

Khulna University of Engineering & Technology
Department of Urban and Regional Planning
BURP 1st Year 2nd Term Regular Examination, 2021
Math 1217
(Mathematics-II)

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) Define limit of a function. A function $f(x)$ is defined as follows: (10)
- $$f(x) = x^2 + 4; \text{ for } x < 3$$
- $$= 5; \text{ for } x = 3$$
- $$= x + 10; \text{ for } x > 3$$
- Determine the value of $\lim_{x \rightarrow 3} f(x)$
- (b) Discuss the continuity at $x = 1$ and differentiability at $x = 2$ of $f(x)$. Where (14)
- $$f(x) = 5x - 4; \text{ when } 0 < x \leq 1$$
- $$= 4x^2 - 3x; \text{ when } 1 < x < 2$$
- $$= 3x + 4; \text{ when } x \geq 2$$
- (c) Find $\frac{dy}{dx}$, where $y = x^{\sin^{-1}x} + (\cos x)^{\log x}$ (11)
2. (a) Find the n th derivative of $y = \frac{x}{x^2 - 5x + 6} + \sin 4x$ (11)
- (b) If $y = (\cos^{-1} x)^2$, then find y_{n+2} by using Leibnitz's theorem. (10)
- (c) Discuss the maxima and minima of $x^3 - 9x^2 + 24x - 12$ (14)
3. (a) Solve $\frac{d^2y}{dx^2} + y = \sin 2x \sin x$ (10)
- (b) Solve $\frac{d^2y}{dx^2} - 2 \frac{dy}{dx} + y = xe^x \sin x$ (12)
- (c) Find the general solution of (13)
- $$\frac{d^4y}{dx^4} + 2 \frac{d^3y}{dx^3} - 3 \frac{d^2y}{dx^2} = x^2 + 3e^{2x} + 4 \sin x$$
4. (a) Determine the particular solution of (10)
- $$\frac{d^2y}{dx^2} - 4 \frac{dy}{dx} + 29y = 0; y(0) = 0, y'(0) = 5$$
- (b) Solve $\frac{d^2y}{dx^2} + y = \tan x$ (13)
- (c) Find the general solution of $\frac{d^2y}{dx^2} - 6 \frac{dy}{dx} + 9y = x^2 + x + 2$ (12)



Section – B

5. (a) Calculate $\int \frac{dx}{(1+x)\sqrt{1+2x-x^2}}$ (12)
- (b) Evaluate $\int \sqrt{\frac{a+x}{a-x}} dx$ (11)
- (c) Calculate $\int (4x + 15)\sqrt{x^2 + 6x + 10} dx$ (12)
6. (a) Evaluate $\int_{\alpha}^{\beta} \frac{dx}{\sqrt{(x-\alpha)(\beta-x)}}$ (12)
- (b) Evaluate $\int_0^{\pi/2} \frac{dx}{4+5 \sin x}$ (11)
- (c) Evaluate $\int_0^{\pi} x \log \sin x dx$ (12)
7. (a) Find the area of the segment cut off from $y^2 = 4x$ by the line $y = x$ (13)
- (b) Solve the initial value problem (10)
- $$x \sin y dx + (x^2 + 1) \cos y dy = 0 ; y(1) = \frac{\pi}{2}$$
- (c) Solve the equation (12)
- $$(x - y - 1)dx + (4y + x - 1)dy = 0$$
8. (a) Solve $(2x \cos y + 3x^2y)dx + (x^3 - x^2 \sin y - y)dy = 0$ & $y(0) = 2$ (12)
- (b) Solve $(x^2y^3 + 2y)dx + x(2 - 2x^2y^2)dy = 0$ (12)
- (c) Solve $(1 + x^2) \frac{dy}{dx} + 2xy = 4x^2$ (11)

Khulna University of Engineering & Technology
Department of Urban and Regional Planning
BURP 1st Year 2nd Term Examination, 2021.
URP 1211
(Urban Planning Principles)

Full Marks: 210

Time: 3.0hrs

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

Section – A

1. (a) "Successful town planning can be ensured by following the principles of town planning" – Justify this statement. (15)
(b) Briefly explain the role of new town in maintaining regional balance. (10)
(c) "Urban planning is inevitably a highly political activity" - Justify this statement with examples. (10)
2. (a) Suppose, you are an urban planner working for a bus terminal development project in Khulna City. Write down the things that you are going to consider for developing a new bus terminal in Khulna City. (15)
(b) Explain open space for active and passive recreation. What are the functions of open space? (10)
(c) A real estate company is planning to build a three-story building on a rectangular plot that has 200 feet of street frontage and 300 feet of depth. The first, second and third story measures 100 feet by 200 feet. Calculate the FAR of the building. (10)
3. (a) Briefly discuss the suburban neighbourhood unit concept and specify how suburban neighbourhood unit can increase environmental pollution. (15)
(b) "Very high or very low population density is not good for community development" – Justify the statement with necessary examples. (10)
(c) Write short notes on the following types of recreational area. (10)
 - (i) Boulevards or parkways
 - (ii) National parks
4. (a) "Landmark design of a railway station can deliver a strong sense of place and a quality passenger experience." – make a short discussion about this statement in accordance with the principles of good railway design. (20)
(b) Briefly discuss the factors that you are going to consider for choosing the best location for a seaport. (05)
(c) "Open spaces are the link between man and nature" – Explain the statement with necessary examples. (10)

Section – B

5. (a) "Urban planning is a process (or activity) concerned with making choices about future options to achieve certain goals and objectives (of the society) related to development" – explain this statement with example. (10)
(b) Describe various functional part of urban area with necessary example. (15)
(c) "Vehicular mobility gradually increases and land access decreases from local roads to freeways" – explain using necessary diagram. (10)



6. Nighttime light data has been widely used to detect urban areas. We can estimate approximate area and population of urban areas using Nighttime light data.
- (a) From nighttime light data, how can we separate urban and rural areas? (05)
 - (b) Describe the applicability of Primate City law from approximate population data of cities in Bangladesh. (15)
 - (c) Rank size rule cannot be applied in Bangladesh. Describe this statement from population data of cities in Bangladesh. (15)
7. In order to make Dhaka livable, initiative must be taken to reduce the pressure of people on Dhaka. The Government has already taken steps to decentralize Dhaka's industrial sectors and transform Dhaka into a fully residential city. A well-planned industrial zone allows firms/industries to obtain benefit from locating near each other.
- (a) Define industrial agglomeration with an example. (05)
 - (b) Mention the advantages and drawbacks of firms/industries having a close proximity to one another. (15)
 - (c) Describe different types of industrial linkage with necessary diagrams. (15)
8. It is anticipated that by 2030, 60% of our total population of different urban areas will be comprised of children (UNFPA). As Bangladesh makes social and economic progress, we notice a variegated development spree in many urban areas and in big cities. But these development works should be planned keeping the priority of the children in mind. Answer the following questions based on the aforementioned statement.
- (a) What issues do children face in cities as a result of improper planning? (10)
 - (b) What are the components of child friendly city? (10)
 - (c) Development works should be planned keeping the priority of the children in mind. Write down some suggestions for child-friendly city development as an urban planner. (15)
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Khulna University of Engineering & Technology
Department of Urban & Regional Planning
BURP 1st Year 2nd Term Examination, 2021
Hum 1217
(Principles of Economics)

Full Marks: 210

Time: 3.0 hrs

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

Section – A

1. The values in the following table refer to the change in an individual's consumption of lemon and tea at home when the price of lemons rises (everything else, including the price of tea, remains the same). (35)

Commodity	Before		After	
	Price (cents/unit)	Quantity (units/month)	Price (cents/cup)	Quantity (units/month)
Lemons	10	20	20	15
Tea	20	40	20	35

- (i) Define law of demand.
(ii) Distinguish between shift in demand and movement along the demand curve.
(iii) Draw the figures showing these changes.
(iv) Explain the figure drawn.
2. (a) From the specific supply equation $Q_s = 20 + P_x$ (P_x is given in dollars), derive (20)
(i) The producer's supply schedule and supply curve.
(ii) What things have been kept constant in the given supply function?
What is the minimum price that this producer must be offered in order to induce him or her to start supplying commodity X to the market?
- (b) Suppose the demand function is $Q_d = 50 - P$; and the supply function is $Q_s = 20 + 2P$. (15)
Find equilibrium price P and quantity Q.
If the government imposes \$3 tax on per unit sold of X, what effect does this have on equilibrium price and quantity?
3. (a) What is production? Discuss the different factors of production. (15)
(b) What is law of variable proportion? Describe. (20)
4. (a) Define market. Distinguish between perfect competition and monopoly. (05)
(b) Define Perfect Competitive Market. Explain how does a competitive firm maximize its profit in short run. (20)
(c) What is the shut-down position of a firm under perfect competition? Explain with necessary figure. (10)

Section – B

5. (a) Write short notes on following: (15)
(i) Business cycle
(ii) The determination of interest rate
(iii) The functions of a commercial bank.
- (b) What is the meaning of Nominal GDP and Real GDP? Which of these is the indicator of economic welfare? (10)
- (c) What type of problems arises in calculating national income? How do the problems of double counting be avoided? (10)
6. (a) What is meant by profit? Explain the various types of profit. (15)
- (b) Define unemployment. What are the economic & non-economic costs of unemployment? Elaborate. (20)
7. (a) What are the main causes of inflation in a country like Bangladesh? (15)
- (b) As a policy maker, in how many ways will you be able to control inflation? Illustrate. (20)
8. (a) What are the factors affecting investment? Describe. (15)
- (b) SK Corporation is considering two projects A and B respectively. The initial investment is Tk 10,000. The cost of capital is 10% for each project. The return of the projects are as follows: (20)

Year	Project-A	Project-B
1 st Year	5,000	3,500
2 nd Year	4,000	3,500
3 rd Year	3,000	3,500
4 th Year	1,000	3,500

Which project should SK Corporation invest in? Comment using the NPV method.

Khulna University of Engineering & Technology
Department of Urban and Regional Planning
BURP 1st Year 2nd Term Examination, 2021
URP 1281
(Surveying and Cartography)

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.

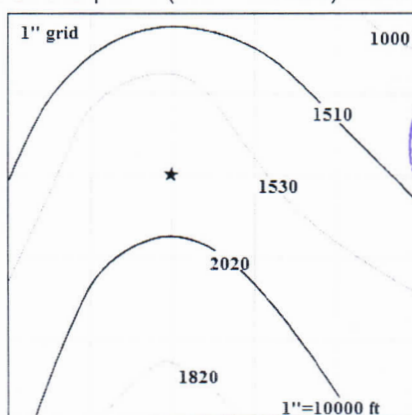
Section – A

1. (a) Define the following with necessary sketch and example: (10)
 - i) Large-scale and small-scale maps
 - ii) Well-conditioned and ill-conditioned triangles
 - iii) Reconnaissance survey and index sketch
- (b) What is offset? Mention some guidelines for number of offsets taken in the field for different object nature. (10)
- (c) The length of the offset is 15 m and the scale of the plan: 10 m to 1 cm. If the offset is laid out 3° from the true direction, find the displacement of the plotted point on the paper (15)
 - i) Perpendicular to the chain line
 - ii) Parallel the chain line.
2. (a) Define the following with necessary sketch and example: (10)
 - i) True meridian and magnetic meridian
 - ii) Whole circle bearing and reduced bearing
- (b) Discuss the methods of plane table surveying. (10)
- (c) The whole circle bearing s (WCBs) of a following chain are obtained by a prismatic compass: (15)

Line	WCB
AB	50°
BC	130°
CD	200°
DA	310°

Calculate the interior angle.

3. (a) Differentiate between simple leveling and fly leveling. (05)
- (b) Determine the elevation of the point (star marked) from the following figure. (10)



- (c) The following consecutive readings were taken with a level and a 4-meter leveling staff on a continuously sloping ground at common intervals of 50 m: 0.855 m (on A), 1.545 m, 2.335 m, 3.115 m, 3.825 m, 0.045 m, 1.380 m, 2.055 m, 3.455 m, 0.585 m, 1.015 m, 1.850 m, 2.755 m and 3.845 m (on B). The RL of A was 105.500 m. Make entries in a level book and applies the usual checks. The change points were taken at 150 m and 400 m in chainage. (20)

4. (a) What is contour line? Explain the characteristics of contours with necessary sketches. (15)
- (b) The following perpendicular offsets were taken from chain line to an irregular boundary at 10 m interval: 3.10, 4.20, 5.35, 6.45, 7.15, 8.25, 7.95 and 5.20 m. Calculate the area between chain line, the boundary and the end offsets by trapezoidal rule. (10)
- (c) What are the advantages and disadvantages of total station? Explain with examples. (10)

Section – B

5. (a) What do you mean by map in cartography? Describe the basis of cartography. (15)
- (b) Describe the different types of map with examples. (20)
6. (a) Discuss various types of map scales with necessary examples. (15)
- (b) Describe some general principles of making better maps. (20)
7. (a) Which factors do you consider for map designing and layouting? (15)
- (b) Describe the Lambert Conformal Conic Projection with its properties. (10)
- (c) Describe the Universal Transverse Mercator (UTM) Coordinate System. (10)
8. Annotate the following terms (any five): (35)
- i) Spatial Reference
 - ii) Latitude
 - iii) Longitude
 - iv) False Easting
 - v) False Northing
 - vi) Geoid
 - vii) Spheroid or Ellipsoid
 - viii) Datum

Khulna University of Engineering & Technology
Department of Urban and Regional Planning
BURP 1st Year 2nd Term Examination, 2021
URP 1251
(Introduction to Architectural History)

Full Marks: 210

Time: 3.0 hrs

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

Section – A

1. (a) Difference between Architecture and Planning depends on the scale of thinking and working- Explain. (10)
(b) How has Bengal's vernacular settlement influenced modern building design? Explain with sketches. (15)
(c) Globalization poses a threat of homogenization and the loss of the uniqueness of architecture- Explain. (10)
2. (a) Describe the architectural characters of Khan-e-Jahan style with necessary sketches. (10)
(b) Write down about the origin and features of Bungalow. (15)
(c) Describe the principles of sustainable architecture. (10)
3. (a) Write down the elements of Hindu temple with necessary sketches. (10)
(b) Describe the architectural features of Kantaji temple with necessary sketches. (15)
(c) Write short note about Curzon Hall with sketches. (10)
4. (a) Write down the architectural features of Mughal style with sketches. (10)
(b) Write short notes on Buddhist Stupa. (10)
(c) Why is Mazharul Islam regarded as the grand master of regional modernism in South Asia? Identify the contributions of Mazharul Islam. (15)

Section – B

5. (a) Architecture is an art- Elucidate this statement. (10)
(b) Explain the architectural features of Minoan civilization with necessary diagrams. (15)
(c) Write about the art works of Minoan civilization with necessary diagrams. (10)
6. (a) Write about the influences of world architecture in Bengal architecture. (10)
(b) Describe the architectural features of Gothic Architectures with sketches. (15)
(c) Write about the statement of- "Form, Light and Shadow and Dramatic Intensity" of Baroque Architecture. (10)
7. (a) Write down the Renaissance architectural features with illustrations. (15)
(b) Write down the architectural order of Greek Civilization with sketches. (15)
(c) Write a short note on 'Optical Correction' in architecture. (05)
8. (a) Explain the features of Modern & Contemporary Architecture with necessary diagrams. (15)
(b) Write short notes (any four): (20)
i. Green Architecture, ii. LEED, iii. SEED, iv. The New York Five, v. High-Tech Architecture, vi. Classical Column

