L-2/T-2/ARCH **Date : 01/07/2015**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-2 B. Arch. Examinations 2013-2014

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

Full Marks : 140 Time : 3 Hours

The figures in the margin indicate full marks.

Assume any reasonable value of missing data.

USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – A

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

1. (a) Write down the different failure types of bolted or riveted joint. **(5)**

   (b) Determine the number of bolts required, and an appropriate layout, to transmit a dead-load force of 80 kips and a live-load force of 240 kips through two C 10×30 to a 1-in gusset plate (Fig. 1). All material is A36. Bolts are ¾ in A325 (standard holes) in a bearing-type connection with threads excluded from the shear planes. Use three lines of bolts across the web of the channel. Use **AISC/ASD** method. Given: thickness of the channel web = 0.673 in., allowable shear strength = 30 ksi. Assume other values if require. **(18⅓)**

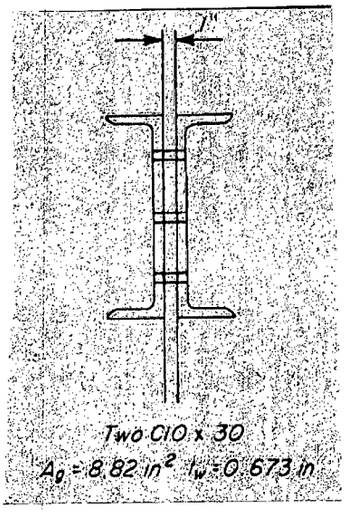

Fig. 1 (For Q. no. 1(b) & 2(a))

2. (a) What do you mean by electrode identification code number EXXXXX? **(5)**

   (b) Design and draw the welded end connection required to transmit a dead-load force of 50 kips and live load force of 100 kips through two C10 × 30 to a 1-in gusset plate shown in Fig. 1. All materials is A 36. Welds are to be deposited manually using E50XX electrodes. Use AISC/ASD method. Given that, $Fv = 0.3F_{EXXXX}$. Assume other values if require. **(18⅓)**

Contd P/2

CE 267(ARCH)

3. (a) Define 'Ultimate Stress', 'Allowable Stress' and 'Factor of Safety'. **(6)**

   (b) Members *AB* and *AC* of the structure shown in Fig. 2, consist of bars of square cross section made of same alloy. It is known that a 20 mm square bar of the same alloy was tested to failure and that an ultimate load of 120 kN was recorded. If bar *AB* has a 15 mm square cross section, determine the factor of safety for bar *AB*. **(17⅓)**

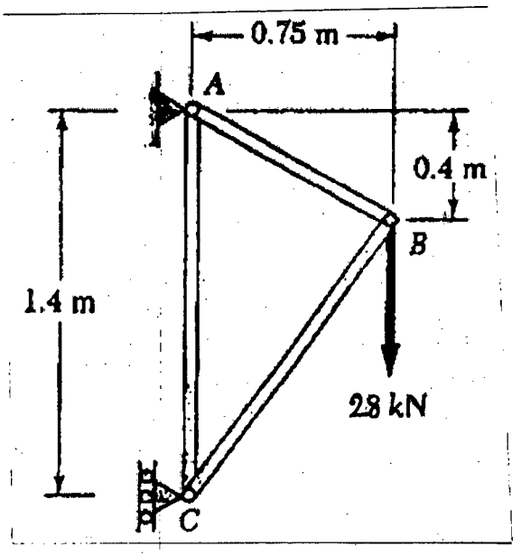

Fig. 2
for Q. no. 3(b).

4. (a) Differentiate between Allowable Stress Design (ASD) method and Load Resistance Factor Design (LRFD) method. **(5)**

   (b) A rod consisting of two cylindrical portions *AB* and *BC* is restrained at both ends as shown in Fig. 3. Portion *AB* is made of steel ($E_s = 29 \times 10^6$ psi, $\alpha_s = 6.5 \times 10^{-6}$/°F) and portion *BC* is made of brass ($E_b = 15 \times 10^6$ psi, $\alpha_b = 10.4 \times 10^{-6}$/°F). Knowing that the rod is initially unstressed, determine the normal stresses induced in portions *AB* and *BC* by a temperature rise of 65°F. **(18⅓)**

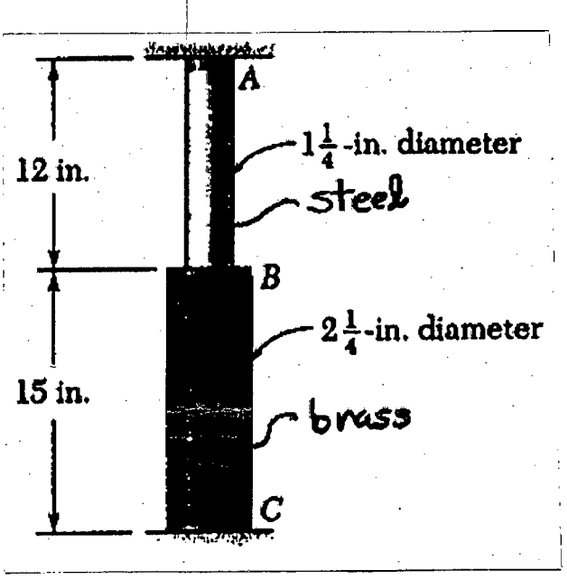

Fig. 3
for Q. no. 4(b).

CE 267(ARCH)

SECTION – B

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

5. (a) Draw a qualitative stress strain diagram of an elastic material showing upper yield stress, lower yield stress, ultimate stress and breaking stress. **(8⅓)**

(b) Draw shear force diagram and bending moment diagram for the beam shown in Fig. 4. **(15)**

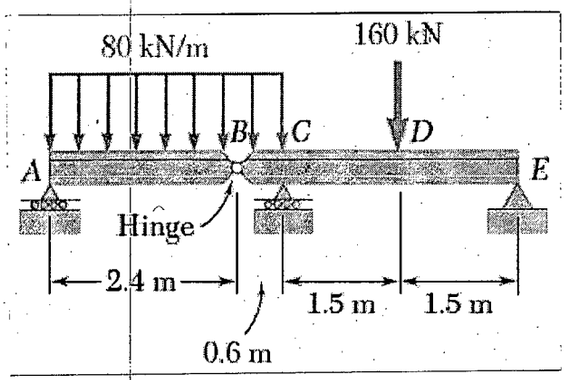

Fig. 4 (for Q. no. 5(b))

6. (a) Explain following terms with figures. **(8)**

(i) Strain Hardening

(ii) Necking

(iii) Toughness

(iv) Modulus of resilience

(b) Draw shear force diagram and bending moment diagram for the frame shown in Fig. 5. The 20 Kip force is acting at the midpoint of AB. **(15⅓)**

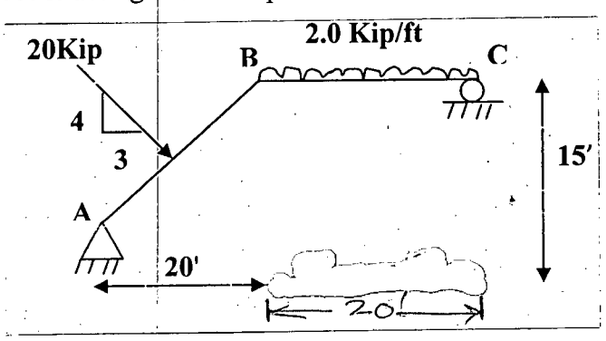

Fig. 5 (for Q. no. 6(b))

7. (a) What is the difference between ductile and brittle material? Give examples of these materials. **(8⅓)**

(b) A bar made of A-36 steel having dimensions shown in Fig. 6. If an axial force of P = 80 kN is applied to the bar, determine change in its longitudinal and lateral dimensions after applying the load. The material behaves elastically. Given, modulus of elasticity of the material is 200 GPa and poison's ratio is 0.32. **(15)**

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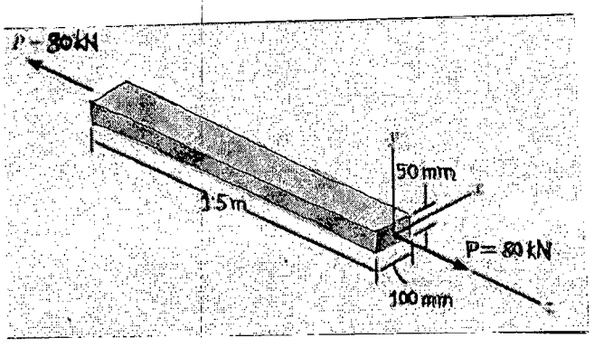


Fig. 6. for Q. no. 7(b)

8. (a) Define shear stress. What is the difference between single shear and double shear? **(5)**

   (b) Determine the deformation of the steel rod shown in Fig. 7 under the given loads. Given modulus of elasticity of steel = 32×10^6 psi. **(18 ⅓)**

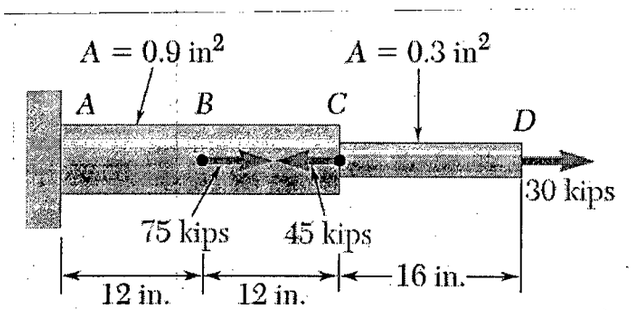


Fig. 7 for Q. no. 8(b)

L-2/T-2/ARCH **Date : 08/07/2015**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-2 B. ARCH Examinations 2013-2014

Sub : **CE 271(231)** (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) What are the main requirements of supplying water to a building? With a neat sketch, describe the various components of a House Water Connection. **(10)**

   (b) A two storied residential building has the following sanitary fixtures. **(13 ⅓)**

Type of Fixture	No. of Fixture
Tap	2
Shower	2
Wash Basin	2
Water Closet	2
Ablution Tap	2
Kitchen Sink	1
Kitchen Tap	1

   The main pressure is 30 psi. Water is supplied from the service pipe by upfeed system and the minimum faucet pressure is 5 psi

   (i) Determine the maximum probable water demand.

   (ii) Determine the required size of the supply pipe (Necessary Table, Graph and Nomographs are attached for solving the problem)

2. (a) With neat sketches, state the available water supply systems in a building. What are the applicability of these systems? Describe. **(13 ⅓)**

   (b) Write down the principles governing the design of water distribution system in a building. **(10)**

3. (a) How can you supply water to a tall building? Describe. **(7)**

   (b) You need to design the water distribution system of a 4-storied Apartment building by downfeed system. The main pressure is 40 psi and the minimum fixture pressure is 5 psi. Each storey has the following fixtures: **(16 ⅓)**

Type of Fixture	No. of Fixture
Bath Tub	1
Water Closet	3
Shower	2
Tap	3
Kitchen Sink	1
Kitchen Tap	1

Contd P/2

CE 271(ARCH)
Contd ... Q. No. 3(b)

(i) Determine the minimum height of the Roof Tank of the building.

(ii) Determine the water distribution pipe sizes of the building.

(Table, Graph, Nomographs are attached).

4. (a) What is the purpose of using Traps in Building Drainage System? Describe different types of Traps according to their use. **(11 ⅓)**

   (b) Write short notes on (i) Plumbing (ii) Fixture Unit valve (iii) Sullage (iv) Vent system **(12)**

SECTION – B

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

5. (a) What factors should be considered in designing the building drainage system? Describe the advantages and disadvantages of Two Pipe system over One Pipe system. **(15)**

   (b) What are the purposes and proper locations of Manholes? **(8 ⅓)**

6. (a) With a neat sketch describe the processes that take place in a Septic Tank. **(13)**

   (b) Determine the number of Rainwater Downpipe for a roof area of 4320 sft for draining the rainwater as quickly as possible. The intensity of local rainfall is 3.5 inch/hour. **(10 ⅓)**

7. (a) What are the objectives of Sanitation? Name low-cost sanitation technologies available in rural Bangladesh. State the advantages and disadvantages of Pour Flush Latrine. **(13)**

   (b) A family of 6 members has decided to construct a Pit Latrine for a design life of 3 years in the village home. Local Village Center sells precast concrete rings of 1.0 m diameter and 0.3 m depth. The soil is unconsolidated, loose and the groundwater table is 4.8 meter below the ground surface. Determine the volume and total depth of the pit. **(10 ⅓)**

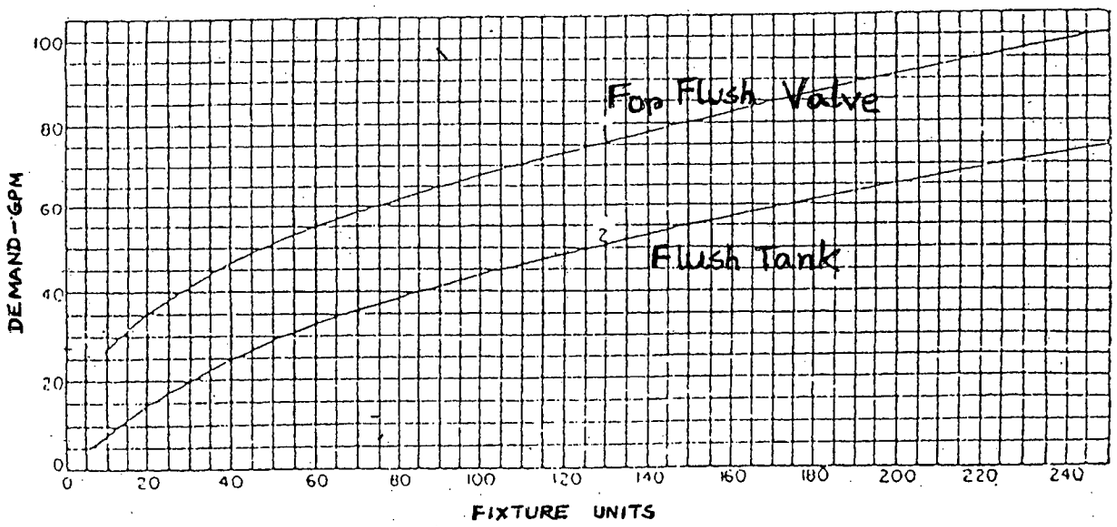
8. (a) Why is SBS system is preferred over Onsite Septic Tank System or Conventional Sewerage System? Explain.

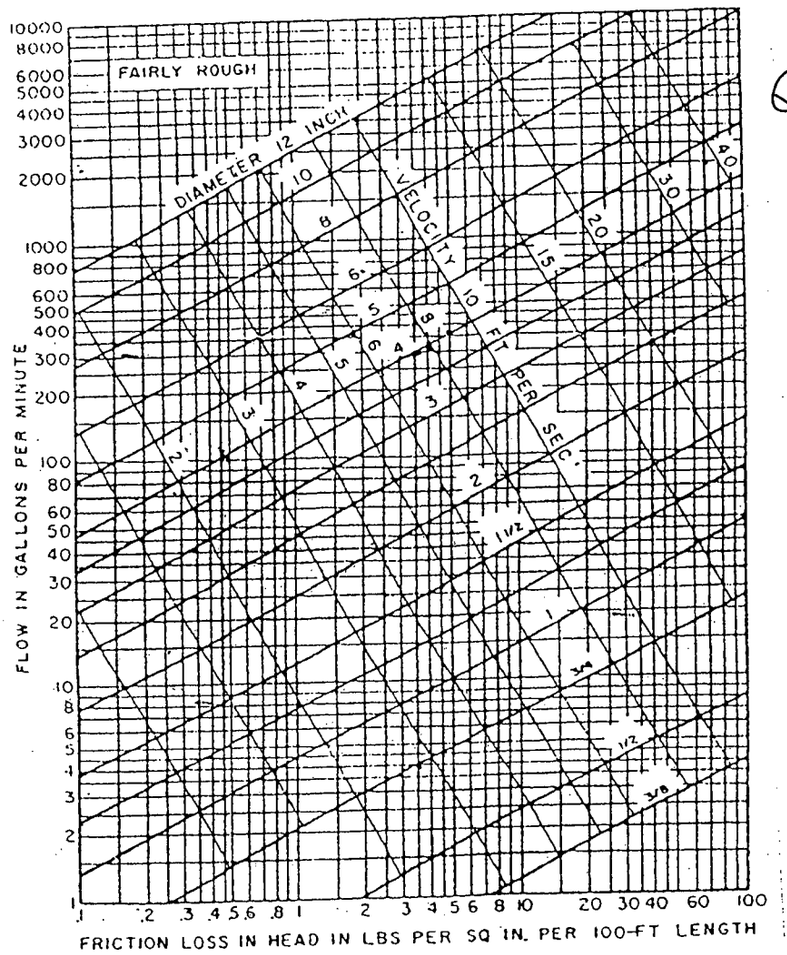
   Name the elements of SBS system. What is the recommended safe distance between latrine and groundwater table to prevent contamination of groundwater? **(16 ⅓)**

   (b) What are the difficulties in laying pipes in sunken slab? How can you overcome it? **(7)**

Table: Fixture Unit values

Type of Fixture	Fixture Unit Value	
	Private	Public
Lavatory	1	2
Bath tub	2	4
Water Closet (Flush tank)	3	5
Water Closet (Flush valve)	6	10
Urinal	----	5
Shower	2	4
Kitchen Sink	2	4
Hand wash basin	2	4
Ablution Tap	1	1





Questions 1(b) & 3(b)

L-2/T-2/ARCH **Date : 02/08/2015**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-2 B.Arch. Examinations 2013-2014

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 notes on the following. **(2×15=30)**
   (a) Visual properties of form
   (b) U-shaped vertical plane as space defusing element.

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

3. How Elevated bas plane and Depressed base plane define spaces. Explain them with sketches. **(20)**

4. Describe line as primary element in architecture. **(20)**

SECTION – B

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

5. Discuss 'Path-Space relationship' and 'Entrance' as elements of circulation. **(20)**

6. Describe the following spatial organization **(20)**
   (a) Centralized Organization
   (b) Linear Organization

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

8. Write notes on the following **(15×2=30)**
   (a) Ken
   (b) Modular

L-2/T-2/ARCH **Date : 06/08/2015**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-2 B. ARCH. Examinations 2013-2014

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**.

Use sketches where necessary.

1. "The Great stupa at Sanchi culminates the solution of stupa development" – Explain with necessary sketches. **(23 ⅓)**

2. (a) What is a Chaitya hall? State the construction techniques of cave architecture. **(10)**

   (b) Describe the main features of Karli temple, which is considered as the climax of Chayita hall architecture. **(13 ⅓)**

3. (a) State the evolution of Vedic hut as it took shape with the invasion of Aryans. **(10)**

   (b) Explain the architectural characteristics of a Vedic city. Describe the 'City of Patliputra' as the finest example of a Vedic city. **(13 ⅓)**

4. Write short notes on the following: **(23 ⅓)**

   (a) Frescos of Ajanta and Ellora

   (b) The Great University of Nalanda

   (c) Ashokan Pillar.

SECTION – B

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

5. (a) Describe the evolution of 'Shikhara' in relation with temples. **(14 ⅓)**

   (b) Discuss the architectural characteristics of the Shore Temple as variations of the Dharmaraja theme. **(9)**

6. (a) 'The temple transformed into a fort and the fort evolved into a city' – explain it with reference to the development of South Indian Temples. **(11)**

   (b) State in detail the architectural characteristics of the Great Lingaraja Temple at Bhubaneshwar as one of the finest examples of temple architecture on Indian soil. **(12 ⅓)**

Contd P/2

ARCH 243

7. (a) Outline the principal components of the Sun Temple at Konarale. Show the evidences to justify why it appears to be 'never completed'. **(12 ⅓)**

   (b) Discuss the architectural characteristics of the Great Temple at Tanjore. **(11)**

8. Write short notes on the following: **(23 ⅓)**

   (a) Gopuram

   (b) Ladh Kkan temple

   (c) Vastu-Purusha-Mandala

L-2/T-2/ARCH **Date : 10/08/2015**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-2 B. ARCH Examinations 2013-2014

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. Write short notes on any two from the following: **(2×10)**
   (a) Wind Catcher
   (b) Radiative Cooling
   (c) Simulation tools in early design stage.

2. Discuss the process of heat exchange of buildings using ammotated diagram. Discuss in detail the most effective means of dissipating heat to the atmosphere in the context of humid tropics. **(25)**

3. (a) Write a short note on any one of the environmental heatsinks. Illustrate with sketches ways of preventing overheating in buildings. **(25)**

4. Discuss why tall buildings with exposed glass facades are problematic in the context of Bangladesh. Comment on how such facades should be designed. **(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 the following topics: **(8×3=24)**
   (a) Design of openings in buildings
   (b) Acclimatization
   (c) Courtyards in hot-dry climate

6. (a) Define thermal comfort and comfort zone. **(8)**
   (b) Discuss the heat gain and loss mechanisms of a human in various thermal environments with necessary illustrations. **(15)**

7. (a) Discuss form and planning of a shelter in warm-humid climates with necessary illustrations. **(8)**
   (b) Compare and contrast the environmental conditions of warm-humid and hot-dry desert climates. **(15)**

Contd P/2

ARCH 237

8. (a) Briefly discuss the air flow patterns around buildings. **(8)**

(b) What should be the design considerations of a shelter for Bangladesh? Discuss the form, shading devices and openings with annotated illustrations. **(15)**

L-2/T-2/ARCH **Date : 10/08/2015**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-2 B. ARCH Examinations 2013-2014

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) Define psychology. What are the functions of psychology? **(6)**

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

2. (a) What do you mean by absolute and difference thresholds? **(6)**

   (b) Discuss Gestalt laws of perceptual organization. **(17 ⅓)**

3. (a) What do you mean by motivation? **(6)**

   (b) Describe main theories of emotion. **(17 ⅓)**

4. (a) What are the differences between classical and operant conditioning? **(6)**

   (b) How do we learn from other's experiences according to Bandura's social learning theory? **(17 ⅓)**

SECTION – B

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

5. (a) What is memory? **(6)**

   (b) Delineate the structure of memory. **(17 ⅓)**

6. (a) What is forgetting? **(6)**

   (b) Why do the forget information? **(17 ⅓)**

7. (a) How do Psychology measure IQ? **(6)**

   (b) Describe the theoretical Orientation of intelligence. **(17 ⅓)**

8. (a) What are the Perspectives of personality? **(6)**

   (b) Discuss the "Big Five" model of Personality. **(17 ⅓)**
