SECTION – A

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

1. (a) How do different types of constraints affect planning process? Discuss with examples. (13 3/4)
   (b) How does spatial planning ensure economic efficiency and functionality? Discuss with examples. (10)

2. (a) The contents of level wise plan are the sectoral plans. Explain the statement with relevant examples. (15 3/4)
   (b) Name the rivers surrounding Dhaka city mentioned in 1959 master plan. (8)

3. (a) Suppose you are a member of a planning firm and is involved in preparing structure plan for an urban area of Bangladesh. What issues will you be concerned with at the very beginning of the plan making process? Explain. (18)
   (b) Briefly discuss about ‘Sustainable Development Goals (SDGs)’.

4. Write short notes on the following:
   (a) Patrick Geddes and plan for Dacca, (8)
   (b) National Economic Council (NEC), (5)
   (c) Limitations of systems approach in planning, (5)
   (d) Rigidity of traditional planning approach. (5 3/4)

SECTION – B

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

5. (a) “All planning involves a sequential process which can be conceptualized into a number of steps”. What are these steps? Explain. (23 3/4)

6. Discuss the essential nature of planning with reference to the following statements:
   (a) Planning is a continuous process, (5)
   (b) Planning is a mental exercise, (5)
   (c) Planning involves decision-making, (5)
   (d) Planning is an integrated process, (4 3/4)
   (e) Planning is forward looking. (4)
7. (a) Using a diagram show the major dimensions of plans. (5½)
   (b) What do you mean by standing plans? Give examples. (10)
   (c) What is strategic planning? How does it differ from tactical/operational planning? (8)

8. (a) What do you mean by people’s participation in planning process? (5)
   (b) Why participatory approach may be needed? (6½)
   (c) Discuss the functional approach of participation showing the functional roles of different actors in planning activities. (12)
SECTION – A

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

1. (a) What are the procedural differences between chain and traverse surveys? (5)

(b) Discuss about the general stages of surveying. (15)

(c) An automatic level is placed at C on a line AB, 3000 feet from A and 6000 feet from B. The difference between the staff reading at A and B is 8.50 feet. The staff reading at is 5.50 feet, and B is on a lower ground than A. By making required corrections to the staff readings, calculate the true difference of level between A and B. (15)

2. (a) In order to change locations for placing stations in chain and traverse surveys, some considerations need to be taken. What are these considerations? (10)

(b) Using an Engineer’s chain a distance AB is measured and found to be 10 m shorter than the actual value. A previous measured of the same distance AB with a Gunter’s chain provided a value of 2500 m. Find the actual length of AB and the Engineer’s chain if the Gunter’s chain was 3 inch short. (20)

(c) What is the use of a “change point” in levelling? (5)

3. (a) What do you understand by the term “Benchmark” in relation to levelling operation? State the different types of benchmarks and their uses. (2+8=10)

(b) Illustrate all the methods of plane tabling for locating objects on the drawing sheet. Provide necessary diagrams to explain your answer. (15)

(c) Under what circumstances a measurement taken by chain might lead to an inaccurate reading? Describe the different types of error encountered in chain surveying. (6+4=10)

4. (a) List the steps to conduct the mechanical method of resection used in plane table surveying. (15)

(b) The table below shows the recorded angles and lengths of a traverse survey ABCDEA conducted in an urban area.

<table>
<thead>
<tr>
<th>Station</th>
<th>AB</th>
<th>BC</th>
<th>CD</th>
<th>DE</th>
<th>EA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Bearing (WCB)</td>
<td>60°00'</td>
<td>150°30'</td>
<td>190°15'</td>
<td>280°30'</td>
<td>355°00'</td>
</tr>
<tr>
<td>Length (m)</td>
<td>20</td>
<td>30</td>
<td>30</td>
<td>25</td>
<td>35</td>
</tr>
</tbody>
</table>
(i) Does this traverse contain any closing error? If yes, specify the magnitude of this error. (15)

(ii) The precision of traverse survey in urban area should not exceed 1 in 10,000. Do you think this survey satisfies the minimum precision requirement? (5)

SECTION – B
There are FOUR questions in this Section. Answer any THREE.

Use any reasonable number/value if necessary

5. (a) Define cartography. Why urban planners need to learn cartography? Explain the issues that cartography covers. (3+3+4)

(b) Describe with example the spatial concepts that are considered secondary in cartometrics. (12)

(c) Explain the sources of error during a GPS operation. (10)

(d) You have to draw flight lines in 1:62,500 scale map. The length of flight line is 16 kilometer and spacing between two consecutive flights is 4025 meter. What would be the length of flight line and spacing between two consecutive flight line in the map? (3)

6. (a) “Through in GIS we produce maps-GIS is not cartography” – do you agree? Justify your answer. (1+12)

(b) Define datum, ellipsoid and geoid. Explain the relationship among them. (3+4)

(c) Explain the reasons used by the cartographers for generalizing maps. (10)

(d) In an aerial photograph, relief displacement of a tower is found 2.01 mm, radial distance of the top of the tower was 56.43 mm. If the flying height is 1220 m and average elevation of the site is 120 m, what is the height of the tower? (5)

7. (a) During a GPS survey, you observe the followings in the receiver HDOP5, VDOP4 and TDOP4. Would you use the data for geographical and positional determination? Justify your answer. (05)

(b) “Map projection distorts spatial properties” - explain the properties. (8)

(c) Describe the typology of cartogram. (10)

(d) You are in charge of preparing maps for your company. What are the things you would consider before preparing a map? (12)

8. (a) Explain the ways you can use ‘insets’ in you map. (12)

Contd ……… P/3
(b) Write short notes on (Any three)-
   (i) Basic elements of map composition,
   (ii) General Purpose Maps of Bangladesh,
   (iii) Control segments of GPS system,
   (iv) Types of aerial photograph.

(c) You found that in the area you are working, ‘x-slope’ is 4 m/km and ‘y-slope’ is – 3 m/km. What would be the gradient of the area?
L-1/T-2/URP

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA
L-1/T-2 BURP Examinations 214-2015

Sub: ARCH 145 (Elements of Architecture)

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: (any Five):

(i) Primary solids; (ii) Collision of form; (iii) Path-Space Relationship;
(iv) Proportion and Scale; (v) Axis and Hierarchy; (vi) Unity in Variety.

(5×6=30)

2. How can horizontal and vertical elements define a space? Explain with sketches.

(20)

3. (a) What are the key factors of selecting any spatial organization?
(b) Elaborate with sketches of different “Spatial organizations”.

(4) (16)

4. Briefly explain the form of the National Assembly building of Bangladesh, focusing on “Transformation of form” of the built volume and “Organization” of its elements. Explain with sketches.

(20)

SECTION – B

There are FOUR questions in this Section. Answer Q. No. 5. and any TWO from the rest.

5. Write short notes: (any five)

(i) Main features of stupa; (ii) Evolution of pyramid; (iii) The pantheon
(iv) Evolution of early settlement; (v) City planning, Greek;
(vi) Influencing factors in Architecture

(5×6=30)

6. (a) Define ‘Architecture as a system’.
(b) What is the role of an Architect?
(c) How do you define Urban Planning and Urban Design?

(12) (4) (4)


(3+17=20)

8. Briefly explain the main features of building design strategy in the context of old Dhaka in terms of:

(i) Settlement Planning, (ii) Urban form and External space, (iii) Air flow, opening and ventilation, (iv) Shape and volume.

(4×5=20)

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SECTION – A

1. (a) Distinguish between the concepts of savings and investment. Discuss how J.M. Keynes has proved the equality between savings and investment. (7)
(b) Explain the concepts of Gross National Product (GNP), Gross Domestic Product (GDP) and Net National Product (NNP). What is the distinction between GNP and GDP? (6)
(c) What are the difficulties in the measurement of national income of a country? Briefly discuss them. (7)
(d) Calculate the national income from the following information:
   GNP = Tk. 1,17,000 crore
   Depreciation = Tk. 10,000 crore
   Indirect tax = Tk. 12,000 crore
   Subsidy is 20% of indirect tax. (15)

2. (a) What does aggregate demand curve look like? Explain the shape of aggregate supply curve. (10)
(b) What are the factors that affect the changes of aggregate demand and aggregate supply? (10)
(c) Explain the macroeconomic equilibrium with the help of aggregate demand and aggregate supply. (10)
(d) Why is demand pull inflation better than cost push inflation? (5)

3. (a) Explain the concept of inflation. Briefly discuss the various polices for controlling the prevailing inflation in our country. (10)
(b) Discuss the Harrod-Domar growth model of economic development. (15)
(c) Briefly explain the operation of four wheels of growth in the least developed countries. (10)

4. (a) Explain the credit creation process of a commercial bank. What are the limitations to the credit creation power of a commercial bank? (20)
(b) What are the functions of a central bank? Explain them. (15)
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SECTION – B

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

5. (a) Define unemployment and unemployment rate. (5)

(b) Explain different types of unemployment the exists in a developing country like Bangladesh. (10)

(c) What do you understand by equilibrium unemployment and disequilibrium unemployment? What are the causes of disequilibrium unemployment? (20)

6. (a) What do you understand by investment multiplier? Describe the working of the investment multiplier. (10)

(b) Explain the leakages of multiplier. (10)

(c) How is income determined in an open economy? (15)

7. (a) In a two country two commodity model, show that both the countries will be benefited after trade. (20)

(b) Critically examine Fisher’s Equation of Exchange. (15)

8. (a) What is the equation that describes the IS curve? (10)

(b) How would you derive the IS curve from the aggregate demand curve? Explain graphically. (10)

(c) What are the factors that determine the slope of the IS curve? (5)

(d) Explain the role of autonomous spending in shifting of the IS curve? (10)
SECTION – A

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

1. (a) Test the continuity and differentiability of the function
\[ f(x) = |x| + |x - 1| \] at the points \( x = 0 \) and \( x = 1 \).

(b) Find the n-th derivative of \( y = \tan^{-1} \frac{1 + x^2 - 1}{x} \).

2. (a) If \( y = \sin(a \sin^{-1} x) \), then show that \( (1 - x^2) y_{n+2} - (2n+1)y_{n+1} - (n^2 - a^2) y_n = 0 \).

(b) Find the dimensions of the largest rectangle which can be inscribed in the ellipse \( \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \).

3. Workout the following:

(a) \( \int \frac{dx}{4 \sin x + 5 \cos x} \)  
(b) \( \int \frac{x^2}{x^4 + a^4} \, dx \)  
(c) \( \int \cos^{-1} \frac{1-x^2}{1+x^2} \, dx \)

4. (a) Evaluate: \( \lim_{n \to \infty} \left[ \left( 1 + \frac{1}{n} \right) \left( 1 + \frac{2}{n} \right) \ldots \left( 1 + \frac{n}{n} \right) \right]^{1/n} \)

(b) Find the area enclosed by the curves \( y = x^2, \ y = 2x \) and \( y = 2 \).

SECTION – B

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

5. (a) Find the differential equation corresponding to the family of curves, 
\( xy = ae^x + be^{-x} + x^2 \), where \( a \) and \( b \) are arbitrary constants.

(b) Solve: \( \frac{dy}{dx} = \frac{x + y + 1}{2x + 2y + 1} \)

(c) Solve: \( (x^2 - xy + y^2) \, dx - xydy = 0 \)
6. Solve:
   
   (a) \( \left(1+e^{\frac{y}{x}}\right)dx+e^{\frac{y}{x}}\left(1-\frac{x}{y}\right)dy=0 \)  
   \( (7) \)
   
   (b) \( \frac{dy}{dx}+y=xy^3 \)  
   \( (8 \frac{1}{3}) \)
   
   (c) \( (1+x^2)\frac{dy}{dx}+y=tan^{-1}x \)  
   \( (8) \)

7. Solve the following differential equation:
   
   (a) \( \frac{d^4y}{dx^4}-\frac{d^3y}{dx^3}-\frac{d^2y}{dx^2}+\frac{dy}{dx}+2y=0 \)  
   \( (7) \)
   
   (b) \( \frac{d^3y}{dx^3}-\frac{d^2y}{dx^2}+4\frac{dy}{dx}-4y=68e^{x}sin2x \)  
   \( (8 \frac{1}{3}) \)
   
   (c) \( \frac{d^2y}{dx^2}+2\frac{dy}{dx}-7y=x^3+2x+7 \)  
   \( (8) \)

8. (a) The rate at which radioactive nuclei decay is proportional to the number of such nuclei that are present in a given sample. Half of the original number of radioactive nuclei have undergone disintegration in a period of 1500 years. What percentage of the original radioactive nuclei will remain after 4500 years?  
   \( (11) \)
   
   (b) Solve: \( x^3 \frac{d^3y}{dx^3}-4x^2 \frac{d^2y}{dx^2}+8x \frac{dy}{dx}-8y=4lnx \)  
   \( (12 \frac{1}{3}) \)