

SECTION – A

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

1. (a) What is posture? Describe the procedure to select a basic posture that fits the job with necessary diagrams. (2+6=8)
(b) State the recommendations to establish the effective work environment for a change of posture. (8 1/3)
(c) What are the guidelines to maintain the comfort level for a prolonged hand and arm posture? (7)

2. (a) State the conditions to create the optimum circumstances for lifting. Describe the guidelines to ensure the suitable working environment where manual lifting is necessary. (5+12=17)
(b) What are the recommendations for improving the working environment while carrying activity occurs? (6 1/3)

3. (a) Describe the effective conditions for a reading task. 'The height of the seat and back rest of the chair must be adjustable' – establish the statement with necessary sketches. (6+4 1/3=10 1/3)
(b) State the general principles of ergonomics. Describe few biomechanical principles in terms of posture and movement. (3+10=13)

4. Write short notes on: (8+8+7 1/3=23 1/3)
(a) Silting posture.
(b) Pulling and pushing activities.
(c) Anthropometric background.

SECTION – B

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

5. (a) Which properties play the important role determining the user-population relationship? State the mental model with examples. (7)
(b) Describe the guidelines to improve the field of visual comfort with the help of Ergonomic literature or characters. (16 1/3)

ARCH 601

6. (a) State in detail the measures to be taken to reduce the noise level at source, workplace design and work organization. If the measures fail, how can one conserve the hearing? **(10)**
- (b) State few examples of noise level. What are the guidelines to prevent the damage of hearing or to limit the annoyance in relation to noise level? **(13 1/3)**
7. (a) What are the fundamental measures to be applied to reduce or eliminate the adverse effects of environmental factors? **(4)**
- (b) Describe the guidelines on differences in brightness within the visual field. **(6)**
- (c) Explain the necessary steps to provide efficient light intensity and to avoid excessive brightness. **(13 1/3)**
8. Write short notes on: **(8+8+7 1/3=23 1/3)**
- (a) Diagrams.
- (b) Guidelines in Thermal Comfort.
- (c) Preservation of vibration.
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L-1/T-1/ARCH

Date : 21/08/2017

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-1/T-1 B. Arch. Examinations 2016-2017

Sub : **ARCH 703** (Art Appreciation)

Full Marks : 140

Time : 3 Hours

The figures in the margin indicate full marks.

USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – A

There are **FIVE** questions in this Section. Answer Q. No. 1 and any **THREE** from the rest.

1. Mention the detailed classification of Visual Art with examples. (25)
2. What is Lithography and discuss the process of Serigraphy with examples. (5+10=15)
3. What is the process of Relief in Printmaking? Give a short note on Intaglio process of printmaking. (5+10=15)
4. Describe different types of drawing media. Write short notes on the following painting media (6+9=15)
 - (a) Gouache
 - (b) Acrylic
 - (c) Fresco
5. Write short notes on any **THREE** of the following: (3×5=15)
 - (a) Dry media in Drawing
 - (b) Ceramics
 - (c) Tempera
 - (d) Mixed-media

SECTION – B

There are **FIVE** questions in this Section.

Answer Q. No. 10 and any **THREE (3)** from the rest.

6. How do you appreciate Visual Art? Explain with examples. (15)
 7. Give a short account of the Modern Art Movement in Bengal. (15)
 8. What is Toyism? Describe the brief history and characteristics of Toyism. (15)
 9. What is Computational Art? Describe the process and special features of Computational Art. (15)
 10. Write short notes on any **THREE (3)** of the following: (3×8 1/3=25 1/3)
 - (a) Installation Art
 - (b) Interactive Art
 - (c) Conceptual Art
 - (d) Abstract Art.
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L-1/T-1/ARCH

Date : 21/08/2017

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-1/T-1 B. Arch. Examinations 2016-2017

Sub: ARCH 603 (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 the followings (Any TWO): **(2×10=20)**
 - (a) Thermal comfort
 - (b) Cavity wall
 - (c) Heat exchange of buildings

2. (a) Discuss the following elements of climate: **(15)**
Air Temperature, Relative Humidity, Air Velocity
- (b) How 'Passive Design' can reduce the energy demand of a building? **(10)**

3. How the following factors enhance natural ventilation in buildings? **(25)**
 - (a) Cross ventilation
 - (b) Position of openings
 - (c) Controls of openings

4. What are the three basic types of shading devices? How these devices can be used effectively to minimize the energy need of a building? **(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 (any two): **(2×10=20)**
 - (a) Ground Cooling
 - (b) 'Roof spray' and 'Roof Pond'
 - (c) Evaporative Cooling

6. Discuss the levels of passive solar urban design in terms of: **(25)**
 - (a) Urban Morphology
 - (b) Building Design.

ARCH 603(ARCH)

7. Discuss 'Radiative Cooling' Describe the following cooling strategies: **(25)**

- (a) Radiative Roof
- (b) Air Cooling
- (c) Movable Insulation
- (d) Movable Thermal Mass

8. Discuss strategies to control heat gain through the building envelope in terms of: **(25)**

- (a) Solar Control and Shading systems
 - (b) Thermal insulation
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L-1/T-1/ARCH

Date : 21/08/2017

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-1/T-1 B. Arch. Examinations 2016-2017

Sub : **ARCH 607** (Fire Safety 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 any **THREE**.

1. What are the main causes of an accident? Critique accident sequence and foundation of a major injury. (23 1/3)
2. Prescribe the key parameters of the checklist of fire safety standards of a high rise building, highlighting the non-compliance that is common in the buildings of Dhaka with respect to BNBC. (23 1/3)
3. Assess the significant features of fire safety design for industrial buildings in the context of Bangladesh. (23 1/3)
4. Justify the responsibilities of different occupant groups during emergency evacuations and fire drill for an educational building. (23 1/3)

SECTION – B

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

5. What is fire? Distinguish the principal and methods of fire extinguishment. (23 1/3)
 6. Identify the main reasons of fire incidents. Describe different types of portable fire extinguishers with necessary illustration on how to use. (10+13 1/3=23 1/3)
 7. Critically explain the different features of safety and healthy signalization. (23 1/3)
 8. Write short notes on: (8+8+7 1/3=23 1/3)
(a) Sprinkler system, (b) Fire hydrant, (c) Fire alarm system.
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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** of the following: (10×2=20)
 - (a) Khirou kitia
 - (b) Shaft Mastaba
 - (c) Mechrgarh.

2. (a) Describe the characteristics of a large city of Indus Ghaggar-Hakra civilization with appropriate example. (15)
(b) Discuss the characteristics of the houses of Mohenjo Daro in relationship with the streets. (10)

3. (a) Show the evolution of 'Stone henge' with necessary illustrations. (15)
(b) Describe the salient features of 'Barrow Tomb'. (10)

4. (a) Using 'Mortuary complex of Zoser' as an example, show the different parts of a Pyramid complex with necessary sketches. (15)
(b) Draw a section of the Great Pyramid at Giza and label significant parts of it. (10)

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 of the following (10×2=20)
 - (a) Ashokan Pillar
 - (b) Persepolis
 - (c) Etruscan Temple

6. (a) What are the similarities and differences between the Temple of Queen Hatshepsut and Temple of Abu Simbal in terms of their style and character? (15)
(b) Illustrate the Architectural Features of Egypt during the Ptolemaic period. (10)

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7. (a) Elaborate on the Ritual Complex at Fengchu, Shaanxi Province, China with necessary sketches. (15)
- (b) Describe the characteristics of palaces in China during the Shang Dynasty. (10)
8. (a) How the religious atmosphere in ancient India influenced the “Ghats” during the Vedic period? (15)
- (b) Describe the salient features of Barabar Hill caves with illustrations. (10)
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SECTION – AThere are **FOUR** questions in this Section. Answer any **THREE**.

1. (a) A function $f(x)$ is defined by $f(x) = \begin{cases} x^2, & \text{when } x \leq 0 \\ x, & \text{when } 0 < x < 1 \\ \frac{1}{x}, & \text{when } x \geq 1 \end{cases}$

Discuss the continuity and differentiability of the function at $x = 0$ and $x = 1$.

Also represent them graphically.

(16)

(b) Evaluate $\lim_{x \rightarrow 0} \left(\frac{\sin x - \sin x \cos x}{x^3} \right)$.

(7 1/3)

2. (a) If $y = \ln(x + \sqrt{x^2 + a^2})$, then prove that $(x^2 + a^2)y_{n+2} + (2n+1)xy_{n+1} + n^2y_n = 0$.

(8)(b) Find the maximum and minimum value of the function $4 \sin x \cos^2 x$.**(8)**

(c) If $u = \sin^{-1}\left(\frac{x}{y+z}\right)$, then show that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} + z \frac{\partial u}{\partial z} = 0$.

(7 1/3)

3. Compute the following integrals:

(i) $\int \frac{3x+2}{5x^2+2x+3} dx$

(7)

(ii) $\int \frac{dx}{4+5 \sin x}$

(7 1/3)

(iii) $\int \frac{2 \cos x + 3 \sin x}{4 \cos x - 5 \sin x} dx$

(9)

4. (a) Find the value of the integral $\int_0^1 \frac{\ln(1+x)}{1+x^2} dx$.

(7 1/3)

(b) Evaluate: $\lim_{n \rightarrow \infty} \left[\left(1 + \frac{1}{n^2}\right) \left(1 + \frac{2^2}{n^2}\right) \cdots \left(1 + \frac{n^2}{n^2}\right) \right]^{1/n}$.

(8)

(c) Find the area of a loop of the curve $a^2 y^2 = x^2(a^2 - x^2)$.

(8)

MATH 111(ARCH)**SECTION – B**

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

5. (a) Show that the four points $(5, -1, 1)$, $(7, -4, 7)$, $(1, -6, 10)$ and $(-1, -3, 4)$ form a rhombus. **(11)**
- (b) Show that the straight lines whose direction cosines are given by $2l + 2m - n = 0$ and $mn + nl + lm = 0$ are at right angles. **(12 1/3)**
6. (a) Find the equation of the plane that passes through the point $(2, -3, 1)$ and is normal to the line joining the points $(3, 4, -1)$ and $(2, -1, 5)$. **(11)**
- (b) Show that the equation $2x^2 - 6y^2 - 12z^2 + 18yz + 2xz + xy = 0$ represents a pair of planes and find the angle between them. **(12 1/3)**
7. (a) Find the equation of the line which passes through the point $(1, 2, 4)$ and is parallel to the lines $3x + 2y - z - 4 = 0 = x - 2y - 2z - 5$. **(12)**
- (b) Find the equation of the plane through the line $\frac{x-1}{3} = \frac{y+6}{4} = \frac{z+1}{2}$ and parallel to the line $\frac{x-2}{2} = \frac{y-1}{-3} = \frac{z-4}{5}$. **(11 1/3)**
8. (a) Find the shortest distance and the equation of the shortest distance line between the two lines $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and $\frac{x-2}{3} = \frac{y-4}{4} = \frac{z-5}{5}$. **(12)**
- (b) Find the equation of the sphere for which the circle $x^2 + y^2 + z^2 + 7y - 2z + 2 = 0$, $2x + 3y + 4z - 8 = 0$ is a great circle. **(11 1/3)**
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L-1/T-1/ARCH

Date : 06/08/2017

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-/1T-1 B. Arch. Examinations 2016-2017

Sub : **ARCH 133** (Design Theory)

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

1. Explain different types of texture. Describe the effect and use of Texture in the realm of visual art and Architecture. (8+12=20)

2. Discuss color wheel and the use of color wheel in visual art. Explain Hue, value, intensity and describe what is primary, secondary and tertiary color. (10+10=20)

3. Illustrate with sketches, the inherent character of these forms: (4×5=20)
 - (a) Square and Cube
 - (b) Rectangle
 - (c) Triangle
 - (d) Free form

4. Write short notes on the following (3×10=30)
 - (i) Balance and Harmony
 - (ii) Warm color and Cool color
 - (iii) Hierarchy and Unity

SECTION – B

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

5. What are the types of Additive form? Describe them with necessary sketches. (20)

 6. How 'L-shaped plane' and 'U-shaped plane' as vertical space defining element, define spaces? Explain them with sketches. (20)

 7. Explain how spaces are organized centrally and linearly. (20)

 8. Write short notes on the following: (15×2=30)
 - (a) 'DOT' as primary element in architecture.
 - (b) Platonic solids.
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