Khulna University of Engineering and Technology

Department of Architecture

B.Arch 1st Year 1st Term Regular Examination, 2019

Arch 1131- Architecture of Ancient Civilization

Full Marks: 210 Time: 3 Hours

N.B i) Answer any three questions from each section in separate script.

ii) Figures in the right margin indicate full marks.

Section A

1. a. Analyze and discuss Mastaba with necessary illustrations. 15
   b. Elucidate the Temple of Abu Simbel with illustrations. 20

2. a. Illustrate your understanding with drawings about the Great Pyramid of Gizeh. 10
   b. Identify the significance of Theban Necropolis 10
   c. Draw typical temple of ancient Egyptian Architecture 15

3. a. Interpret your understanding about the context of Mesopotamian architecture highlighting geological, climatic and religious aspects. 15
   b. Discuss the Ziggurat of Urnammu at Ur with necessary drawings 20

4. a. Describe with drawings, the Ziggurat of White Temple at Warka. 15
   b. Interpret and discuss the city of Khorshabad with necessary illustrations. 20

Section B

1. Write short notes on : 7x5 = 35
   i. Hellenic Period
   ii. Ionic Order
   iii. Doric Order
   iv. Roman Urban Design
   v. Propylaea

2. a. Discuss with drawing- The Pantheon, Rome . 20
   b. Critically interpret Geographical, Geological and climatic aspects of Greece. 15

3. a. Evaluate and discuss Agora with drawings. 15
   b. Interpret your understanding on Parthenon with Drawings 20

4. write short notes on: 7x5=35
   a. Roman Forum
   b. The Forum Romanum
   c. The Forum of Trajan
   d. Corinthian Order
   e. Amphitheatre

Khulna University of Engineering and Technology

Department of Architecture

B.Arch 1st Year 1st Term Regular Examination, 2019

Arch 1133- Design Theory

Full Marks : 210 Time : 3 Hours

N.B i) Answer any three questions from each section in separate script.

ii) Figures in the right margin indicate full marks.

Section-A

1. a. As a primary element, how a Point can influence a visual field? Explain. 05
   b. How linear elements have been used in architecture according to their visual expression and functionality? Discuss with example. 15
   c. Discuss Overhead Plane in brief with necessary examples and illustrations. 15

2. a. State seven visual properties of form with examples. 15
   b. What do you understand by Articulation of Form? Discuss Corner Articulation in brief with necessary examples and illustrations. 20

3. a. What do you understand by subtractive transformation? Give example of an architect's work. 10
   b. Discuss clustered form in brief. 10
   c. What are the reasons behind Formal Collisions of Geometry? Give examples. 15

4. a. How L-shaped plane define a field of space? State with examples. 15
   b. How openings can be arranged with planes? Discuss with examples. 20

Section-B

1. a. Discuss various types of Spatial Relationship in brief. 20
   b. Discuss Centralized Organisation in brief with an example from Bangladesh. 15

2. a. What do you understand by Frontal Approach? 05
   b. Distinguish among Flush, Recessed and Projected entrances 10
   c. Discuss various forms of circulation space and their effects on our Perception, Movement and Activities through a space. Give an example of Enclosed Circulation. 20

3. Write short notes on: 3x10= 30
   a) i. Golden Section
      ii. Modular
      iii. Ken
   b) Define scale. 05

4. a. What is Order? Outline the principles that can be utilized to create Order in an architectural composition. 05
   b. What is Axis? Discuss various terminating elements of an Axis. 15
   c. What is Symmetry? Discuss various types of Symmetry in brief. 15

Khulna University of Engineering and Technology

Department of Architecture

B.Arch 1st Year 1st Term Regular Examination, 2019

Course no: Phy 1125 Course title: Physics

Full Marks: 210 Time: 3 Hours

N.B i) Answer any three questions from each section in separate script.

ii) Figures in the right margin indicate full marks.

Section-A

1. a) Establish the differential equation of simple harmonic motion and solve it to obtain an expression for the displacement. 12

b) Show that the energy of a plane progressive wave is given by $E = 2\pi^2 \rho \gamma^2 \alpha^2$, where the symbols have their usual meanings. 13

c) A simple harmonic motion is represented by by $Y = 12 \sin\left(\frac{12\pi t}{10} + \frac{\pi}{3}\right)$, where Y is measured in meter, t in seconds and the phase angle in radian. Calculate (i) The frequency (ii) The time period (iii) The maximum displacement (iv) The maximum velocity and (v) The maximum acceleration. 10

2. a) Obtain the following differential equation of wave motion, $\frac{d^2y}{dt^2} = v\,\frac{d^2y}{dx^2}$ 10

b) What is Doppler's effect in sound? Obtain an expression for the apparent frequency of a note when the source and listener are, (i) Moving towards each other. (ii) Moving away from each other. 15

c) Two aeroplanes A and B are approaching each other and their velocities are 500 km/hr and 700 km/hr respectively. The frequency of the note emitted by A as heard by the passengers in B is 1100 Hz. Calculate the frequency of the note as heard by the passengers in A. Velocity of sound in air =340 m/s 10

3. a) What are the acoustic requirements for a good auditorium? Discuss the factors influencing loudness. 10

b) Explain what are meant by acoustic intensity level and acoustic pressure level. Define the terms. (i) Threshold of feeling (ii) (i) Threshold of hearing (iii) Noise reduction (iv) Band power level and (v) Sone 15

c) Calculate the (i) acoustic intensity, (ii) acoustic pressure of a plane, acoustic wave in air of intensity level of 85 decibels reference to 10^{-12} watt/m^2. 10

4. a) What is ultrasonic wave? Mention its application. 10

b) What is Weber-Fetchner law? Derive an expression for intensity of an acoustic wave. 15

c) If a concert hall of size 80X60X40 cu.ft has plastered surface of absorption co-efficient 0.12 and a capacity of an audience of 140 adults (each having an absorption of 4.6ft^2 own). Find the reverberation time of the hall. 10

Section-B

5. a) What are the common defects in the images produced by a single lens? How can these defects can be removed? 15

b) Show that the equivalent focal length of two thin lenses separated by a finite distance is equal to $f = \frac{f_1 f_2}{f_1 + f_2 - d}$, where the symbols have their usual meanings. 10

c) The two thin lenses of focal length f_1 and f_2 separated by a distance'd' have an equivalent focal length 60 cm. The combination satisfies the conditions per no chromatic aberration and minimum spherical aberration. Find the values of f_1, f_2 and d. 10

6. a) Define the following terms, (i) Unpolarised light (ii) Polarised light (iii) Ordinary rays (iv) Extraordinary rays and (v) Optical activity 15

b) Explain Brewster's law. Show from this law that when light is incident on a transparent substance at a polarizing angle, the reflected and refracted rays are at right angles. 10

c) If the plane of vibration of the incident beam makes an angle of 30^0 with the optic axis, compare the intensities of extraordinary and ordinary light. 10

7. a) What is Nichol prism? How can it be used as a polarizer or as an analyser? 12

b) Define additive colour mixture. How can be determined three colour mixture data for matching spectrum colours? 13

c) Define primary colour and secondary colour. Explain the formation of white colour with colour triangle. 10

8. a) What is photometry? Discuss luminous intensity and illumunance of a light source and hence deduce the inverse square law. 15

b) Define luminous power? State and explain the Lambert's law of light 10

c) Correct exposure for a photographic print is 10 seconds at a distance of 1 foot from a 20 C.P lamp, for how many seconds will you expose the print at a distance of 2 feet from 16 C.P lamp to obtain an equally satisfactory result? 10

Khulna University of Engineering and Technology

Department of Architecture

BArch. 1st Year 1st Semester Regular Examination, 2019

Course no: Hum 1125 Course title: Communicative English

Full Marks: 210 Time: 03 Hours

N.B i) Answer any three questions from each section in separate script.

ii) Figures in the right margin indicate full marks.

Section-A

Question-01

a) Make sentence with the following structures using the words given in brackets. 14

I) Subj.+ Intransitive Verb+ Adverb. (Walk as verb)

II) Subj.+ Transitive Verb+ Object. (Write as verb)

III) That+ Subj. + Verb+ Adv.+ Verb + Adj. Complement. (Work and is as verb)

IV) As+ Subj. + Verb +Adv., Subj.+ Verb+ Adv. (Study and is as verb)

V) Subj.+ Verb+ Adj. Complement, but+ Verb+ Adv. (Is and fail as verb)

VI) Neither+ Subj.+ nor+ Subj.+ Verb+ Adv. (Attend as verb)

VII) Subj. + Verb + Adv.+ that+ Subj.+ Verb+ Adv. (Work and progress as verb)

b) Change the following words as asked in brackets and use the changed forms in sentence. 12

Generous (into noun), Prevention (into adj.), Fluency (into adj.), Type (into verb),

Little (into verb), Curious (into noun).

c) Make new words with the following prefixes and use the new words in sentence. 09

Be_____, Cu_____, Mini_____, Out_____, Patri_____, Tele_____.

Question-02

a) Make Wh question with the underlined words in the following sentences. 14

I) Hamid is five feet and six inches tall.

II) Labu drives car at a speed of 25 Kph.

III) The river is much deep.

IV) She is much talented.

V) He comes hardly here.

VI) Liza met us two days ago.

VII) Hasan has been reading for three hours.

b) Make use of the following words in sentence as asked in brackets. 12

Grass (as verb), Baby (as verb), Access (as verb), Tea (as adj.), Back (as verb),

Cloud (as verb)

c) Write two antonyms for each of the following words and use the antonyms in sentence. 09

Industrious, Attentive, Honesty

Question-03

a) Transform the following sentences as directed: 14

I) Only Allah can help us. (Negative)

II) Everybody loves music. (Interrogative)

III) I wish I had the wings of a bird. (Exclamatory)

IV) She heard a song and woke up. (Simple)

V) He is too busy to come here. (Compound)

VI) I lived in a house belonging to my uncle. (Complex)

VII) The door was knocked at. (Active)

b) Make use of the following modals in sentence as asked in brackets. 12

I) Must. (To express certainty)
II) Can. (To allow someone else for something)
III) Could. (To express past ability)
IV) Would. (To express past irregular habit)
V) Be+ to+ base form of verb. (To express an arrangement)
VI) Must. (To express logical deduction)

c) Complete the following sentences with clauses as asked in brackets. 09

I) _____ is certain. (Noun clause)
II) Mili regards _____. (Noun clause)
III) Rabu, _____, is a teacher. (Adj. clause)
IV) He studies in a college, _____. (Adj. clause)
V) _____, he can succeed in life. (Adv. clause)
VI) _____, he could play football. (Adv. clause)

Question-04

a) Correct the following sentences. 14

I) The hard-working man can develop life.
II) He plays guitar.
III) When he is ill, ha can't study well.
IV) Mitu speaks a lie.
V) He what says is true.
VI) The watch is out of repairs.
VII) Liza gave false witness.

b) Express the following notions/ functions in sentence. 12

I) Regrets, II) Sympathy, III) Congratulations, IV) Tension, V) Joy, VI) Honesty.

c) Define Gerund, present participle and Infinitive with two examples for each of the definitions. 09

Section-B

Question-05

a) Read the passage and answer the questions that follow. 15

The man who is always hesitating which of the two things he will do first will do neither. The man who resolves, but allow his resolution to be changed by the counter-suggestion of a friend- who changes from opinion to opinion, from plan to plan, and turns like a weather-cock to every point of compass with every breath- can never accomplish anything great or useful. It is only the man who first consults wisely, then resolves firmly, and then executes the purpose with perseverance in the face of whatever difficulties may come in the way, - that can advance to any line. Take your course wisely, but firmly; and having taken it, hold to it with resolution, and the Alps and the Himalayas will sink before you.

Questions:

I) How does a man always hesitating behave and fare in life?
II) What kind of people succeed in life?
III) What is the author's advice to the young?

b) Make a précis of the above passage (Q 5.a) with a suitable title. 20

Question-06

a) Write a contrast paragraph between private university and public university. 15

b) Amplify the idea contained in of the following statement. 20

Procrastination is the thief of life.

Question-07

a) Write a letter to the editor of a newspaper commenting on miserable condition of the people of a flood affected area in Bangladesh. 15

b) Write a formal report on the central library of KUET. 20

Question-08 35

Write a free composition on one of the followings.

a) Global warming

b) Industrialization and social disharmony

B. Arch 1st Year 1st Term Regular Examination 2019

Department of Architecture

Math 1125- Mathematics

Full MARKS 210 Time 3 Hrs.

N.B Figures in the right margin indicate full marks.

Answer any three questions from each section in separate scripts.

Section – A

1(a) Define continuity of a function at a point. 15
Discuss the continuity and differentiability of the function $f(x)$ at $x = -1$, where

$$f(x) = \begin{cases} 2x+1 \ ; \ x \geq 0 \\ 1 \quad ; -1 \leq x < 0 \\ -1-2x \ ; \ x < -1 \end{cases}$$

1(b) If $y = \frac{x}{x^2-3x-4}$, then find y_n. 10

1(c) Find the maxima and minima of the function $f(x) = 1 + 2sinx + 3cos^2x$ $in\ 0 \leq x \leq \frac{\pi}{2}$. 10

2(a) If $(tanx)^y + (cosx)^{siny} = x + y$, find $\frac{dy}{dx}$. 12

2(b) Write the statement of Leibnitz's theorem. If $y = (x^2-1)^n$, then show that 12
$(x^2-1)y_{n+2} + 2xy_{n+1} - n(n+1)y_n = 0$.

2(c) If $u = \frac{1}{r}$ and $= \sqrt{x^2+y^2+z^2}$, then find the value of $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + z\frac{\partial u}{\partial z}$. 11

3 Evaluate any three of the followings: 35

(a) $\int \frac{3x+2}{5x^2+2x+3}\,dx$.

(b) $\int \frac{dx}{(1-x)\sqrt{1+x}}$.

(c) $\int \frac{3cosx+5sinx}{2sinx-4cosx}\,dx$.

4(a) Find the area of the region between x axis and the graph of $f(x) = x^3 - 3x^2 + 2x$ in 12
$0 \leq x \leq 2$.

4(b) Evaluate $\int_0^{\frac{\pi}{2}} \frac{x}{cosx+sinx}\,dx$. 11

4(c) Find the area enclosed by the parabola $y^2 = 8x$ and the straight line $4x - y - 4 = 0$. 12

Section – B

5(a) Find the spherical and cylindrical polar co-ordinates for the point $(1, -3, -2)$. 10

5(b) Find the ratio in which the xy-plane divides the joint of the points $(-1, 2, 3)$ and 10
$(2, 5, -4)$ and also find the co-ordinates of the point of intersection.

5(c) Define direction cosines and direction ratios of a line. Find the direction cosines of the 15
two lines which are given by the relations $2l + 2m - n = 0$ and $lm + mn + nl = 0$. Also show that the lines are perpendicular to each other.

6(a) Test whether the lines $\frac{x-2}{1} = \frac{y+5}{-3} = \frac{z}{2}$ and $\frac{x+3}{2} = \frac{y-1}{4} = \frac{z+6}{-1}$ are coplanar or not. If coplanar, then find the equation of plane, otherwise, find the shortest distance between two lines. 16

6(b) Find the equation of the plane through $(2,3,-4)$ and $(1,-1,3)$ and parallel to the x-axis. 10

6(c) Find the equation of the plane through the line $\frac{x-2}{3} = \frac{y-3}{5} = \frac{z}{7}$ and passing through the point $(1,-3,4)$. 09

7(a) Find the distance of the point $(1,2,3)$ from the plane $2x + 4y + 3z = 20$ measured parallel to the line $\frac{x}{2} = \frac{y}{-2} = \frac{z}{1}$. 10

7(b) Find the symmetrical form of the equation of the line $3x + 2y - z - 4 = 0 = 4x + y - 2z + 3$ and find its direction cosines. 11

7(c) Find the length and equation of the shortest distance between the lines $\frac{x-2}{1} = \frac{y+3}{2} = \frac{z-5}{4}$ and $\frac{x-5}{2} = \frac{y-2}{3} = \frac{z-7}{5}$. 14

8(a) Find the centre and radius of the circle $x^2 + y^2 + z^2 - 2y - 4z - 11 = 0,\ x + 2y + 2z = 10.$ 12

8(b) Show that the plane $2x - 2y + z + 12 = 0$ touches the sphere circle $x^2 + y^2 + z^2 - 2x - 4y + 2z - 3 = 0$ and find the point of contact. 12

8(c) Find the equation of the sphere whose centre is $(2,1,-3)$ and tangent to the plane $2x - 4y + 5z = 0$ 11