BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1   B. Arch. Examinations 2012-2013

Sub : CE 265 (Structure I: Mechanics)

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 any FOUR.

1. (a) Define Centroid of Gravity. How you can determine Centroid of a non uniform structural member section?   (3)

(b) In Figure 1, A section "P" is shown. There is an L shaped hollow portion with 1 inch thickness inside this section P. Determine Centroid of Gravity of section "P".   (14½)
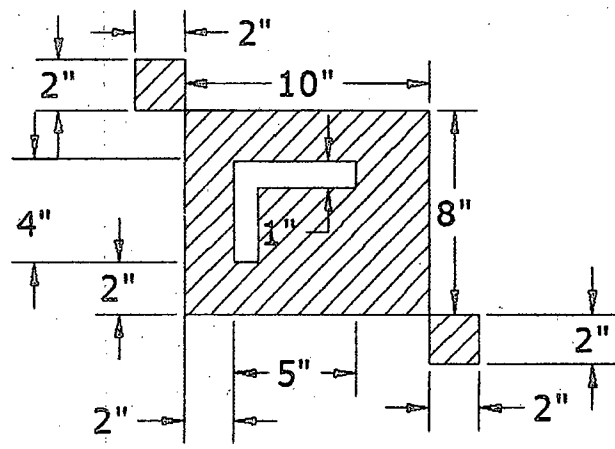
Section "P"

Figure 1

2. (a) What is the difference between non-coplanar concurrent force and coplanar non-concurrent force system? Explain with figures.   (2½)

(b) Derive General Cable Theorem.   (5)

(c) A rectangular body P is in AB plane as shown in "Figure 2". Weight of body P is 50 Kip. The forces acting on this body are shown in the figure. Determine the surface reaction of AB plane and value of friction force. Given, friction factor of AB surface is 0.25.   (10)
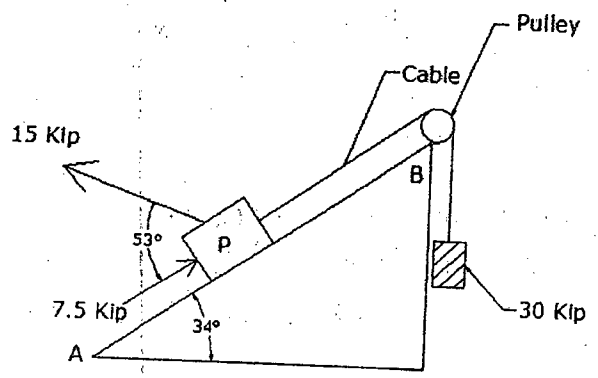

Figure 2

CE 265/ARCH

3. (a) What are the assumptions of a roof truss. (1½)

(b) There are four spheres A, B, C & D shown in "Figure 3". Weight of sphere A is 10 kip, sphere B is 12 kip, C is 5 kip and D is 5 kip. Diameter of sphere A is 3 feet, B is 3 feet and 3 inch, C is 2 feet and D is 2 feet. Determine the surface reactions on sphere D from both vertical and horizontal surfaces. (16)
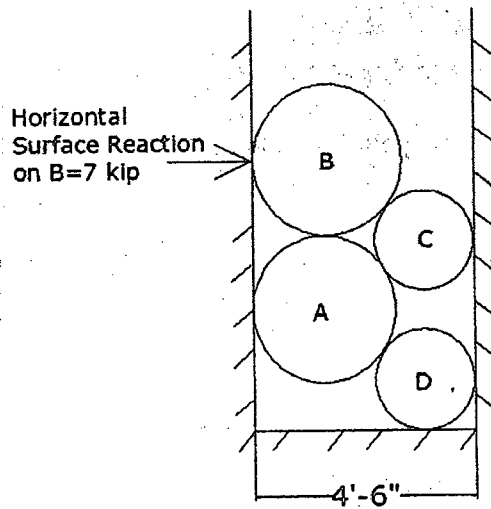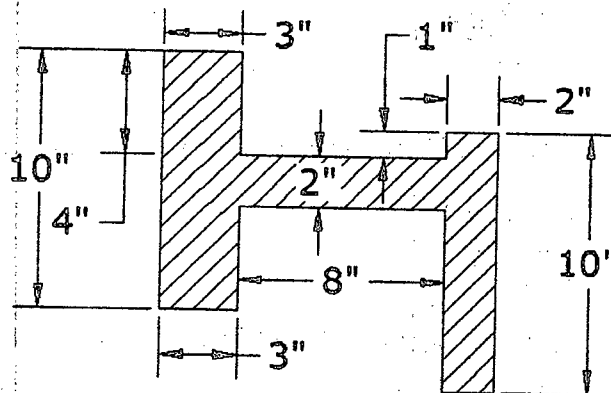
Figure 3

4. (a) What do you mean by Moment of Inertia of Area of any section? (2)

(b) Thee is a section "Q" in Figure 4. Determine Moment of Inertia of Area of this section Q. (15½)

Section "Q"

Figure: 4

5. (a) Develop an equation showing "Shape of Uniformly Loaded Cable". (6)

(b) From the coplanar concurrent force system shown in "Figure 5" acting on the irregular body through point A, determine the resultant force and its direction. Given weight of the A body is 12 lb acting through Point A. (11½)
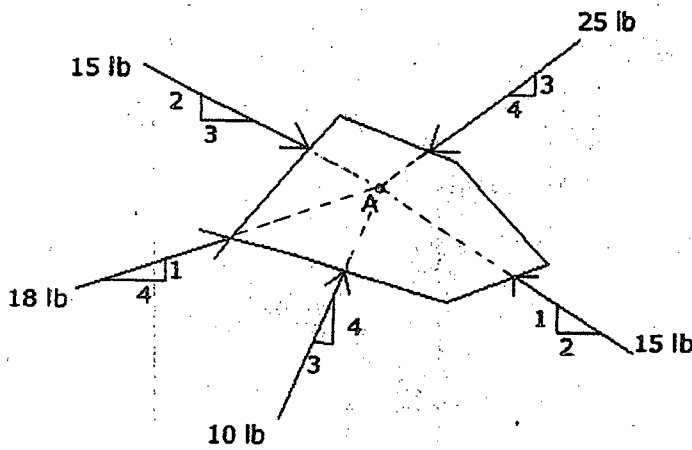
CE 265/ARCH

Contd... Q. No. 5(b)

Figure: 5

SECTION – B

There are FIVE questions in this section. Answer any FOUR.

6. (a) A 500 lb. cylinder A rests on a smooth plane as in figure 6. For a tension in the rope of 250 lb., find the inclination of the plane and the plane reaction. **(11)**

   (b) What are the forces on the members AB and BC in figure 7 if $\theta = 30°$? **(6½)**

7. The arrangement in figure 8 may be balanced on roller A. Let F = 200 lb., let the 18 ft uniform beam weight 10 lb/ft, and neglect the weights of the pulleys and rope. Calculate the distance x for this balance. **(17½)**

8. (a) What does "determinate structure" mean? Is the beam in Figure 9 a determinate structure? Explain. **(5)**

   (b) Determine support reactions of the beam shown in Figure 9. **(12½)**

9. (a) Write down the assumptions of an ideal truss. **(4)**

   (b) Find bar forces of ke, jd, kf and ef in the truss shown in figure 10. **(13½)**

10. If A, B and C, in figure 11, each weighs 500 lb., and $f_s = \frac{1}{4}$ for all surfaces, find the force Q that is needed if counterclockwise rotation of the lever is impending. **(17½)**
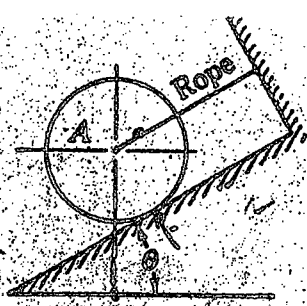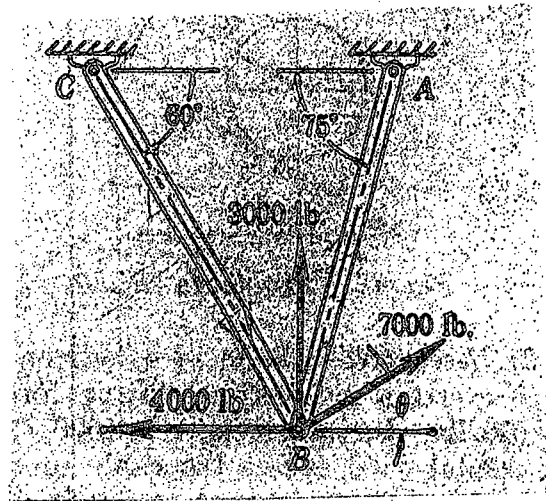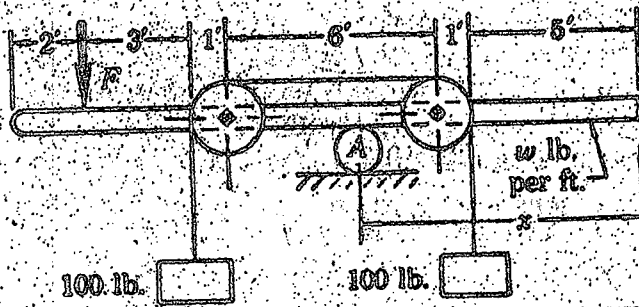

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Figure - 6

Figure - 7

Figure - 8

Figure - 9

Figure - 10

Figure - 11

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1   B. Arch. Examinations 2012-2013

Sub : **ARCH 265** (Building Technology)

Full Marks: 140   Time : 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.
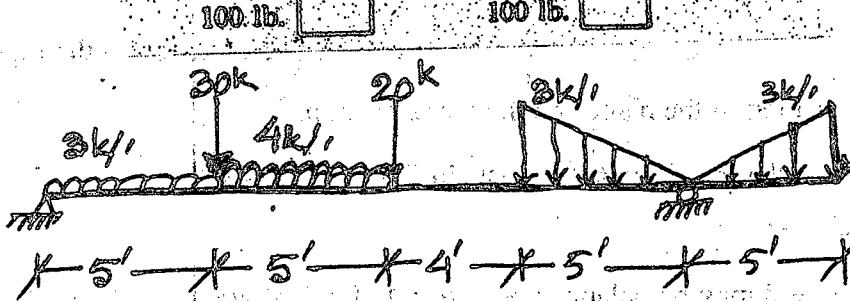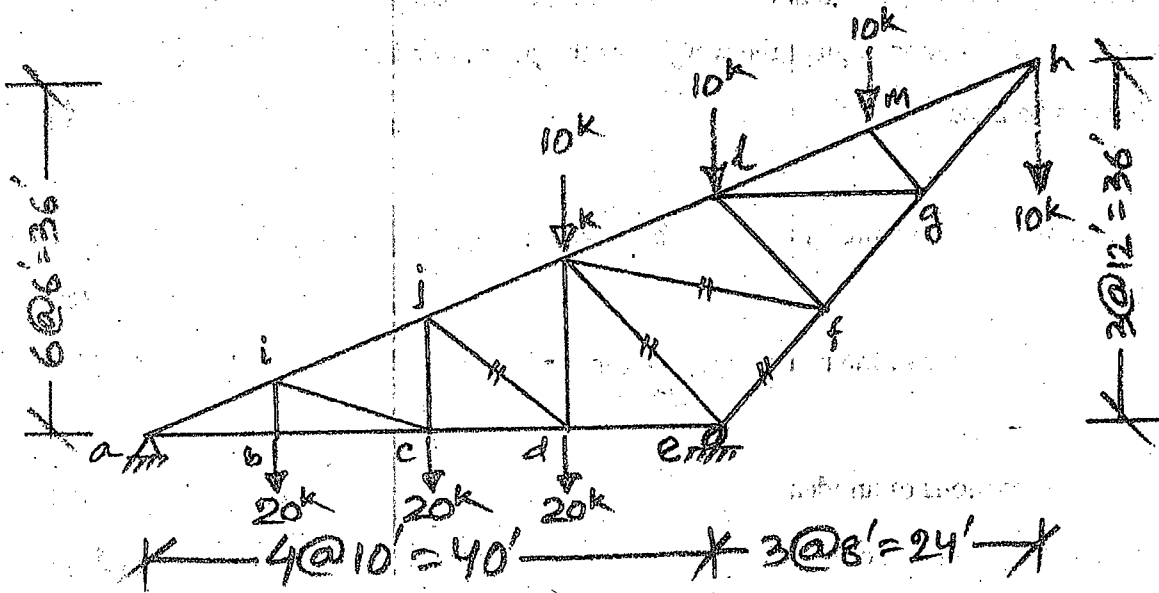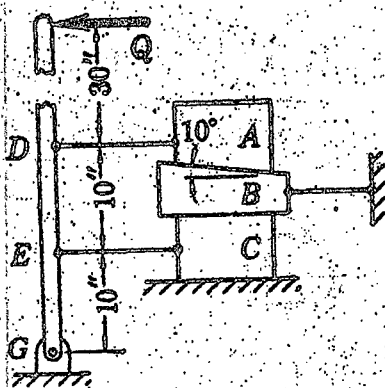

SECTION – A

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

1. (a) Explain the following folded plates with explanatory sketches.   **(15)**

     (i)   Rigid frame folded plates

     (ii)   Folded plate with and without stiffness

     (iii) Parallel folds and fan shaped folds.

   (b) Discuss with neat sketches the structural principles of folded plate and elaborate how

   a folded plate works.   **(8⅓)**

2. (a) Explain the structural principles of space frame.   **(8⅓)**

   (b) Discuss elaborately the structural system of the following space frames   **(15)**

     (i)   Plane system trusses.

     (ii)   Mannesmann system.

     (iii) Mero system.

     (iv) Unistrut system

     (v)   Tubular system.

3. (a) Discuss the Types of Stone. What is stonemasonry?   **(8⅓)**

   (b) Explain with sketches (any three)   **(15)**

     (i)   Rubble Masonry.

     (ii)   Ashlar Masonry.

     (iii) Stone Veneer.

     (iv) Slipform Stonemasonry.

4. (a) What is a Geodesic dome?   **(5)**

   (b) What is the difference between Prof. Bavess feld's dome and Buck minister Fuller's

   Geodesic dome?   **(8⅓)**

   (c) How can you design a sustainable structure following the Fuller's principle?   **(10)**

ARCH 265

SECTION – B

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

5. (a) What are the fundamental benefits of plastics in construction? **(13⅓)**

   (b) Specify the scope of using plastics in construction industry. **(10)**

6. (a) What are the objective of Modular co-ordination? **(8⅓)**

   (b) Write short notes (any five) **(15)**

   (i) Basic Module

   (ii) Controlling Dimension

   (iii) Controlling Zone

   (iv) Co-ordination Plane

   (v) Element

   (vii) Modular Co-ordination

7. (a) Overview the main causes for waste in conventional construction. **(10)**

   (b) What are the advantages of Pre-fabrication? **(13⅓)**

8. Describe with neat sketches two building techniques with indigenous materials in Bangladesh. **(23⅓)**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1   B. Arch. Examinations 2012-2013

Sub : **HUM 111** (English)

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. 1 and any other **TWO** from the rest.

1. Read the following passage carefully and answer the questions that follow: **(30)**

"Failure is the pillar of success" goes the adage. It is personal, humiliating, image-wrecking but it is not as bad as you think.

If ever there was a failure designed to kill a career, Sergio Zyman's was it. In 1984 Coca-Cola gave him responsibility for reversing Coke's decline versus Pepsi. Zyman's strategy was to replace Coke's formula, label it "New Coke" and blare the news. His error, which some attribute to ego, was failing to keep old Coke on the market. New Coke was the most disastrous new product launched since American's famous flop, the Edsel car. Within 79 days, old formula Coke was back on the supermarket shelves, as Classic Coke. A year later, wounded Zyman left Coca-Cola.

Just seven years later, Zyman bounced back to Coca-Cola, his ego intact and his job expanded.

When Sergio Zyman left Coke, he didn't take to anyone from the company for 14 months. "It was lonely," he remembers. But he didn't close any doors. With a partner he started a consulting company. Operating out of his Atlanta basement ("One Zyman Plaza," he jokes) with a computer, a phone and a fax machine, he built a business advising clients such as Microsoft and Miller Brewing. His mantra: think unconventially, take risks.

Eventually, even Coca-Cola sought his advice. But says Zyman, "In my wildest dreams, I never thought the company would ask me back". Then management told him they needed help shaking things up. "We became uncompetitive by not being tolerant of mistakes," admits Coca-Cola CEO Robert Goizueta. "You can stumble only if your're moving."

Zyman is just one person who has screwed up, been fired or demoted or somehow failed — and bounced back. Walt Disney was fired from one of his jobs and both Disney and Henry Ford saw ventures end up in bankruptcy before they made it big time.

Bill Gates likes to hire people who have made mistakes. "It shows that they take risks," he says. "The way people deal with things that go wrong is an indicator of how they deal with change."

HUM 111/ARCH

Sweet are the uses of adversity as Shakespeare said. Failure made Sergio Zyman a strange - but true model for the new world. If you haven't failed yet, for the benefit of your career you probably should.

Questions:

    (i)   What do we think normally about failure?

    (ii)   What is the belief of Zyman about success?

    (iii)   What does Bill Gates learn from the people who have made mistakes?

    (iv)   How did Sergio Zyman prove to be a model for the new world?

    (v)   What message does this passage convey to you?

    (vi)   Give the meanings of the following words as used in the passage:

        Adage, image-wrecking, blare, ego, ventures.

2.   (a) Suppose you are the chief engineer of a construction firm. Draft a suitable complaint letter about having received sub-standard construction materials from your suppliers. (Provide other details from your own.) **(10)**

    (b) Give phonetic transcription of the following words: (Any five) **(10)**

        Angel, near, basic, cottage, frank, doubt.

3.   (a) Write a dialogue between two architects about bringing innovations in architectural design in Bangladesh. **(10)**

    (b) Write a short essay on any one of the following topics: **(10)**

        (i)   Depression: A Global Crisis

        (ii)   Our Architectural Heritage

        (iii)   Environmental Disaster.

4.   (a) Transform the following sentences as directed: (Any five) **(10)**

        (i)   We are all born with a divine fire in us. (Complex)

        (ii)   The news is too good to be true. (Complex)

        (iii)   I called her, but she did not answer. (Simple)

        (iv)   Sujana kept her promises. (Compound)

        (v)   The war is over and silence prevails. (Simple)

        (vi)   He must find husbands for his three daughters. (Compound)

    (b) Write short notes on any <u>two</u> of the following: **(10)**

        (i)   Process of communication

        (ii)   Components of a formal report

        (iii)   Diphthongs.

HUM 111/ARCH

SECTION – B

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

Symbols indicate their usual meaning.

5.   (a) Explain with reference to the context any one of the following.   **(8)**

     (i)   "I am amazed to see you take my poison and suffer no magic change. I am sure you are Odysseus whom nothing defeats."

     (ii) "You have lost reason and taken the wrong path. You have taken lies for truth, and hideousness for beauty."

  (b) Answer any one of the following.   **(10)**

     (i)   Make an evaluation of the changes that came over the life of the lawyer.

     (ii) Mrs. Matilda Loisel suffered more than she deserved. — Discuss according to the story of 'The Diamond Necklace'.

  (c) Answer any three of the following.   **(12)**

     (i)   Briefly discuss the terms and conditions of the bet taken by the banker and the lawyer.

     (ii) What was the topic of discussion in the party hosted by the banker?

     (iii) What impression do you get about Mr. Loisel as a husband?

     (iv) Why did Mrs. Forestier fail to recognize her friend?

     (v) What do you know about Circe?

6.   Recast and correct any ten of the following sentences.   **(20)**

     (i)   We heard a sound somewheres in the distant woods.

     (ii)   Walt Whitman occupies a most unique place in literature.

     (iii)   The militia is discussing the battle among itself.

     (iv)   It is I who is to make the call.

     (v)   If I were him, I should not accept the post.

     (vi)   I wish I was as tall as my brother.

     (vii)   He played good in every game.

     (viii) We were late due to the blowout.

     (ix)   They can't hardly speak English.

     (x)   He had a need and interest in athletics.

     (xi)   We shall combine the three departments into one.

HUM 111/ARCH

7. (a) Give the meaning of any ten of the following words. **(10)**

accost, blithe, chasm, coerce, deprecate, eloquence, forbearance, holocaust, indictment, lullaby, moron, sleazy.

(b) Make sentences with any ten of the following words. **(10)**

Assuage, boulder, confiscate, enervate, flounder, homage, meddle, oblivion, recluse, surfeit, wither, zealot.

8. Write a précis of the following passage with a suitable title. **(20)**

The liberty of the individual is no gift of civilization. It was unlimited before there was any civilization, though then, it is true, it had for the most part no value, since the individual was scarcely in a position to defend it. The development of civilization imposes restriction on it, and justice demands that no one shall escape those restrictions. What makes itself felt in a human community as a desire for freedom may be their revolt against some existing injustice, and so may prove favourable to a further development of civilization; it may remain compatible with civilization. But it may also spring from the remains of the original personality, which is still untamed by civilization. The urge for freedom, therefore is directed against particular forms and demands of civilization or against civilization altogether. It does not seem as though any influence could induce a man to change his nature into termite's. No doubt he will always defend his claim to individual liberty against the will of the group. A good part of the struggles of mankind centres round the single task of finding an expedient accommodation – one, that is, that will bring happiness – between this claim of the individual and the cultural claim of the group; and one of the problems that touches the fate of humanity is whether such an accommodation can be reached by means of some particular form of civilization or whether this conflict is irreconcilable.

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1   B. Arch. Examinations 2012-2013

Sub : **ARCH 261** (Construction Methods and Details)

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. 1** and any **TWO** from the rest.

1. Write short notes on the following: **(20)**

   (a) Sequence of construction for a RCC building

   (b) Components of floors.

2. (a) What are the different functions and essential requirements of foundation for a

   building?   **(15)**

   (b) Describe different points to be considered in selection of a floor finish.   **(10)**

3. Describe with sketches at least five types of foundation. Discuss the advantages and

   disadvantages of deep foundation.   **(25)**

4. Draw sketches of the followings (Any Two)   **(12½×2=25)**

   (a) Damp proof course at ground level.

   (b) Detail section of a tile floor at upper floor.

   (c) Section of a Cast in situ pile foundation.

SECTION – B

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

Answer **Q. No. 5** and any **TWO** from the rest.

5. What is brick masonry? Describe 15 important rules for bonding.   **(20)**

6. (a) Draw the following brick bonds: **(5)**

   Strecher bond, Header bond, Diagonal bond, Zig-zag bond, Garden wall bond.

   (b) Differentiate between English bond and Flemish bond.   **(5)**

   (c) Discuss the major planning considerations in designing kitchens and toilets.   **(15)**

ARCH 261

7. (a) What are the requirements for a good stair? **(10)**

   (b) Describe various types of stairs used in buildings. Illustrate answer with sketches. **(15)**

8. (a) Draw the detail section of cavity wall at the following levels, **(15)**

   (i) the plinth and sill level

   (ii) lintel and parapet level

   (b) What are the points to be kept in view while locating doors and windows in a building? **(10)**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1   B. Arch. Examinations 2012-2013

Sub : **PLAN 219** (Basic Planning)

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.   (a) Discuss about the criteria that are required for a plan to be successful.   **(12)**

    (b) Why is stakeholder analysis important in the planning process? Give examples of some major stakeholders in the land use planning procedure.   **(8+3⅓=11⅓)**

2.   (a) Describe the approaches or techniques available to a planner in the decision making stage of a planning process.   **(8)**

    (b) Explain briefly the features which differentiate innovative planning from allocative planning.   **(10)**

    (c) Which ecological model of the city represents the spatial structure of Dhaka City? Give reasons behind you answer.   **(5⅓)**

3.   (a) Describe with examples the characteristics of a planning objective.   **(7)**

    (b) Describe the importance of spatial planning with appropriate examples.   **(12)**

    (c) Why is it important to analyze environment during preparation of a plan?   **(4⅓)**

4.   (a) There are different types of constraints when a plan is formulated and implemented. Discuss about the constraints a planning agency would face for the development of a new road which will pass through both rural and urban areas.   **(9⅓)**

    (b) The ecological models of the city were developed based on some assumptions. What are these assumptions? Explain briefly how the violation of these assumptions would affect the validity of the models.   **(7+7=14)**

PLAN 219/ARCH

SECTION – B

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

5. (a) What do you mean by human settlements? Write down the major differences between rural and urban settlements. **(12)**

    (b) Describe the origin and evolution of settlements from cave life to city life. **(11⅓)**

6. (a) State some important facts about ancient civilization. Name the major ancient cities and their locations. **(8⅓)**

    (b) Describe the main features of the Egyptian civilizations. Give a brief description of two cities of this period. **(8)**

    (c) What are the characteristics of the Sumerian cities of Ur and Temends? **(7)**

7. (a) What do you know about the classical period? Describe briefly who was Hippodomus? What are his contributions to City Planning? **(9⅓)**

    (b) Describe the city planning of the Medieval period. **(7)**

    (c) What is the impact of gun power on cities of the Renaissance period? **(7)**

8. Write short notes (any four): **(23⅓)**

    (a) The BaroQue City

    (b) Town planning after industrial revolution

    (c) MohenjoDaro and Harappa

    (d) Wari Bateshwar

    (e) Classification of cities.

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BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1   B. Arch. Examinations 2012-2013

Sub : **ARCH 231** (Environment and Design II: Visual and Sonic Environment)

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. Explain the four photometric terms: flux, intensity, illumination and luminance along with their conceptual relationship. (23⅓)

2. Elaborate the unique qualities of daylight. (23⅓)

3. Discuss the differences in daylight design strategies of buildings in hot-dry climate and those in warm-humid climate. (23⅓)

4. Elaborate with annotated sketches the daylighting features of an internationally renowned architectural project. (23⅓)

SECTION – B

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

5. (a) Write short notes on the following (any THREE): (4×3=12)

   (i)   Acoustics   (ii)   Sound Pressure Level

   (iii) Octave bond   (iv)   Loudness Level

   (b) Calculate the Reverberation Time (RT) at 1 kHz for the room shown in Fig. 1. From the result, make comments if the room is suitable for speech in Bangla. (8+2=10)

6. (a) How does sound behave in an enclosed space for reflection, diffraction and refraction? (4×3=12)

   (b) Explain the statement: "Acoustical performance of a space should not be assumed as a post-construction assignment, rather it should be ensured during design phase". (4)

ARCH 231

7. (a) Explain with schematic drawings the effects of absorption, transmission and diffusion of sound in a space. **(4×3=12)**

(b) What is Reverberation Time? Give examples of recommended Reverberation Time for two different acoustical functions. **(2+2=4)**

8. (a) Explain the following singular phenomena: **(4×3=12)**

(i) Flutter echo (ii) Sound focus and dead spot (iii) Whispering Gallery

(b) Describe how an echo can be avoided in a space. **(4)**

9. (a) What are the adverse effects of noise on human being? Give examples of typical average ambient noise levels of four different types of spaces. **(4+2=6)**

(b) What are the major streams of building acoustics? Briefly mention the general requirements for acoustic design of a room. **(2+4=6)**

(c) In schematic sections, show examples of 'poor' and 'good' acoustical options for ceiling and balcony design of an auditorium. **(4)**

Fig. 1

Materials	Absorption Coefficient		
	250 Hz	500 Hz	1 kHz
1 Concrete	0.01	0.02	0.02
2 Carpet on concrete	0.06	0.14	0.37
3 Glass	0.25	0.18	0.12
4 Wood panel on wall	0.25	0.20	0.17
5 Brick wall, plastered	0.02	0.02	0.03

Note: Ignore absorption by the volume of air in the room
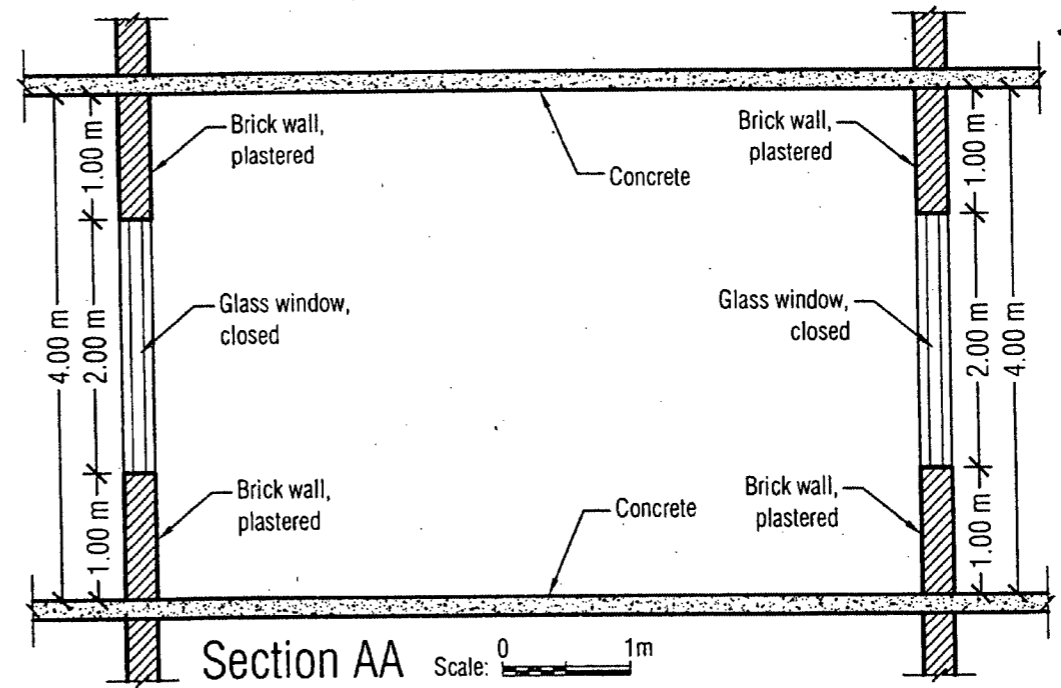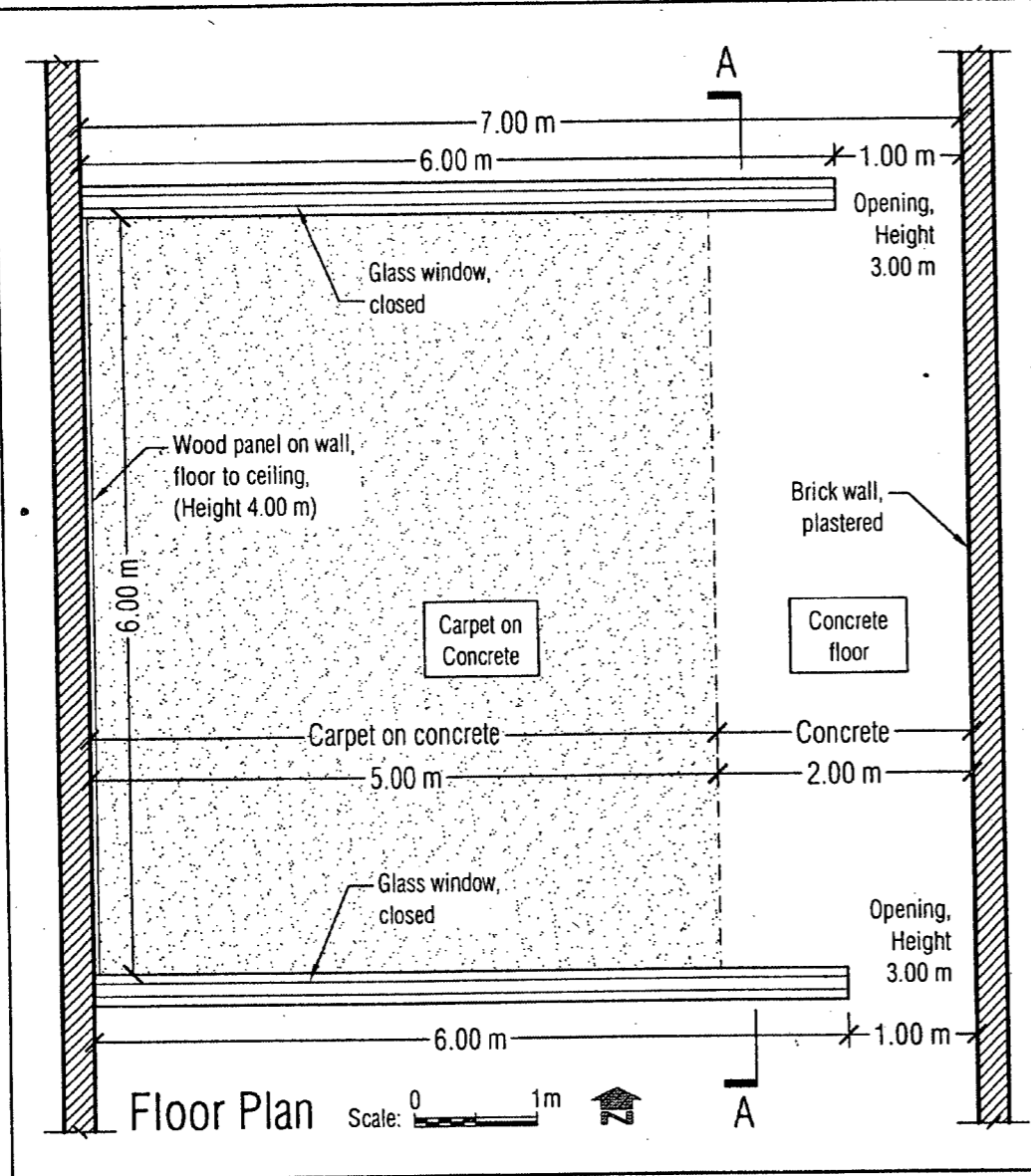
BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1   B. Arch. Examinations 2012-2013

Sub : **HUM 113** (Economics)

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. (a) Why does demand curve slope downward? Explain the factors that affect the changes in demand.   **(10⅓)**

   (b) Explain price elasticity of demand, cross elasticity of demand and income elasticity of demand.   **(6)**

   (c) Two equations are given: **(7)**

   $$100Q + 200P = 2000 \text{ and}$$
   $$100Q = 1000 + 200P$$

   Find the equilibrium price and quantity and show graphically.

2. (a) "The more inelastic the demand curve, the more tax burden on the consumer, if the per unit tax is imposed on a producer" — Justify the statement.   **(13⅓)**

   (b) From the data find the price elasticity of demand and make comment on it.   **(10)**

   $$P_1 = 270, Q_1 = 720, P_2 = 330, Q_2 = 480$$

3. (a) Define 'total utility' and 'marginal utility'. Graphically show the relationship between 'total utility' and 'marginal utility'.   **(11⅓)**

   (b) Applying the knowledge of demand and supply show the following changes in equilibrium graphically: **(4×3=12)**

        (i)   During the winter season the price of umbrella falls.

        (ii)   Price of boat increases during flood.

        (iii)   Wages of Architect increase when urbanization increases.

        (iv)   Price of coffee falls, price of tea also falls.

4. (a) What do you mean by Production Possibility Frontier (PPF)? What will be the impact of the changes in technology and resources on the PPF? Compare the PPF of a rich nation and that of a poor nation.   **(10⅓)**

   (b) The utility function of Mr. Faruk is given by $U = f(n,m) = n^{1/4}m^{3/4}$. Find out the optimal quantities of good 'n' and good 'm'. The prices of 'n' and 'm' are Tk. 6 per unit and Tk. 3 per unit respectively. The income of Mr. Faruk is Tk. 120.   **(7)**

   (c) Explain the "law of equi-marginal utility".   **(6)**

HUM 113/ ARCH

SECTION – B

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

5. (a) Define production function. Discuss the factors of production with reference to the context of Bangladesh. **(8⅓)**

   (b) Mathematically deduce the rational region of production of a firm. **(10)**

   (c) What are the conditions of profit maximization? **(5)**

6. (a) Discuss the various external economies and diseconomies of scale of production. **(5)**

   (b) Distinguish between the concepts of fixed cost and variable cost. **(3⅓)**

   (c) Explain short run total cost curves and short run per unit cost curves. Present hypothetical average and marginal cost schedules, plot these schedules on graph and show that short run cost curves are u-shaped. **(8)**

   (d) Calculate the profit maximizing level of output and maximum profit from the following total revenue (TR) and total cost (TC) functions **(7)**

$$TR = 4350Q - 13Q^2$$
$$TC = Q^3 - 5.5Q^2 + 150Q + 675$$

7. (a) What are the assumptions of perfect competition? Explain them. **(5)**

   (b) What is meant by equilibrium of a firm? Explain the short run equilibrium of a firm under perfect competition. **(8⅓)**

   (c) Graphically explain the shut-down point of production of a firm under perfect competition. **(5)**

   (d) Briefly discuss the equality between savings and investment. **(5)**

8. (a) Narrate the difficulties in the measurement of national income. **(7)**

   (b) Illustrate the concept of inflation. **(3⅓)**

   (c) Explain the following policies for controlling inflation with reference to the context of Bangladesh **(8)**
      (i) Monetary policy
      (ii) Fiscal policy
      (iii) Trade policy.

   (d) Given that **(5)**
      GNP = Tk. 1,07,000 crore
      Depreciation = Tk. 9,000 crore
      Indirect tax = Tk. 12,500 crore
      Subsidy is 20% of indirect tax.
   Calculate national income.