L-3/T-1/URP **Date : 28/06/2015**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-1 BURP Examinations 2013-2014

Sub : **PLAN 343** (Traffic and Transportation Study)

Full Marks : 210 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**.

The abbreviations have their usual meaning.

1. (a) Show a comparison of traffic volume counted at control points (actual count) with the volume/number of vehicles passing those points as determined from the interviews for both internal and external traffic. **(7)**

   (b) What do you mean by 'traffic delay'? Discuss with examples. **(6)**

   (c) What is AADT? Which 'level of measurement of flow is most suitable for analyzing the trend of traffic flow and why? **(3+5=8)**

   (d) Define 'Desire line graph'. Is it possible to collect through traffic data from 'Home Interview Survey'? Justify your answer. **(4+5=9)**

   (e) The regional planning agency has adopted persons per vehicle as a performance measure that can be used to measure the level of success of regional policies. These policies are designed to increase vehicle occupancy so that traffic congestion will be reduced. Based on numerous data collection techniques, outline a data collection strategy that would provide input into this performance measure. **(5)**

2. (a) Name the most efficient technique/method devised by Road Research Laboratory to calculate travel demand and determine speed-flow relationship along a transportation network. List out the vehicle and journey related information needed under a 'Commercial Vehicle Survey'. **(2+5=7)**

   (b) Describe the 'Enoscope method' of spot speed study with necessary illustration. **(7)**

   (c) With reference to 'Tri-State New York Metropolitan Transportation Study' state the process of selecting most suitable cordon line. **(6)**

   (d) For performance assessment of the major intersections in Dhaka city a case study of 21 major intersections along Pallabi to Mothijheel route (13.41 km) was undertaken. Speed data was needed to be calculated for this purpose along both directions (northbound and southbound) using Moving Observer Method. **(15)**

Table 01

Journey Direction		Journey Time (minute)	Stopped Time (minute)	Vehicles met with in the opposing direction (PCU)	Vehicles in the same direction	
					Overtaking vehicles	Overtaken vehicles
North bound	Run No. 1	99.92	47.91	5104.65	2018	1264
	Run No. 2	103.29	51.386	5295.55	1886	1164
South bound	Run No. 1	117.90	61.12	4535.47	2196.33	1144.67
	Run No. 2	121.12	60.443	4815.65	2227	1124

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Contd ... Q. No. 2(d)

Using Table 01, Calculate the following for 'Northbound' direction of flow:

(i) Traffic flow of the stream (PCU/min)

(ii) Mean journey speed (KPH)

(iii) Mean running speed (KPH)

3. (a) Assume that the following goals have been established for a transportation planning study. **(10)**

Goal 01: The transportation system should provide mobility for all segments of the population.

Goal 02: The transportation system should minimize impact on the natural environment.

Define at least three objectives for each goal that could be used to achieve the stated purpose. For Each objective, define a measure of effectiveness that could be used to measure the degree to which the objective is achieved.

(b) What kind of data for on-street and off-street spaces are needed to be collected for parking space inventory? **(5)**

(c) "On-street parking should be prohibited at certain locations" – which locations are those? Briefly discuss. **(10)**

(d) A study on parking management inside BUET campus was conducted to evaluate and analyze the current parking supply and demand scenario of BUET. For this purpose both Parking Space Inventory and Parking Usage Survey by patrol have been carried out. Survey was done for 4 hours of a weekday at three time frames including 7.30 AM to 9.00 AM, 1.00 PM to 2.00 PM and 3.30 PM to 5.00 PM at the interval of 15 minutes. From the parking inventory survey, total parking volume is found as 480 over a time period of 4 hours. Number of space available for parking provision (summation of designated and undesignated parking spaces) is 213 at a time. **(10)**

Collected data from Patrol survey is given in Table 02:

Table 02

Duration (Hours)	Number of vehicles
0.25	125
0.5	78
0.75	44
1	48
1.25	12
1.5	26
1.75	8
2	8
2.25	9
2.5	7
2.75	5
3	6
3.25	2
3.5	2
3.75	1
4	7

Calculate –

(i) Average Parking Duration (in hour)

(ii) Parking Turnover (in a period of 4 hours)

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4. (a) how can driver judgement and physical characteristics of road play major role behind accidents? **(8)**

(b) Draw Pedestrian Signal Indication and Signal face. Also draw a typical layout of traffic signal installations. **(4+5=9)**

(c) Differentiate between Fixed-Time Signals and Vehicle-Actuated Signals. **(6)**

(d) Identify each of the following Traffic Signs/Road Markings (Fig. a-h) according to typology and draw a difference among their functional role in controlling and guiding traffic. **(12)**

Fig.(a)

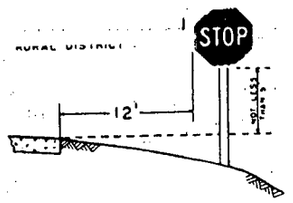
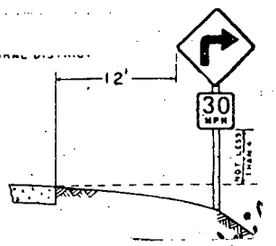


Fig. (b)



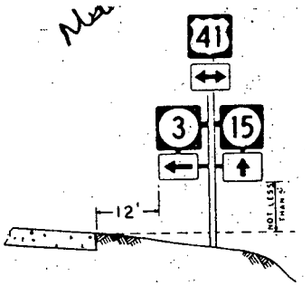


Fig. (c)

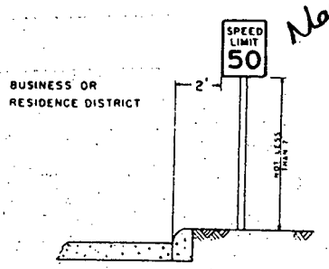


Fig. (d)

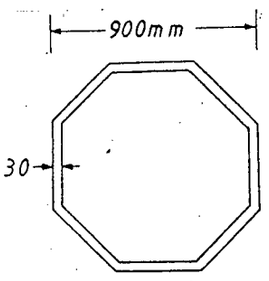
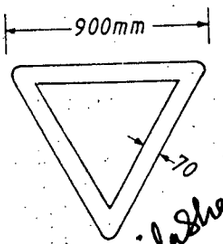


Fig. (e)



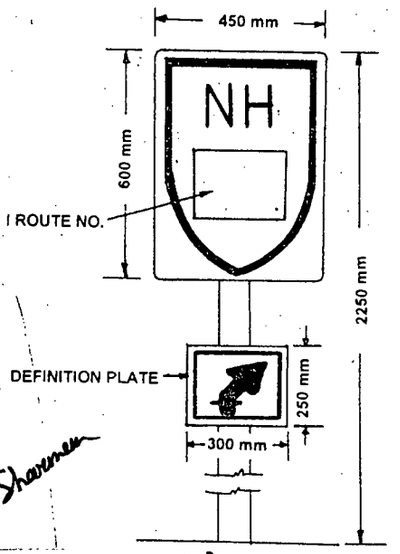


Fig. (f)

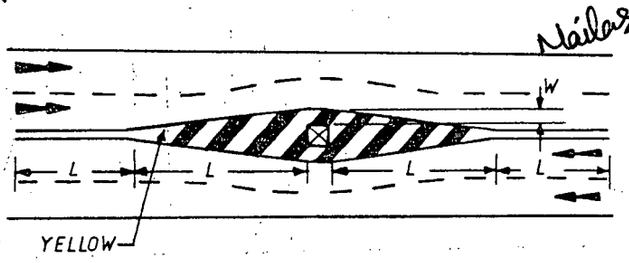


Fig. (g)

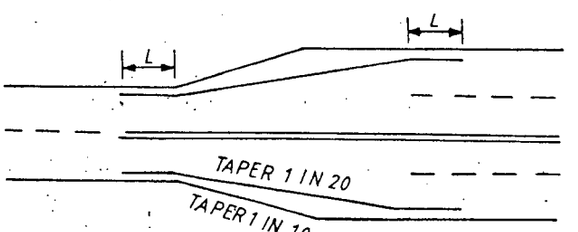


Fig. (h)

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SECTION – B

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

5. (a) Define transportation system with a brief description of its sub-systems. **(15)**

   (b) Define 'Para-transit' system. **(5)**

   (c) Write down the advantages of 'Rotary' and 'Clover leaf' interchanges with supporting schematic diagrams. **($7\frac{1}{2}+7\frac{1}{2}=15$)**

6. (a) Distinguish between 'Urban Form' and 'Urban Spatial Structure'. **(8)**

   (b) Briefly describe the interactions among transportation, activity systems and land use. **(17)**

   (c) Briefly describe the changes in street pattern with special reference to pre-industrial and post-industrial period. **(10)**

7. (a) Define 'Headway' with example. **(5)**

   (b) Why are capacity studies important in transportation planning? **(10)**

   (c) Write down a comparative description of any four travel demand management strategies. **(20)**

8. Write short notes on the following (any five) **(5×7=35)**

   (a) PCU

   (b) Design Capacity vs. Possible Capacity

   (c) Efficiency criteria of transport modes

   (d) Level of Service

   (e) Purpose of Channelized Intersection

   (f) Basic principles of designing intersections.

L-3/T-1/URP Date : 05/07/2015

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-1 BURP Examinations 2013-2014

Sub : **PLAN 321** (Housing and Real Estate Development)

Full Marks : 210 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. (a) With the help of filtering model of housing, explain how a dwelling unit moves down the quality ladder to households with progressively lower income. Provide graphical representation if needed. **(12)**

   (b) What are the impacts of subsidization and growth control policies on filtering process of housing? **(6)**

   (c) Explain real estate trade cycle with the help of Simple stock flow model. **(13)**

   (d) How does myopic expectation of the investors affect the demand in real estate market? **(4)**

2. (a) "Choice of housing location is not always determined by the trade off between housing consumption and commuting cost, but it depends on other factors". Explain the statement in light of income segregation theory of housing. **(12)**

   (b) What do you mean by implicit price of housing attributes? How can you determine the implicit price of a particular housing attribute by Hedonic approach? **(2+8=10)**

   (c) Write short notes on the following considering Hedonic Pricing model of housing (Use graphical representation if needed). **(3+3+3=9)**

   (i) Utility Function (ii) Bid function

   (iii) Optimal choice of housing attribute.

   (d) What do you mean by property title? What are the methods of title assurance? **(1+3=4)**

3. (a) Derive the equation of rent gradient for housing in a stylized monocentric city according to "Recardian Rent Theory". Show the major components of housing rent with proper graphical representation. **(11)**

   (b) In a monocentric city urban density averages around 5 units of house per acre. Annual agricultural rent from farming is BDT 60,000 per acre per year (1 square mile = 640 acre). Structure cost of a dwelling is BDT 20,00,000. Cost of commuting for an average household is 2000 Tk/mile/year. Calculate the monthly rent of housing at the city center and at the edge of city. Distance to the edge of city is 20 miles from center. Assume an interest rate of 8% per year. After 10 years what will be the rate of increase of monthly rent at city center and at edge (20 miles from the center). Assume the city border is expanding by 4% each year. **(12+6=18)**

   (c) What are the sources of market inefficiencies in real estate market? How the extent of market disequilibrium can be assessed through a simplistic measure? **(3+3=6)**

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4. (a) Assume a city which initially had no building permit. Equilibrium quantity of housing supply per year was 140 unit with price \$70,000 per unit. Suppose, the city now limits the number of building permit to 80/year. The permit policy increases the price by \$ 20,000 and the production cost drops to \$ 60,000. Show the market effect of building permit with graphical representation. Calculate the monetary value of the permit for each house. **(5+5=10)**

(b) The following figure shows the effect of housing voucher program on recipient's budget decision and utility. Suppose, the Government has undertaken a public housing program. A typical dwelling in public housing generates 540 units of housing service while the government has to subsidize \$ 300 for each dwelling. Providing housing voucher with face value equal to \$ 300 can be another alternative. Which one do you think should be better from recipient's perspective? Give proper explanation. **(15)**

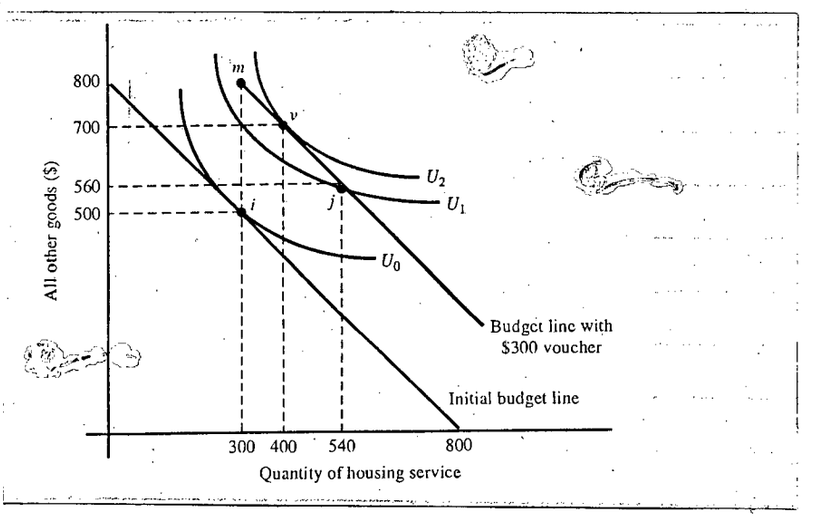

Fig. for Q. No. 4 (b)

(c) What are the impacts of rent control on housing market? Explain with graphical representation. **(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 the following (any five) **(5×7=35)**

(a) Housing Audit and Audit Methodology,
(b) Assessing Housing Need and Demand,
(c) Squatter settlement and city development,
(d) Housing Policy in Bangladesh,
(e) Housing Rehabilitation Projects in Bangladesh,
(f) House Building Finance Corporation – strategies for capacity building and capital formation,
(g) Green Infrastructure and Housing.

Contd P/3

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6. "Housing is the chance of a life-time" – Discuss this concept in the context of effect of good or bad housing on children's development, and their later development and performance in adulthood. Can you draw a comparison with housing in our country, specifically with that of informal settlements? **(35)**

7. Discuss the links between Economic Development, Poverty Alleviation and Housing Finance. Discuss the role of Grameen Bank in Housing Development in the rural areas of Bangladesh or elsewhere, with specific reference to Economic Development and Poverty Alleviation. **(35)**

8. Discuss the structure of cities and their residential locations with Urban Dynamic Growth Models. Can these models accurately explain residential locations in our cities, state reasons? Are there any theories that can better explain residential locations in our cities? **(35)**

L-3/T-1/URP **Date : 30/07/2015**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-1 BURP Examinations 2013-2014

Sub : **CE 361** (Elements of Solid Mechanics)

Full Marks : 210 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. (a) Define Centroid of Gravity (CG). How can you determine Centroid of a non uniform structural member section? **(5)**

   (b) In "Figure 1", a triangular hollow section is shown. Determine Centroid of Gravity of this section. **(30)**

2. (a) Define structural determinacy. Write a short note on equations of equilibrium. **(7)**

   (b) AB is a beam shown in "Figure 2". Determine if the beam is structurally determinate or not. If determinate, draw shear force diagram and bending moment diagram of this beam. **(28)**

3. (a) What do you mean by "Moment of Inertia of Area"? **(5)**

   (b) There is a section Q in "Figure 3". Determine Moment of Inertia of Area of this section Q about its centroidal axes. **(30)**

4. (a) Define shear force and bending moment. **(7)**

   (b) ABC is an overhanging beam shown in "Figure 4". Draw shear force diagram and bending moment diagram of this beam for the given loading condition. **(28)**

SECTION – B

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

5. (a) What is parallel force system? A parallel force system is shown in Figure 5. Determine the value of resultant force and its distance from point A. **(10)**

   (b) Two rectangular bodies P in AB plane and Q in BC plane are shown in Figure 6. Weight of body P is 45 kip and body Q is 35 kip. The forces acting on this body are shown in the figure. Determine the cable tension and surface reaction of AB plane. Also determine the angle ACB. **(25)**

Contd P/2

CE 361/URP

6. (a) What is the difference between non-coplanar concurrent force and coplanar non-current force system? Explain with figures. **(7)**

   (b) There are four spheres A, B, C and D shown in Figure 7. Weight of sphere A is 15 kip, sphere B is 18 kip, C is 8 kip and D is 8 kip. Determine of sphere A is 3 feet, B is 3 feet and 3 inch, C is 2 feet and D is 3 feet. Determine the surface reactions on sphere D from both vertical and horizontal surfaces. **(28)**

7. (a) Define modulus of elasticity, modulus of resilience and modulus of rupture. **(6)**

   (b) Draw a qualitative stress strain diagram of an elastic material showing upper yield stress, lower yield stress, ultimate stress and breaking stress. **(8)**

   (c) What is the difference between ductile and brittle materials? Give examples of these materials. **(6)**

   (d) A circular rod with diameter of 20 mm and length 500 mm is subjected to a tensile force of 45 kN. Modulus of elasticity of the material is 200 kN/m^2. Find stress, strain and elongation of the bar due to applied load. **(15)**

8. (a) What is thermal strain? Explain with figure. **(5)**

   (b) A circular bar has a diameter of 10 mm. The length of the bar is 100 mm. Coefficient of thermal expansion is 0.00065 per degree Celsius. If the temperature increases by 2° C, determine the length change. **(15)**

   (c) Draw shear force and bending moment diagram of the beam shown in Figure 8. **(15)**

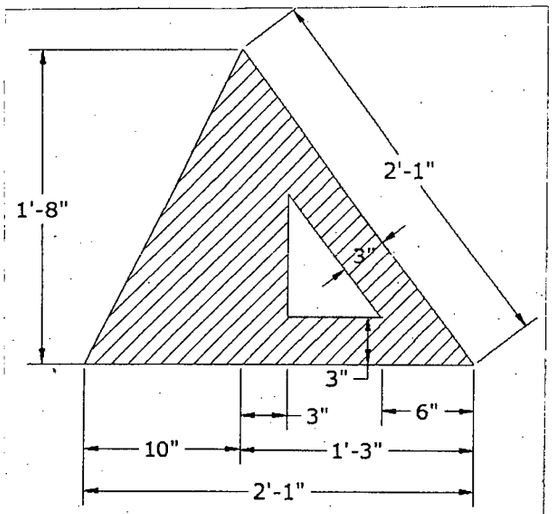

Figure 1

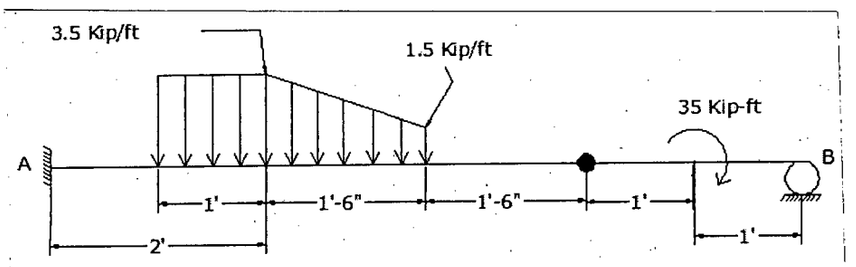

Figure 2

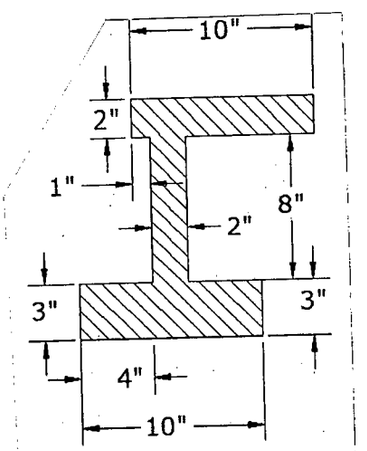

Figure 3

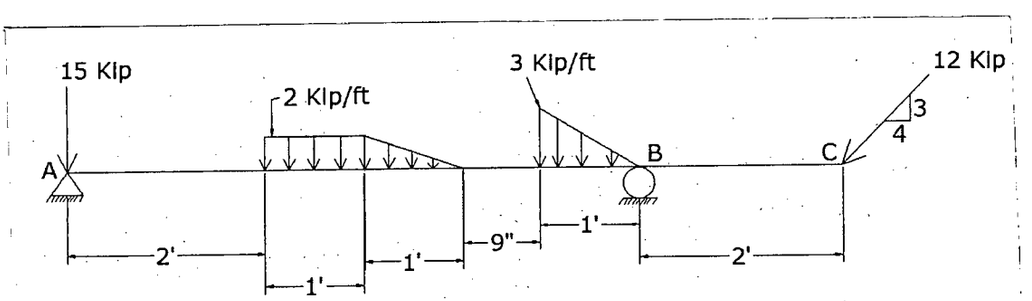

Figure: 4

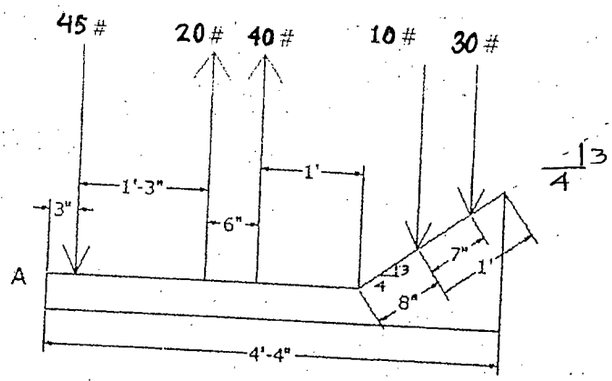

Figure 5

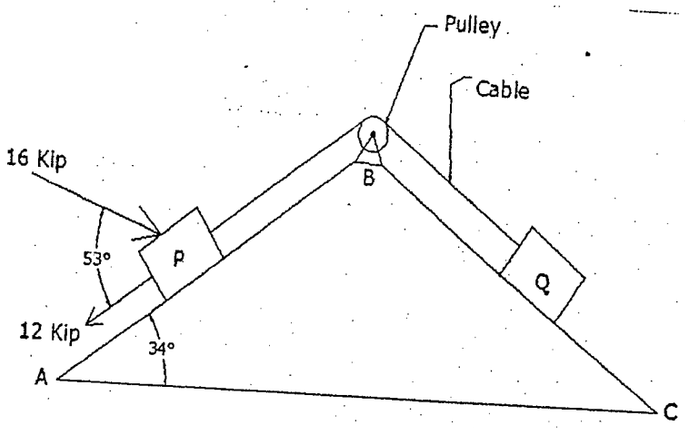

Figure 6

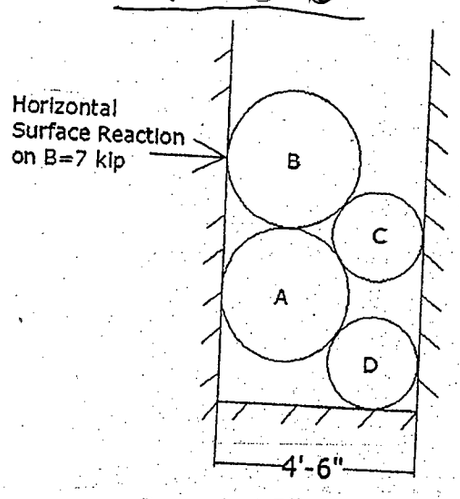

Figure 7

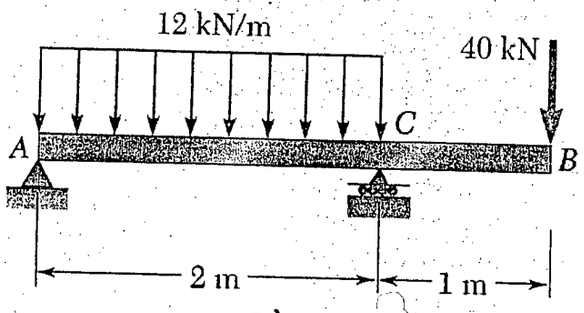

Figure 8

L-3/T-1/URP **Date : 04/08/2015**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-1 BURP Examinations 2013-2014

Sub : **WRE 309** (Introduction to Water Resources Planning)

Full Marks : 210 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. (a) What does IWRM planning mean? Discuss the role of all the four organizations involved for managing IWRM cycle. **(3+7)**

   (b) Briefly discuss how sedimentation can affect the behavior of river. Discuss the classification of river based on plan form. **(5+4)**

   (c) Briefly discuss the factors responsible for major floods in Bangladesh. Distinguish between structural and non-structural measures of flood mitigation. **(4+5)**

   (d) What are the functions of permeable and impermeable groyne? List down the low cost river training measures available. **(4+3)**

2. (a) Write short note on furrow irrigation and check flooding. What are the relative advantages of furrow irrigation over check flooding? **(3+3+2)**

   (b) Discuss (i) Degrading river (ii) Different types of Delta (iii) Secondary flow. **(4+4+3)**

   (c) Distinguish different levels of water resources planning. Write down the general steps of water resources planning. **(4+3)**

   (d) How stakeholders involvement can bring positive impact on IWRM planning? What are the different steps of IWRM planning cycle? **(4+5)**

3. (a) Write down the social considerations of IWRM. What are the general steps followed in EIA in any major resources project? Discuss with example. **(4+6)**

   (b) Write short note on **(3+3+3)**

   (i) Canal distribution system (ii) Sub-surface irrigation (iii) Types of sprinkler system.

   (c) Write down the functions of hydraulic dredger. What are the data required while planning a dredging project. **(4+3)**

   (d) What are the essential requirements for open channel method of navigation? Explain how contraction work and artificial cutoff can improve open channel navigation. **(3+6)**

4. (a) What are the relative advantages and disadvantages of using surface water for irrigation? Differentiate watershed canal and side slope canal. **(4+3)**

   (b) Write short notes on – **(3+3+3+3)**

   (i) IWT status in Bangladesh (ii) Classification of delta (iii) Physical factors affecting waterborne transport (iv) Planning of dredging.

Contd P/2

WRE 309/URP

Contd ... Q. No. 4

(c) How IWRM is integrated across levels and sectors? Briefly explain the key water resources management functions in IWRM. **(4+4)**

(d) Distinguish the functions of river basin organizations and national apex bodies in IWRM. Discuss any one of the methods of water pricing. **(4+4)**

SECTION – B

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

5. (a) Define (i) DAD (ii) Rating Curve. **(2 ½ ×2=5)**

(b) The following data obtained in a stream-gauging operation. A current meter with a calibration equation V = 0.32N + 0.032) m/s, where N = revolutions per second was used to measure the velocity at 0.6 depth. Using the mid-section method, calculate the discharge in the stream. **(15)**

Distance from right bank (m)	0	2	4	6	9	12	15	18	20	22	23	24
Depth (m)	0	0.50	1.10	1.96	2.25	1.85	1.75	1.65	1.50	1.25	0.75	0
Number of revolutions observation	0	80	83	131	139	121	114	109	92	85	70	0
Time (s)	0	180	120	120	120	120	120	120	120	120	150	0

(c) For a river, the estimated flood peaks for two return period by the use of Gumble's method are as follows: **(10)**

Return period (years)	Peak flood (m^3/s)
100	435
50	395

What flood discharge in this river will have a return period of 1000 years?

(d) Explain various methods of precipitation. **(5)**

6. (a) Define "Unit Hydrograph". What is the practical application of UH in the water resource planning and development activities? **(5)**

(b) Differentiate between: **(6)**

(i) Hydrologic and Hydraulic routing

(ii) Reservoir and Channel routing

(c) Calculate the potential evapotranspiration from a lake in an area near New Delhi in the month of October by Penman's formula. The following data are available: **(12)**

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Contd ... Q. No. 6(c)

Latitude: 32°N

Elevation: 200 m (above sea level)

Mean monthly temperature: 19°C

Mean relative humidity: 75%

Mean observed sunshine hour: 10 h

Wind velocity at 2 m height: 80 km/day

$$Hn = Ha(1 - r)\left(a + b\frac{n}{N}\right) - \sigma T^4 (0.56 - 0.092\sqrt{ea})\,(0,10 + 0.90\frac{n}{N})$$

$$Ea = 0.35\left(1 + \frac{U2}{160}\right)(e_w - e_a)$$

(d) The following ordinates of the hydrograph of surface runoff resulting from 4.5 cm of rainfall excess of duration 8 h in a catchment are as follows: **(12)**

Time (h)	0	8	13	21	28	32	35	41	45	55	61	91	98	115	138
Discharge (m^3/s)	0	40	210	400	600	820	1150	1440	1510	1420	1190	650	520	290	0

Determine the ordinates of the 8-h UH for this catchment.

7. (a) Define "Confined Aquifer". Explain head decreases linearly with x. **(2+6=8)**

(b) Derive the equation of transmissivity for steady radial flow in an unconfined aquifer. **(12)**

(c) Define : (i) Hydraulic conductivity (ii) Storage co-efficient. **(4)**

(d) A 30 cm well fully penetrates an unconfined aquifer of saturated depth 25 m. When a discharge of 2100 lpm was being pumped for a long time, observation wells at radial distances of 30 and 90 m indicated drawdown of 5 and 4 m respectively. Estimate the coefficient of permeability and transmissivity of the aquifer. What is the drawdown at the pumping well? **(11)**

8. (a) What is well development? Briefly describe various methods of well development. **(1+7=8)**

(b) Derive the idealized natural equilibrium for fresh water and salt water according to Ghyben-Herzberg relationship. **(6)**

(c) Discuss sequence of activities preceding the start of groundwater management investigations. **(7)**

(d) Briefly explain different sources and causes of pollution of groundwater. **(14)**

No.	Questions	Marks

Table1.1 Mean monthly solar radiation at top of atmosphere,Ha in mm of evaporable water/day

North latitude	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0°	14.5	15.0	15.2	14.7	13.9	13.4	13.5	14.2	14.9	15.0	14.6	14.3
10°	12.8	13.9	14.8	15.2	15.0	14.8	14.8	15.0	14.9	14.1	13.1	12.4
20°	10.8	12.3	13.9	15.2	15.7	15.8	15.7	15.3	14.4	12.9	11.2	10.3
30°	8.5	10.5	12.7	14.8	16.0	16.5	16.2	15.3	13.5	11.3	9.1	7.9
40°	6.0	8.3	11.0	13.9	15.9	16.7	16.3	14.8	12.2	9.3	6.7	5.4
50°	3.6	5.9	9.1	12.7	15.4	16.7	16.1	13.9	10.5	7.1	4.3	3.0

Table1.2 Mean monthly values of possible sunshine hours,N

North latitude	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0°	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1
10°	11.6	11.8	12.1	12.4	12.6	12.7	12.6	12.4	12.9	11.9	11.7	11.5
20°	11.1	11.5	12.0	12.6	13.1	13.3	13.2	12.8	12.3	11.7	11.2	10.9
30°	10.4	11.1	12.0	12.9	13.7	14.1	13.9	13.2	12.4	11.5	10.6	10.2
40°	9.6	10.7	11.9	13.2	14.4	15.0	14.7	13.8	12.5	11.2	10.0	9.4
50°	8.6	10.1	11.8	13.8	15.4	16.4	16.0	14.5	12.7	10.8	9.1	8.1

Table1.3 Saturation vapour pressure of water

Temperature (°C)	Saturation vapour pressure e_w (mm of Hg)	A (mm/°C)
0	4.58	0.30
5.0	6.54	0.45
7.5	7.78	0.54
10.0	9.21	0.60
12.5	10.87	0.71
15.0	12.79	0.80
17.5	15.00	0.95
20.0	17.54	1.05
22.5	20.44	1.24
25.0	23.76	1.40
27.5	27.54	1.61
30.0	31.82	1.85
32.5	36.68	2.07
35.0	42.81	2.35
37.5	48.36	2.62
40.0	55.32	2.95
45.0	71.20	3.66

Table1.4 Usual ranges of values of r

Surface	Ranges of r values
Close ground crops	0.15-0.25
Bare lands	0.05-0.45
Water surface	0.05
Snow	0.45-0.95

L-3/T-1/URP **Date : 08/08/2015**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-1 BURP Examinations 2013-2014

Sub : **HUM 225** (Accounting)

Full Marks: 140 Time : 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.

SECTION – A

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

1. (a) What is cost structure? Suppose company A's cost structure includes costs that are mostly variable, where as company B's cost structure includes costs that are mostly fixed. In a time of increasing sales, which company will tend to realise the most rapid increase in profits? Explain briefly. **(5 ⅓)**

(b) North Wood Company manufactures basketballs that sell for Tk. 25 each. Variable costs are Tk. 15 per ball. Last year, the company sold 30,000 balls, with the following results: **(18)**

	Tk.
Sales (30,000 balls)	750,000
Less: Variable costs	450,000
Contribution margin	300,000
Less: Fixed costs	210,000
Net income	90,000

Requirement:

(i) Compute the CM ratio, the break-even point in balls and the degree of operating leverage at last year's level of sales;

(ii) If variable costs increases by Tk. 3 per ball next year and the selling price per ball remains constant at Tk. 25, what will be the new CM ratio and break-even point in balls?

(iii) Refer to the data (ii) above. How many balls will have to be sold next year to earn the same net income as last year?

(vi) Refer to the original data. The company is discussing the construction of a new plant which would slash variable costs per ball by 40% and would cause fixed costs to double in amount per year. Prepare a contribution format income statement assuming 30,000 balls will be produced and sold. Would you recommend the construction of the new plant?

Contd P/2

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2 (a) Describe the differences between absorption costing method and variable costing method. **(4⅓)**

(b) Consider the following data relating to Stratford Manufacturing company for the period ended on December 31, 2014: **(19)**

Cost data:

Variable manufacturing costs:	
Direct materials	Tk. 25
Direct labour	12
Variable manufacturing overhead	13
Variable selling and administrative overhead	10
Fixed manufacturing overhead	250,000
Fixed selling and administrative overhead	150,000
Production and Sales Data:	
Units produced	25,000 units
Units sold	20,000 units
Unit selling price	Tk. 100

Requirements:

(i) Compute unit product cost under absorption costing and variable costing methods,

(ii) Prepare income statements under absorption costing and variable costing methods.

(iii) Explain the reason for any difference between the net incomes under the two costing methods.

3. (a) What is meant by the term cost behaviour? Classify costs according to cost behaviour and discuss them with examples. **(5⅓)**

(b) The data below have been taken from the cost records of Atlanta Processing Company. The data relate to the cost of operating one of the company's processing facilities at various levels of activity: **(10)**

Month	Unit processed	Total cost (Tk.)
January	8,000	14,000
February	4,500	10,000
March	7,000	12,500
April	9,000	15,500
May	3,750	10,000
June	6,000	12,500

Contd P/3

Contd... Q. No. 3(b)

Requirements:

(i) Using the high-low point method, determine the cost formula for processing cost of the company by calculating variable cost per unit and the total fixed cost for the period.

(ii) What will be the total processing cost, if the company processed 3000 units during the month of July (Use the cost formula you derived above).

(iii) What is the major disadvantage of high-low point method?

(c) Listed below are a number of costs typically found in organisations. Classify them as variable, mixed or fixed cost. **(8)**

(i) Property taxes, factory;

(ii) Boxes used for packing detergent produced by the company.

(iii) Advertising by a computer training centre;

(iv) Depreciation on Cafeteria equipment;

(v) Sugar used in soft-drink production;

(vi) Electricity used in operating machines;

(vii) Peaches used in canning fruit;

(viii) Microchips used in producing calculators.

4. (a) Name the three types of inventories that appear on a manufacturer's balance sheet. Define each of them with an example. **(3 ⅓)**

(b) Various cost and sales data for Meriwell Company for the just ended year are as follows: **(14)**

	Tk.
Selling expenses	140,000
Beginning raw materials	90,000
Ending raw materials	60,000
Plant utilities	36,000
Direct labour	300,000
Depreciation, plant equipment	162,000
Purchase of raw materials	750,000
Sales	30,00,000
Insurance for factory	40,000
Indirect labour	150,000
Maintenance for plant equipment	87,000
Directors fees	130,000

Contd P/4

HUM 225/URP

Contd... Q. No. 4(b)

	Tk.
Advertisement expenses	45,000
Sales manager's salary	20,000
Salary of the accountants	50,000
Beginning work-in-process	180,000
Ending work-in-process	100,000
Beginning finished goods	260,000
Ending finished goods	210,000
Clearing supplies, factory	7,000
Rent (⅔ for factory, ⅓ for office)	120,000
Gas and water, factory	2,500

Requirement:

(i) Prepare a cost of goods sold statement,

(ii) Prepare an income statement.

(c) What is meant by Tax? Classify tax on the basis of incidence, progression and base. Briefly discuss the tax system of Bangladesh. **(6)**

SECTION – B

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

5. (a) Are the following events recorded in the accounting records? Explain your answer in each case. **(8)**

(i) The owner of the company dies.

(ii) Supplies are purchased on account.

(iii) An employee is fired.

(iv) The owner of the business withdraw cash from the business for personal use.

(b) Bill Thomas's transactions related to his grocery shop are follows for May— **(10+5⅓)**

* Invested Tk. 1000 each to start the shop.
* Paid Tk. 4000 cash for shop rent
* Sell goods — in cash Tk. 2000 and on credit Tk. 8000
* Paid employee salary Tk. 2000
* Cash collected for selling on account in transaction amount Tk. 8000.

Required:

(i) Prepare a tabular analysis for the transactions, using the columns heading: Cash, Accounts Receivable, Bills Capital, Revenue an d Expenses.

(ii) From the analysis prepare the Income Statement.

Contd P/5

HUM 225/URP

6. (a) What are the limitations of trial balance? **(5)**

(b) James Kent is a professional. During the first month of operations of his service organization, the following events and transaction occurred: **(15+3⅓)**

* Invested Tk. 25000 cash
* Hire employee at a salary of Tk. 2000 per month.
* Purchase supplies on account of Tk. 2500.
* Paid office rent Tk. 10000 cash.
* Provide service to customer and get cash Tk. 20000.
* Paid dues on purchase supplies.
* One relative died in accident of James.
* Purchase office equipment on account Tk. 10000.
* Service provided and billed Tk. 5000.
* Withdraw cash Tk. 1000 from the organization.

Required:

(i) Record Journal entries in appropriate format,.

(ii) Prepare only cash ledger.

7. (a) What are the types of adjusting entry? **(3⅓)**

(b) Kale Company started their business on May 1, 2013. The trial balance at May 31 is as follows: **(20)**

Kale Company
Trial Balance
May 31, 2012

Account Title	Debit (Tk.)	Credit (Tk.)
Cash	8000	
Accounts Receivable	4000	
Prepaid Insurance	2400	
Supplies	1500	
Equipment	12000	
Accounts payable		3800
Unearned service revenue		3000
capital		20000
Service Revenue		6000
Salary expenses	3000	
Rent expenses	1900	
	32800	32800

Contd P/6

HUM 225/URP

Contd... Q. No. 7(b)

Other Data:

→ Unused supplies on hand at May 31, 2012 was Tk. 500

→ Travel expense incurred but not paid on May 31, 2012 Tk. 350.

→ Insurance policy is for 2 years.

→ Tk. 1000 of unearned revenue is earned.

→ Rent accrued but not paid for month Tk. 900.

Required:

(i) Prepare adjusting entries.

(ii) Prepare an adjusted trial balance as of May 31, 2012.

8. (a) Trial balance for Steve Company are as follows: **(17 ⅓)**

Steve Company

Trial Balance

December 31, 2011

Account Title	Debit (Tk.)	Credit (Tk.)
Cash	20000	
Accounts Receivable	11000	
Supplied	1500	
Prepaid Insurance	2000	
Office Equipment	24000	
Accumulated depreciation - office equipment		5600
Notes payable		26900
Accounts payable		6100
Salaries payable		2400
Interest payable		600
Capital		16000
Drawings	7000	
Service Revenue		61000
Advertising expense	8400	
Supplies expense	4000	
Depreciation expense	5600	
Insurance expense	3500	
Salaries expense	31000	
Interest expense	600	
	118600	118600

Contd P/7

HUM 225/URP

Contd... Q. No. 8(a)

Other Data:

→ Salaries are accrued and unpaid Tk. 500.

Required:

(i) Prepare Income Statement (Single-step)

(ii) Prepare Owner's Equity Statement.

(iii) Prepare a classified balance sheet as on December 31, 2011 assuming that Tk. 10000 of the note payable become due in 2012 (long-term).

(b) Determine: **(6)**

(i) Profit margin ratio

(ii) Return on Total asset

(iii) Current Ratio.
