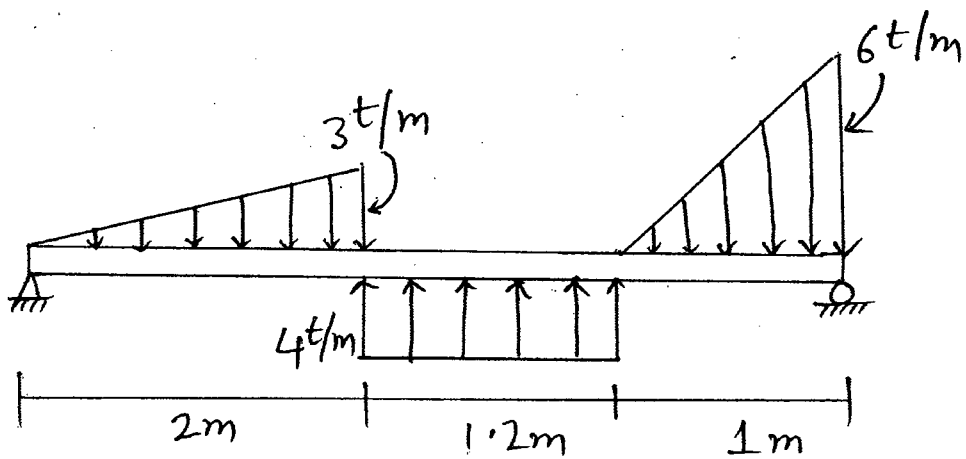


FIGURE . 2 (Question 2)

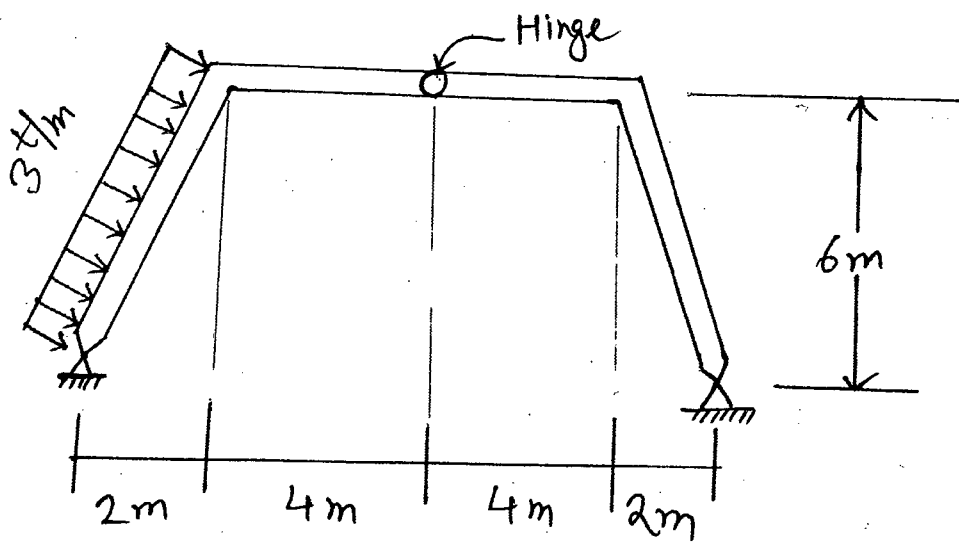


FIGURE . 3
(Question 3)

CE 267

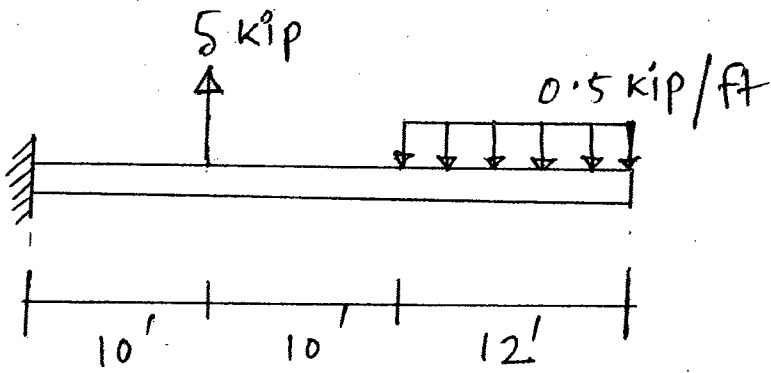


FIGURE. 4 (Question 4)

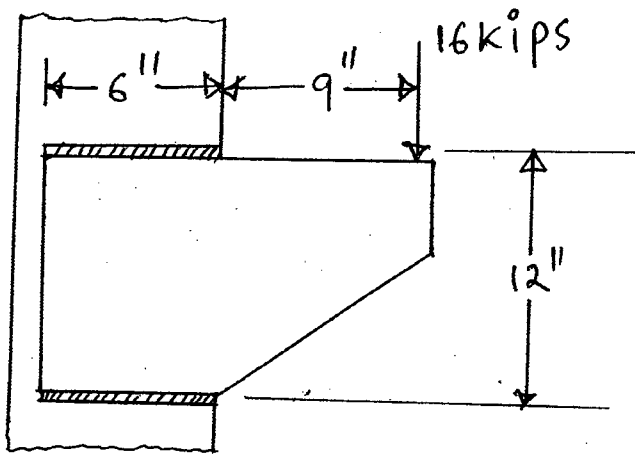


FIGURE. 5 (Question 6)

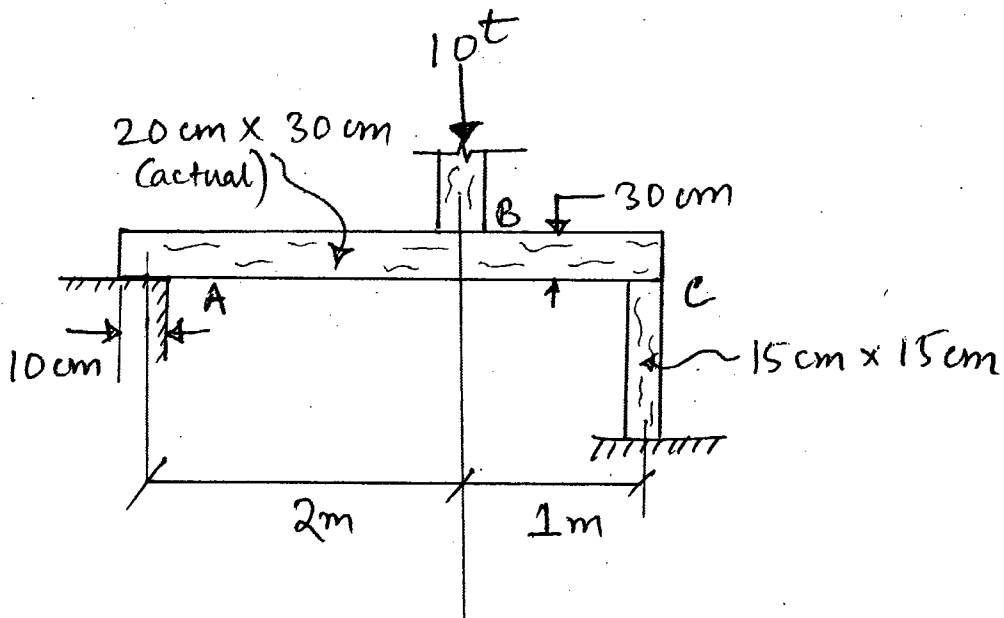
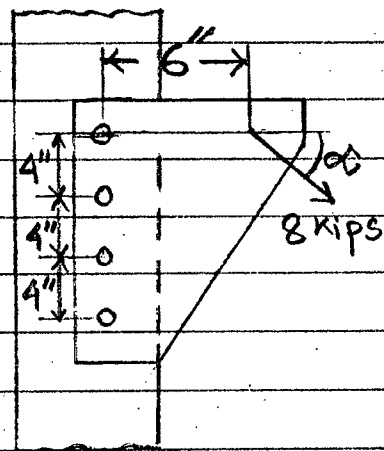
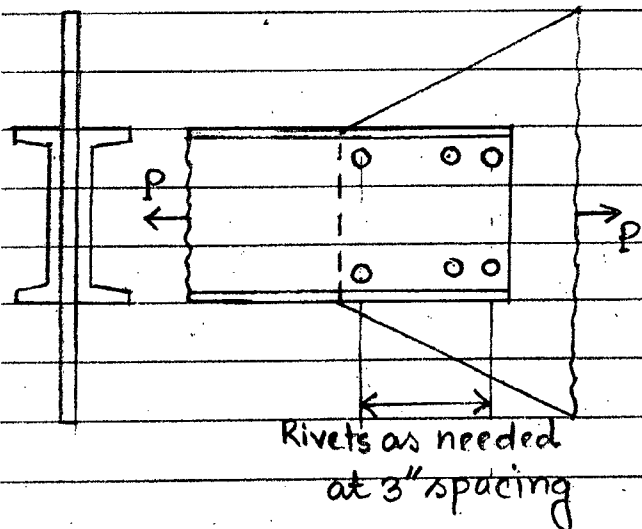
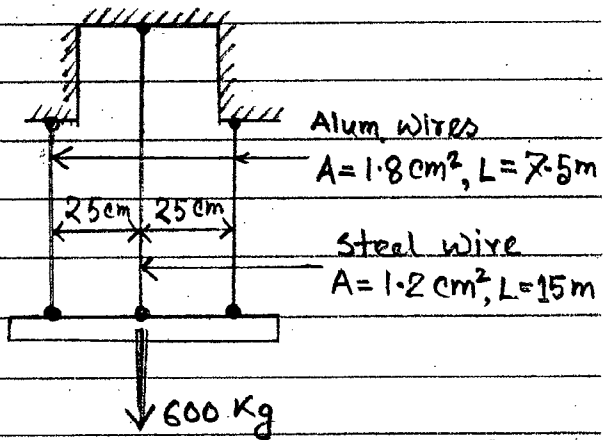
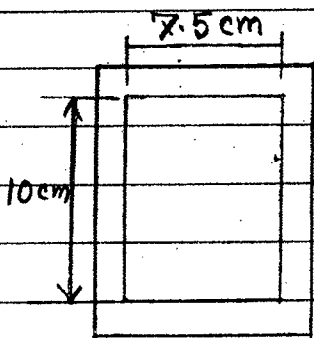
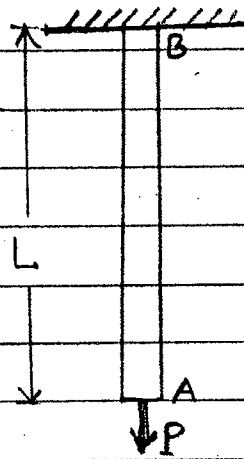
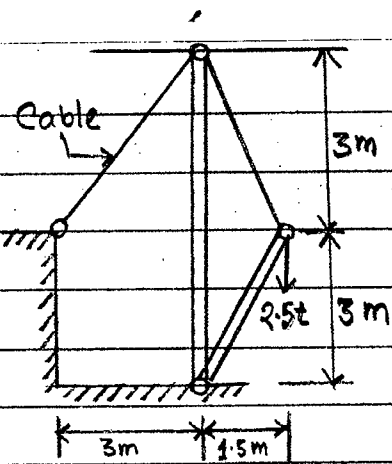
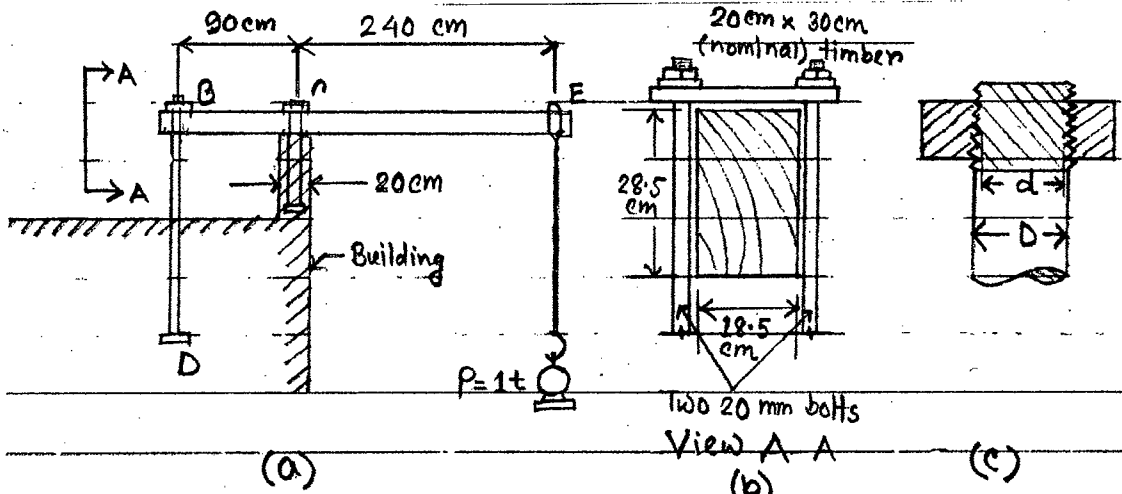


FIGURE. 6 (Question 7)



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L-2/T-2/ARCH

Date : 21/09/2013

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-2 B. Arch. Examinations 2011-2012

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 **THREE**.

1. (a) Why is psychology called a scientific study of behaviour and mental processes? (6)
(b) Describe different branches of psychology. (17 1/3)
2. (a) Define absolute threshold with appropriate examples. (6)
(b) Discuss the Gestalt law of perceptual organization. (17 1/3)
3. (a) Why do people get frustrated? (6)
(b) Explain different approaches to motivation. (17 1/3)
4. (a) Why is emotion necessary in our life? (6)
(b) Discuss the theories of emotion. (17 1/3)

SECTION – B

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

5. (a) What is learning? (6)
(b) Describe classical conditioning. (17 1/3)
6. (a) Show the Atkinson-Shiffrin's 3-stage model of memory. (6)
(b) What are the differences between short-term memory and long-term memory? (17 1/3)
7. (a) Define intelligence. (6)
(b) Discuss the different types of intelligence. (17 1/3)
8. (a) Differentiate id, ego and super-ego. (6)
(b) Explain the Big-five model of personality. (17 1/3)

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L-2/T-2/ARCH

Date : 22/07/2013

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-2 B. Arch. Examinations 2011-2012

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

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 any **THREE**.

1. What is a septic tank? Where and why is it 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 any reasonable value if required. (23 1/3)

2. (a) Classify traps according to their shapes. Provide sketches of different types of traps. (5 1/3)
(b) What is the indicator of the strength of a trap? Explain with a diagram. Why the strength of a trap is required? (9)
(c) What are the types of water closets used in Bangladesh? Explain the salient features of each of the types with diagrams. (9)

3. Show the following plumbing systems of drainage with diagrams: (23 1/3)
 - (i) Single Stack
 - (ii) One pipe system
 - (iii) Two pipe system
 - (vi) Partially ventilated one pipe system.Mention the advantages and disadvantages of each of the systems.

4. (a) What is "Staging" of roof top tank? Why is it needed? How can we ensure a conservative design of roof top tank staging? (7)
(b) List the various types of impurities in water and their effects? What are the basic requirements of drinking water? (8)
(c) What are the principles governing the design of water supply system in a building? (8 1/3)

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CE 231 (CE 271 NEW)

SECTION – B

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

5. (a) Which type of drainage plumbing system will you select for the following types of buildings: (i) 3-4 storied group housing, (ii) Multi-storied Hospital, (iii) 3-4 storied Hotels. Give reasons in favour of your selection. **(11 1/3)**
- (b) Explain the roles of the (i) plumbing contractor, (ii) plumber, and (iii) sanitary ware manufacturer for a successful plumbing work to be ensured. **(12)**
6. (a) Write short notes on: (i) Stack pipe, (ii) Branch pipe, (iii) Back Flow, (iv) Air gap. **(12)**
- (b) What are the factors on which the per capita water consumption depend? Explain each of the factors with examples in the context of Bangladesh. **(11 1/3)**
7. What is "Plumbing system" for buildings? What are the major components of it? What are the basic design objectives a professional must ensure in a plumbing system design? **(23 1/3)**
8. (a) Show the details of House Water connections with diagram and label the various components. Justify the rationale for inclusion of each of the components. **(8)**
- (b) Write short notes on (i) Sullage, (ii) Sewage, (iii) Night Soil, and (iv) Sewer. **(4)**
- (c) Why storage of water is required in a building? With a diagram show the components of a storage tank and explain functions of each. **(11 1/3)**
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L-2/T-2/ARCH

Date : 21/09/2013

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-2 B. Arch. Examinations 2011-2012

Sub : ARCH 237 (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. Answer any two of the following: **(2×10)**
 - (a) Use of climatic data and the 'Design Process' – discuss.
 - (b) Discuss 'airflow and openings' in the context of warm-humid climate.
 - (c) Draw an annotated section of a courtyard house of a hot-dry climate showing heat flows during day and night.

2. What is the basis of climatic classification of G. A. Atkinson? Name the major climatic zones and compare any two climatic zones in terms of 'sky condition'. **(25)**

3. Discuss regulatory mechanism of a human body and thermal balance. Use annotated diagrams where applicable. **(25)**

4. Narrate heat exchange of buildings using the equation of thermal balance and briefly discuss the most effective mode of heat loss of a building in your climatic context. **(25)**

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: **(2×10)**
 - (a) Wind catcher
 - (b) Heat sink
 - (c) Courtyard in Hot and Dry Climate

 6. Discuss briefly the design of openings and illustrate with diagram the advantage and disadvantage of common window type. **(25)**

 7. Illustrate with annotated sketches the sources of heat and method of preventing overheating. **(25)**

 8. Discuss form and planning of a shelter in context of the climate of Bangladesh. **(25)**
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L-2/T-2/ARCH

Date : 05/10/2013

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-2 B. Arch. Examinations 2011-2012

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

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. (a) Describe elaborately the key elements of Ashokan School of Architecture with sketches. (12)
(b) Discuss the architectural characteristics of the Muryan City of Patliputra as the finest example of Vedic City. (7)
2. (a) Briefly discuss the technique of Rock-cut Architecture with diagrams. (5)
(b) Explain with drawings the Chaitya Hall at Karli as it marks the culmination during the early phase (Hinayana phase) of rock-cut architecture. (12)
3. (a) State the significance of stupa and its early developments. (4)
(b) Elaborate the architectural characteristics of Great Stupa at Sanchi with reference to its reconstruction and expansion. (13)
4. (a) Discuss the development of viharas during the Mahayana phase of rock-cut architecture. (8)
(b) Describe the architectural developments of Takht-E-Bahi monastery. (9)
5. Write short notes on (any three) (17)
 - (a) Cave of Lomas Rishi
 - (b) Vedic village
 - (c) Frescoes of Ajanta
 - (d) Rani Gumpha

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ARCH 243

SECTION – B

There are **FIVE** questions in this section. Answer Q. No. 6 and any **THREE** from the rest.

6. (a) State the names of rathas of Mahabalipuram and briefly explain Dharmaraja Ratha. (7)
(b) Elaborate the architectural features of Shore Temple at Mahabalipuram. (7)
(c) "Chalukyan evolved an integrated plan" — explain in relation to Virupoksha Temple at Pattadakal. (5)
7. (a) Explain the architectural characteristic of Dravidian style in relation with the Great Temple at Tanjore. (12)
(b) "The temple becomes a fort and the fort becomes a city" — explain in relation with the development of the southern temple complexes. (5)
8. (a) State the architectural features and evolution of Gopuram as the gateway of temples. (7)
(b) Describe the temples of Madura complex, main shrines and other surroundings. (10)
9. (a) State with diagram the principal parts of a typical Orissan temple. (8)
(b) Elaborately discuss with sketches the architectural characteristics of Great Lingaraja temple at Bhubaneshwar. (9)
10. Write short notes on: (17)
(a) Gupta order
(b) Ladhkhan Temple
(c) Vastupurushamandala
(d) Three period of Orissan temple.
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L-2/T-2/ARCH

Date : 28/09/2013

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-2 B. Arch. Examinations 2011-2012

Sub: ARCH 253 (Design Theory-II)

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. 4 (**FOUR**) and any 2 (**TWO**) from the rest.

1. Describe Point and Line as primary elements in architecture. (20)
2. Explain with sketches the reasons for formal collision of geometry. (20)
3. Describe how Elevated base plane acts as horizontal space defining element and what are the character of these spaces? (20)
4. Write short notes on any 2 (**TWO**): (15×2=30)
 - (a) Visual Properties of Form
 - (b) Dimensional transformation
 - (c) Different processes of additive transformation.

SECTION – B

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

Answer Q. No. 8 (**EIGHT**) and any 2 (**TWO**) from the rest.

5. What are the types of relationships that exist between spaces? Discuss them with sketches. (20)
6. Describe the following spatial organizations briefly: (20)
 - (a) Radial
 - (b) Grid
7. (a) Discuss briefly the different types of building approaches. (10)
(b) What are the forms of circulation space? Describe them with sketches. (10)
8. Write short notes on any 2 (**TWO**): (15×2=30)
 - (a) Renaissance theories
 - (b) The Modular
 - (c) The Ken