

Khulna University of Engineering & Technology  
Department of Urban and Regional Planning  
BURP 1<sup>st</sup> Year 1<sup>st</sup> Term Regular Examination, 2023

**URP1113**  
(Fundamentals of Planning Process)

Full Marks: 210

Time: 3.00hrs

- N.B.** i) Answer any THREE questions from each section in separate scripts.  
ii) Figures in the right margin indicate full marks.

**Section – A**

1. (a) Discuss how urban planning is related to social, economic, and physical environmental aspects. (10)  
(b) What is a primate city? Write down the advantages and disadvantages of primate cities? (10)  
(c) Briefly narrate the necessity of Urban Planning with examples in context of Bangladesh. (15)
2. (a) Briefly explain the terms: project, program, policy, proposal, and strategy with relevant examples in the context of urban planning. (15)  
(b) What is an urban development plan? Discuss the different forms of urban development plans. (20)
3. (a) Why is your city different from other cities in terms of layout, size, and scenic beauty? Briefly discuss the planning factors with relevant examples. (15)  
(b) Describe the major functions of Planning Commission. (10)  
(c) Describe different types of institutional linkages of the Planning Commission with other ministries, divisions, or organizations. (10)
4. (a) Suppose you are working as a planner in Khulna City Corporation. The City Corporation needs to plan a drainage system for Khulna City. Discuss the stages of the conventional planning process for the above-mentioned scenario. (20)  
(b) Draw the ladder of citizen participation and explain the stages. (15)

**Section – B**

5. (a) "Planners' roles have changed in different ways from the beginning of planning till now"- Provide a brief overview of that scenario. (12)  
(b) What is "Top down" and "Bottom up" Approach in planning? List the different planning theories based on the "Top down" and "Bottom up" approaches. (08)  
(c) What are the key geographical and social factors that influence urban planning in Bangladesh? How can urban planners effectively incorporate these geographical and social factors into the development of a new urban area in Bangladesh? (15)
6. Advocacy planning contends that the planner should be engaged in the political process and be an advocate for what he deems proper, representing and pleading the plans of different interest groups including the government.  
Based on the aforementioned statement answer the following questions.

- (a) What do you understand about Advocacy Planning? (08)
  - (b) In the context of Bangladesh, how can planners balance the interests of different groups while advocating for equitable urban development? (12)
  - (c) Design a theoretical advocacy planning approach/process for a specific urban issue in Bangladesh, emphasizing the integration of diverse interest groups and ethical representation. (15)
7. (a) "Transactive Planning is a process of mutual learning"- Identify the contribution of planner and client here. (12)
- (b) "Sometimes the population may not be prepared to plan for the long run and thereby to postpone short-term satisfaction"- Explain this with an example. (08)
- (c) Describe key principles in building a successful public involvement program through Transactive Planning. (15)
8. (a) What is Sustainable Planning? How imbalance between economic growth and environmental considerations create resource conflict? Explain with an example. (10)
- (b) Explain major tasks of Advocacy Planning process with an example/case study. (10)
- (c) Explain the concept "SITAR" in planning theory. Provide a short overview of each planning approaches used in SITAR model. (15)

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BURP 1<sup>st</sup> Year 1<sup>st</sup> Term Examination, 2023.  
Math 1117  
(Mathematics - I)

Full Marks: 210

Time: 3.00 hrs

- N.B.** i) Answer any THREE questions from each section in separate scripts.  
ii) Figures in the right margin indicate full marks.

**Section – A**

1. (a) Find the distance of the point whose spherical polar coordinates are  $(2\sqrt{2}, \frac{1}{4}\pi, \frac{1}{6}\pi)$  from the point whose cartesian coordinates are  $(2\sqrt{3}, -1, -4)$ . (10)
- (b) Define direction ratio and direction cosines of a line. Find the length of the line whose projection on the axes are respectively 3, 2, and 6. Also find the angles made by the line with the coordinate axes. (12)
- (c) If  $(l_1, m_1, n_1)$ ,  $(l_2, m_2, n_2)$  and  $(l_3, m_3, n_3)$  are the direction cosines of three mutually perpendicular lines then show that the line whose direction cosines are proportional to  $l_1+l_2+l_3$ ,  $m_1+m_2+m_3$ , and  $n_1+n_2+n_3$  makes equal angle with them. (13)
2. (a) Find the equation of the plane through the line of intersection of the planes  $ax+by+cz+d=0$  and  $a'x+b'y+c'z+d'=0$  and perpendicular to the  $zx$ -plane. (10)
- (b) A plane meets the coordinate axes in A, B, C such that the centroid of the triangle ABC is the point  $(p, q, r)$ , show that the equation of plane is  $\frac{x}{p} + \frac{y}{q} + \frac{z}{r} = 3$ . (12)
- (c) Find the length of shortest distance between the lines  $\frac{x-1}{4} = \frac{y+1}{-1} = \frac{z-4}{0}$  and  $\frac{x-1}{4} = \frac{y-2}{3} = \frac{z-36}{-6}$ . (13)
3. (a) Find the distance of the point  $(-1, -5, -10)$  from the point where the line  $\frac{1}{3}(x-2) = \frac{1}{4}(y+1) = \frac{1}{12}(z-2)$  meets the plane  $x-y+z=5$ . (10)
- (b) Find the angle between the line of intersection of  $2x-3y+4z-5=0$  and  $3x+4y-5z-7=0$  with  $x+y-z+3=0$ . (12)
- (c) Show that the equation to the right circular cone whose vertex is at the origin, whose axis has direction cosines  $\cos\alpha$ ,  $\cos\beta$ ,  $\cos\gamma$  and whose semi-vertical angle is  $\theta$  is  $(y\cos\gamma - z\cos\beta)^2 + (z\cos\alpha - x\cos\gamma)^2 + (x\cos\beta - y\cos\alpha)^2 = (x^2 + y^2 + z^2) \sin^2 \theta$ . (13)
4. (a) Explain (i) great circle (ii) prime meridian (iii) geodesic (iv) spherical triangle. (12)
- (b) Determine the great circle distance between two cities, Dhaka ( $23^\circ 44'N$ ,  $0.24^\circ E$ ) and Tokyo ( $35^\circ 40'N$ ,  $139^\circ 45'E$ ) in nautical miles. (13)
- (c) Define spherical triangle. The parts of a spherical triangle are  $a = 56^\circ 40'$ ,  $B = 96^\circ 47'$  and  $C_A = 90^\circ$ , find the remaining parts. (10)

**Section – B**

5. (a) Define Skew-symmetric matrix, Skew hermitian matrix and orthogonal matrix with example. (10)
  - (b) Show that every square matrix can be uniquely expressed as the sum of symmetric and skew symmetric matrix. (13)
  - (c) Verify the rule  $(AB)' = B'A'$  where (12)
- $$A = \begin{bmatrix} 1 & 1 & 1 \\ 2 & 2 & 3 \\ 2 & 4 & 9 \end{bmatrix} \text{ and } B = \begin{bmatrix} 0 & 1 & -1 \\ -3 & 2 & 4 \\ 1 & 1 & 0 \end{bmatrix}$$

6. (a) If  $A = \begin{bmatrix} 1 & -1 & 1 \\ 2 & -1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ , Find  $A^2$  and show that  $A^2 = A^{-1}$ . (12)
- (b) Find the value of a, b and c if the matrix (11)
- $$A = \begin{bmatrix} 0 & 2b & c \\ a & b & -c \\ a & -b & c \end{bmatrix}$$
- is orthogonal.
- (c) Reduce the matrix  $A = \begin{bmatrix} 1 & -1 & 1 & 1 & 1 \\ 1 & -1 & 2 & 3 & 1 \\ 2 & -2 & 1 & 0 & 2 \\ 1 & 1 & -1 & -3 & 0 \end{bmatrix}$  to its normal form and find its (12)
- rank.
7. (a) Define the rank of a matrix. Find the rank of the matrix (12)
- $$A = \begin{bmatrix} 0 & 1 & 0 & -1 \\ 1 & 0 & 1 & -1 \\ 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix}$$
- (b) For what value of  $\lambda$  the equations  $x + y + z = 1$ ,  $x + 2y + 4z = \lambda$ ,  $x + 4y + 10z = \lambda^2$  has a solution and solve them completely in each case. (13)
- (c) Apply the elementary row transformation, find the inverse of the following matrix (10)
- $$A = \begin{bmatrix} 2 & 4 & 3 & 2 \\ 3 & 6 & 5 & 2 \\ 2 & 5 & 2 & -3 \\ 4 & 5 & 14 & 14 \end{bmatrix}$$
8. (a) Reduce the equation  $f(x, y) = 8x^2 + 4xy + 5y^2 - 24x - 24y = 0$  to the (15)
- standard form and find its center, focus, and equations of latus rectum.
- (b) Show that the equation  $12x^2 + 2y^2 - 10xy + 11x - 5y + 2 = 0$  can be reduce (10)
- to a homogeneous equation of second degree by transformation to the origin to property chosen point.
- (c) Explain the different types of hyperbolic function with their graph. (10)

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**Hum 1117**  
(Functional English)

Full Marks: 210

Time: 3.00 hrs

- N.B.** i) Answer any three questions from each section in separate script.  
ii) Figures in the right margin indicate full marks.  
iii) Assume reasonable value for any missing data.

**Section – A**

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

- i) Subj.+ Intransitive Verb + Adv. Of manner. (Walk as verb)
- ii) Subj.+ Transitive Verb +Object. (Read as verb)
- iii) That+ Subj.+ Verb + Adv. Of manner +Verb+ Adj. Complement. (Work and is as verb)
- iv) Subj.,+ Relative Pronoun + Verb + Adj.Complement + Verb+ Adv. Of Place. (is and work as verb)
- v) Neither + Subj.+ nor+ Subj. + verb + Adv. Of manner. (Behave as verb)
- vi) Since + Subj.+ Verb + Adv. Of manner, Subj. +verb + Adj. Complement (Work and is as verb)
- vii) Though + Subj.+ Verb + Adv. Of manner, Subj. +verb + Adv. Of place (Study and fail as verb)

- (b) Change the following words as asked in brackets and make sentence with the changed forms. (12)

Acuity (into adj.), Health (into adj.), Latency (into adj.), Repression (into verb), interruption (into verb), Notification (into verb)

- (c) Make new words with the following suffix, prefix, and use them in sentence: (09)  
\_ive, \_wise, Ultra\_, For\_, \_ly, Be\_.

- 2 (a) Transform the following sentences as per instruction. (14)

- i) Jamil is rich but honest. (Complex)
- ii) Did you never hear that name? (Passive)
- iii) He is better than me. (Negative)
- iv) Usha Kiran is not taller than some other buildings in the city. (Superlative)
- v) We must eat to live. (Compound)
- vi) Make haste, or else you will be late. (Simple)
- vii) Cain, being jealous of Abel, Strck him. (Complex)

- (b) Use the following words in sentences as per instruction. (12)  
Table (as verb), All (as pronoun), Alone (As adj.), Long (as adv.), Fast (as noun), Master (as adj.)

- (c) Build sentence for each of the following word's antonym. (09)

Urban, Harmony, Amplification, Sinister, Lean, Aimless

- 3 (a) Make WH-questions with the underlined portions. (14)

- i) Gluttony is one of the seven deadly sins.
- ii) Ms. Marvel is the first ever superhero representing brown muslim girls.
- iii) Rani owed her success to her mother.
- iv) Taj went to the movies with Neel.
- v) The film is about crime and punishment.
- vi) Doolittle's definition of middle class mortality brutally criticised the society.
- vii) Ron Weasley comes from a closely kintted family.

(b) Fill in the gaps with appropriate clause as instructed below. (12)

- i) Boys \_\_\_\_ will not be promoted. (Adj. clause)
  - ii) He met a girl \_\_\_\_\_. (Adj. clause)
  - iii) The boy went out to play \_\_\_\_\_. (Adv. clause)
  - iv) Do not go \_\_\_\_\_. (Adv. clause)
  - v) I expect \_\_\_\_\_. (Noun clause)
  - vi) \_\_\_\_\_ is quite certain. (Adj. clause)
- (c) Complete the following sentence with suitable phase. (09)

- i) I like to see a \_\_\_\_\_. (Adj. phrase)
- ii) The child replied with \_\_\_\_\_. (Adj. phrase)
- iii) \_\_\_\_\_ is a good maxim. (noun phrase)
- iv) I agree \_\_\_\_\_. (Adv. phrase)

4 (a) Correct the following sentences. (14)

- i) Mim is coward.
  - ii) Simanta will arrive at station at 8.00 p.m.
  - iii) As you come in our occassion, we will feel happy.
  - iv) Not only Rani will attend at the meeting but also shimrs.
  - v) Shova bought a pair of spectacle.
  - vi) He has a business.
  - vii) The lady has curly hairees.
- (b) Make use of the following models in sentence as asked in brackets. (12)

- i) can. ( to express ability)
  - ii) would. (To express a polite request)
  - iii) used to. (To express a past regular habit)
  - iv) would rather. (To express preference)
  - v) had better. (To express a duty at present)
  - vi) Had better. (To express a duty at present)
  - vii) Should + have + past participle of verb. (To express a past action on not discharged)
- (c) Express the following notions and functions in sentence. (09)
- i) Unhappiness, ii) Determination, iii) Wish, iv) Love, v) Tension vi) Sympathy

### Section – B

5 (a) Read the following passage carefully and answer the questions that follow: (20)

We often do many activities, but frequently never think of the consequence, the activities either can or may bring in our life. Commonly many ones of our society lead our life thus, not everyone. The world only centuries for the activities of humans, no where else. All activities, humans do, are done in the world for a purpose; the purpose rests upon development, otherwise not. So, Calvin Coolidge says: "All growth depends upon activity. There is no development physically or intellectually without effort and effort means work". Any activities, human think to perform, should be considered how far it is good for the world, not bad; if bad, it is avoided at any cost. All sensible humans wish his philosophy in the depth of their heart and soul. Michavel Angyle so says, "For happy people this's filled and planned". How is it? As they involve themselves in activities plannedly, consequentially perform the activities and become finally happy. Despite the fact there are some civil activities in life of some people, there are done but not thought having any good result. Sometimes the consequences are so shameful that they cannot show their face in society, but even a single moment they could not feel that this psychically pathetic scenery would reach their life at the time-they did. At this time of life, they become dumb-founded with the result of their conscience. We can remember the idea of Norman Cousins- "Wisdom consists of the anticipation of consequences". We lost our sense at that time. But had it not been!

Questions:

- i) How do many of humans live in the world?
  - ii) What is the world and what do humans do here?
  - iii) How are people happy with their activities?
  - iv) What is the result of some civil actions and why is this in the doer?
- (b) Make a precise of the above written passage (5. (a)) with a suitable title. (15)
- 6 (a) Amplify the idea- "How far that little candle throws its beam, so shines a good deed in a naughty world." (20)
- (b) Write a paragraph on hatred. (15)
- 7 (a) Write a newspaper report on drinking water scarcity in Khulna. (20)
- (b) Prepare a CV along with an application for a job. (15)
- 8 (a) Write a free composition on the following: (35)  
Pollution free Urbanization

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BURP 1<sup>st</sup> Year 1<sup>st</sup> Term Regular Examination, 2023

**Ch 1117**

(Environmental Chemistry)

Full Marks: 210

Time: 3.00 hrs.

- 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) "The reactivity of alkali metals increases down the group." What are the reasons for this. (08)
- (b) Explain the apparent anomalous properties of lithium in relation to other alkali metals. (09)
- (c) "Basic strength and solubility of alkaline earth metals increase down the group"- Explain. (10)
- (d) What are the reasons for less reactivity of transition metals compare to alkali and alkaline earth metals. (08)
- 2 (a) Discuss the stability of nucleus in terms of neutron-proton ratio and binding energy. (11)
- (b) "Fusion as a source of energy in 21<sup>st</sup> century"- Why fusion is preferred over fission. (09)
- (c) A bone taken from a garbage pile buried under a hill-side had  $^{14}\text{C}/^{12}\text{C}$  ratio 0.477 times the ratio in a living animal. What was the date when the animal was buried. (09)
- (d) How radioisotopes are important in medicine? (06)
- 3 (a) What is bond order? Indicate the relationship of bond order with the properties of molecules. (09)
- (b) How the molecular orbital theory explains the magnetic behavior of oxygen. (09)
- (c) With the help of a diagram discuss the generation of electricity with the help of a nuclear reaction. (10)
- (d) Xenon has a much higher boiling point than Neon. Explain the origin of intermolecular forces in these elements. (07)
- 4 (a) What is nuclear binding energy? The measured mass of deuterium  $^2_1\text{H}$  is 2.01402u. Calculate the binding energy of this atom. (10)
- (b) " $\text{N}_2$  is diatomic but Ne is monoatomic"- Explain with help of MOT. (10)
- (c) What is nuclear 'magic numbers'? Explain nuclear potential wells for neutron and proton. (10)
- (d) How is hydrogen bonding affect the physical properties of compounds? (05)

**Section – B**

- 5 (a) What are free radicals? Describe the factors that determine the stability of the free radicals. (09)



- (b) Complete inversion of configuration is observed in SN2 reaction – Justify it. (09)
- (c) “Bromine addition to alkene always follows a two-step pathway instead of one-step” Write the evidences behind the statement. (10)
- (d) Write the mechanism of Aldol condensation reaction. (07)
- 6 (a) What are polymers? What are the monomers of nylon-6,6? How do these monomers form nylon-6,6 polymer. (08)
- (b) Show the three steps of free-radical polymerization for the formation of PVC and polystyrene from their respective monomers separately. (10)
- (c) What are living polymers? Show the mechanism of cationic polymerization. (09)
- (d) What is conducting polymer? What are the conditions of a polymer to become conductive. (08)
- 7 (a) Briefly describe the segments of environment. (10)
- (b) What are the major components of the atmosphere? Illustrate the Nitrogen cycle. (09)
- (c) How would you broadly divide the major regions of the atmosphere? Graphically represent the temperature profile of the regions. What are the important chemical species in each region? (10)
- (d) What are the differences between BOD and COD? (06)
- 8 (a) What are primary air pollutants? Draw the catalytic converter for treating auto emissions. (10)
- (b) Illustrate the pathway for domestic waste water treatment. (10)
- (c) What are greenhouse gases? What would have happened if the greenhouse gases are totally missing in the earth atmosphere? (08)
- (d) “Oxygen plays a key role in the troposphere while ozone in the troposphere.” Explain. (07)

Khulna University of Engineering & Technology  
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BURP 1<sup>st</sup> Year 1<sup>st</sup> Term Regular Examination, 2023  
**URP 1111**  
(History/Evolution of Human Settlement)

Full Marks: 210

Time: 3.00 hrs.

- N.B.** i) Answer any three questions from each section in separate script.  
ii) Figures in the right margin indicate full marks.  
iii) Assume reasonable value for any missing data.

**Section – A**

- 1 (a) Explain the cause for the following: i) Trade, ii) Agriculture, iii) Social Hierarchies (15)  
(b) Describe Stonehenge and its uses. (10)  
(c) List at site factors of settlement. Diagrammatically represent the various stages in the evolution of human settlement. (10)
- 2 (a) Describe the push and pull factors that occur in rural and urban areas. (10)  
(b) Classify town based on function and rural settlements on pattern. (15)  
(c) What are the bases of classifying a settlement as urban around the world? (10)
- 3 (a) Draw a “Pizza Slice” of the Garden City with labels. What were the problems with implementation? (15)  
(b) Briefly discuss the concept of the 3 Magnet Theory. (05)  
(c) Describe the Vertical City of Le Corbusier. Also write about the street system in the Plan Voisia. (15)
- 4 (a) Briefly elaborate on the Linear City Concept and provide a suitable example. (10)  
(b) “The growth and development of human settlement in Ancient Bengal depended on many reasons” Elaborate. (10)  
(c) Write short note on: i) Samatata ii) Vangya iii) Pundravarddhan (15)

**Section – B**

- 5 (a) Write down the differences between urban and rural settlement. (10)  
(b) Discuss the types of settlement based on their functions with relevant diagram. (15)  
(c) What are the principles of human settlement? (10)
- 6 (a) Write down the differences between Forum and Colosseum. (10)  
(b) What type of settlement layout exists in Rome? Mention the features of city planning in Roman period. (10)  
(c) The residences in Ancient Greek civilization were planned with modern urban planning concepts. To what extent do you agree or disagree with this statement? Provide justification for your opinion. (15)
- 7 (a) Compare the site factors contributed to build and grow the Mesopotamia and Egyptian civilization. (18)  
(b) Mention the remarkable features of “City of Kahun”. (07)  
(c) Discuss the city planning concepts of Mesopotamia civilization. (10)
- 8 (a) Why did ingenuity and innovations of Ancient Greece come from Athens? (15)  
Mention some Building Regulations practiced by Greek Civilization.  
(b) Describe the construction technology of Roman civilization still used today. (10)  
(c) Discuss the city planning concepts of Mohenjo- Daro. (10)