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L-3/T-1/B.URP

Date : 06/10/2013

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-1 B. Urp. Examinations 2011-2012

Sub : **HUM 225** (Accounting)

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 any **THREE**.

1. (a) Given below is the Cost Data of ZZZ company for the year 2012.

(15 1/3)

(All the figures are in Taka.)

Material Purchase	1,80,000	
Returns & Allowances of material	2,000	
Carriage in	2,500	
Direct Labour Cost	75,000	
Factory machine insurance	20,200	
Manufacturing Equipment repair cost	30,000	
Factory rent	15,000	
Sales Revenue	3,33,000	
Promotional expense	40,000	
Indirect labour	70,000	
Office telephone expense	3,000	
Manager's salary	1,50,000	
<b>Inventory in units</b>	<b>Beginning of the year</b>	<b>Ending of the year</b>
Raw Materials	42,000	39,500
Work in process	12000	8000
Finished Goods	58000	56000

Requirements:

(i) Prepare a Cost Statement for the year 2012.

(ii) Calculate what is the net income.

(b) Give Journal Entries for the following transactions.

(8)

Materials Purchased on Account Tk. 50000.

Direct materials used Tk. 30000 and indirect material Tk. 15000.

Direct and Indirect labor paid Tk. 20000 and 16000 respectively.

Manufacturing Overhead applied for Tk. 45000.

Actual Overhead incurred on account Tk. 40000.

Goods were completed and transferred to Finished Goods Account.

Sales of products on account for Tk. 75000.

Cost of goods sold is 60% of finished goods.

Contd ..... P/2

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**HUM 225(URP)**

2. (a) What are the factors that comprise CVP Analysis? How does contribution margin differ from net operating income? (5 1/3)

(b) V company sells telephone wire. The company's cost and sales data is given below: (18)

Sales (20000) units at 60 taka per unit

Variable expense 45 taka per unit

Fixed expense 2,40,000 taka

Requirements:

(i) Prepare a Contribution Margin Income Statement.

(ii) Compute the company's Contribution Margin ratio and variable expense ratio.

(iii) Compute the company's break-even point in sales and in units. Use the contribution margin method to answer. Compute Margin of Safety in taka and in percent.

(iv) Assume that the company's sales increase by 4,00,000 taka next year. If everything remains unchanged, how much will be <sup>the</sup> company's net operating income increase?

(v) Refer to the original data. If the company wants to sack one employee who was being paid 70000 taka salary and also expects to decrease the variable cost per unit by 15% what will be the change in net operating income?

3. (a) The following data are given for calculation of Variances. (18)

Number of Finished Goods 900 units.

Material:

Standard Cost per unit 3 units @ Tk. 4 per unit

Actual units purchased 2820 units @ Tk. 3.9 per unit

Material Used 2750 units.

Labor:

Standard Cost per unit 2 hours @ Tk.5 per hour

Total Direct Wages paid 2000 hours @ Tk. 5.2 per hour

Standard hours allowed 1800 hours

Overhead:

Actual Tk. 4800

Budgeted fixed overhead 2000 hours @ Tk. 0.80

Standard Overhead 1800 hours @ Tk. 2.8

Requirements: Calculate the following variances:

(i) Material Price Variance and Material Quantity Variance

(ii) Labor Rate <sup>variance</sup> and Labor Efficiency Variance

(iii) Volume Variance and Controllable Variance

**HUM 225(URP)**

**Contd ... Q. No. 3**

(b) Write down the classification of Tax on the basis of structure of tax rate. Which tax system is followed in Bangladesh? (3 1/3)

(c) Show the effects of Residential Status in assessing income for tax purpose. (2)

4. (a) What is the difference between Income year and Assessment year? Mr. Jalil stayed in Bangladesh from 1st August, 2008 to 31st December, 2008 and then left for London. What will be his residential status in the income year 2008-2009? (3 1/3)

(b) Mr. Noman is an executive who generated following income during the year ended 30.06.2012: (20)

Basic salary Tk. 8000 per month.

House rent allowance Tk. 5,000 per month.

Conveyance allowance Tk. 1000 per month.

Mobile bill allowance Tk. 500 per month.

Two festival bonus each equal to Tk. 10,000.

Commission received total Tk. 20,000 for the year.

Overtime allowance Tk. 30,000 for the year.

Income from sole proprietorship business Tk. 80,000.

Dividend from limited company share Tk. 5,400.

Interest on bank deposit Tk. 2,700.

Interest from tax free government securities Tk. 8,000.

Interest from approved commercial securities Tk. 7,000

Mr. Noman incurred the following investments and expense during the year:

Life Insurance Premium paid Tk. 20,000; Policy value Tk. 200,000.

Investment in stocks and shares of listed companies Tk. 60,000.

Investment in Savings Certificate Tk. 30,000.

Donation to a charitable hospital Tk. 10,000.

Donation to Zakat Fund Tk. 5,000.

Required: Calculate taxable income and net tax liability for Mr. Noman for the Income Year 2011-2012.

**HUM 225(URP)**

**SECTION – B**

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

5. (a) What is accounting equation? Write a brief note on different elements of accounting equation. (5)

(b) Mr. Kabir started his own business "Kabir Enterprise" on June 1, 2012. The following transactions were completed during the month: (18 1/3)

June-1:	Kabir invested Tk. 15,000 cash to start the enterprise.
June-2:	Paid Tk. 600 cash for June office rent.
June-11:	Purchased office equipment for Tk. 3000 cash.
June-14:	Incurred Tk. 700 advertising cost in the Daily News, on account.
June-17:	Paid Tk. 800 cash for office supplies.
June-19:	Earned Tk. 11,000 for services rendered, Tk. 3000 cash is received from clients and the balance of Tk. 8000 is billed to clients on account.
June-23:	Withdrew Tk. 500 cash for personal use.
June-28:	Paid to the Daily News amount due in the transaction of June 14.
June-29:	Paid employees' salaries Tk. 2200.
June-30:	Received Tk. 4000 in cash from clients who previously been billed in the transaction of June 19.

**Required:**

(i) Prepare a tabular analysis of transaction using the following column headings: Cash, Accounts receivable, Supplies, Office equipment, Accounts payable and Kabir Capital.

(ii) From an analysis of the owner's equity columns <sup>compute</sup> ~~complete~~ the net income or net loss for June.

6. (a) "Accounting is an information system" - Explain. (3 1/3)

(b) The unadjusted trial balance of Marine Company at January 31, 2012 is shown below: (20)

Accounts Title	Debit (Tk.)	Credit (Tk.)
Cash	15,200	
Supplies	2,500	
Prepaid insurance	600	
Office equipment	5000	
Notes payable		5,000
Accounts payable		2500

**HUM 225(URP)**

**Contd ... Q. No. 6(b)**

Unearned revenue		1200
Toma's capital		10,000
Toma's drawing	500	
Service revenue		10,000
Salaries expenses	4,000	
Utilities expenses	900	
	<u>28,700</u>	<u>28,700</u>

Analysis reveals the following data:

- Supplies on hand Tk. 1500 at January 31.
- Insurance policy is for two years.
- Depreciation per month Tk. 200 for office equipment.
- Tk. 500 of unearned revenue is still unearned at month end.
- Services provided but not recorded at January 31 is Tk. 500.
- Unpaid salary is Tk. 700.

**Required:**

- (i) Explain the principles that are related with the adjusting entries.
- (ii) Journalise the adjusting entries for the items above at January 31, 2012.
- (iii) Prepare an adjusted trial balance for January, 2012.

7. The adjusted trial balance for premium Bus service is as follows:

(23 1/3)

Premium Bus Service  
Adjusted Trial Balance  
December 31, 2010

Accounts Title	Debit (Tk.)	Credit (Tk.)
Cash	8100	
Accounts receivable	10,800	
Supplies	1,500	
Prepaid advertisement expense	2,000	
Office equipment	24,000	
Accumulated depreciation on office equipment		5,600
Notes payable		15,000
Accounts payable		6100
Salaries payable		2400
Interest payable		600
Capital		15,800

**HUM 225(URP)**

**Contd ... Q. No. 7**

Drawing	7,000	
Service revenue		56,000
Insurance	3500	
Supplies expenses	4000	
Depreciation	5600	
Advertising expenses	8400	
Salaries expenses	31000	
Interest expenses	600	
Unearned service revenues		5000
	<u>106,500</u>	<u>106,500</u>

**Required:**

- (i) Prepare an income statement for the period.
- (ii) Prepare a statement of owner's equity for the period. Additional investment made by the owner during the year was Tk. 5800.
- (iii) Prepare a classified balance sheet on December 31, Tk. 9000 for the notes payable become due in 2011.

8. (a) Briefly discuss the importance of financial statement analysis. (3)
- (b) Following is the balance sheet of AB Ltd. as on 31st December, 2010: (8)

AB Ltd.  
Balance sheet  
as at 31st December 2010

Assets	Amount Tk.	Liabilities & Owner's equity	Amount Tk.
Plants machinery	14,00,000	Accounts payable	60,000
Office equipment	775,000	VAT payable	35,000
Cash and bank	105,000	Unpaid salaries	100,000
Closing inventory	120,000	Mortgage loan	6,00,000
Prepaid insurance	20,000	Unearned service revenues	150,000
Accounts receivable	75,000	Capital	15,50,000
	24,95,000		24,95,000

**Other information:**

Sales	Tk. 47,50,000
Gross profit	20,00,000
Net profit after tax	950,000
Tax rate	40%

**HUM 225(URP)**

**Contd ... Q. No. 8(b)**

Required:

Calculate the following:

- (i) Current ratio; (ii) Quick ratio; (iii) Gross profit ratio; (iv) return on investment;
- (v) Debt-equity ratio; (vi) proprietary ratio; (vii) Inventory turnover; (viii) receivable turnover.

(c) Maria Helen, a business graduate, has started her own consulting firm 'Helen M. Consulting' on May 2010, The following transactions occurred during the month of May:

**(12 1/3)**

May -1:	Maria invested Tk. 200,000 cash to start business.
May -2:	Purchased supplies for Tk. 12,000; paid Tk. 6,000 in cash and the balance on account.
May -8:	Paid cash Tk. 1000 to the Daily Prothom Alo for advertising expenses.
May -12:	Service provided to the clients Tk. 5000 on account.
May -20:	Withdrew Tk. 2000 cash from the business for personal use.

Required:

- (i) Journalise each transaction
  - (ii) Prepare cash ledger.
-

L-3/T-1/BURP

Date : 29/09/2013

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-1 B. URP Examinations 2011-2012

Sub : **CE 361/327** (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) Write down 5 (five) points on which selection of Factor of Safety (F.S) depend. (10)
- (b) Locate the centroid of a hemispherical volume whose radius is 'r'. (10)
- (c) Determine  $I_y$  of the shaded area as shown in Figure-1 (area between the curve  $x^2 = by$  and line  $y = ax$ ) using the elementary area  $dA$  as shown in the Figure-1. (15)

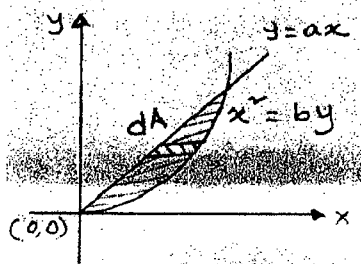


Figure - 1

2. (a) Say, 'Moment of Inertia' of an area about two perpendicular axes passing through a particular point is known. Derive an expression to determine 'Moment of Inertia' about any axis passing through that point and hence determine the corresponding axis for which 'radius of gyration' is minimum. (15)
- (b) Find  $I_x$  and  $I_y$  for the channel section shown in Figure-2. (20)

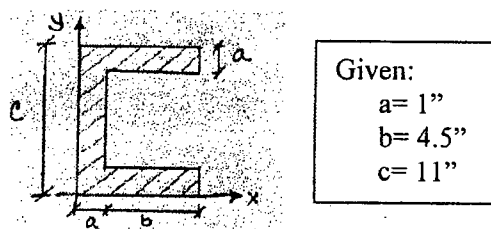


Figure - 2

3. (a) The rigid bar BDE (Figure-3) is supported by two links AB and CD. Link AB is made of aluminum ( $E = 75$  GPa) and has a cross sectional area of  $450 \text{ mm}^2$ ; link CD is made of steel ( $E = 200$  GPa) and has a cross sectional area of  $550 \text{ mm}^2$ . Determine the maximum force 'P' for which neither the stresses in the links exceed 200 MPa nor the deflection of point E exceeds 2.5 mm. (25)

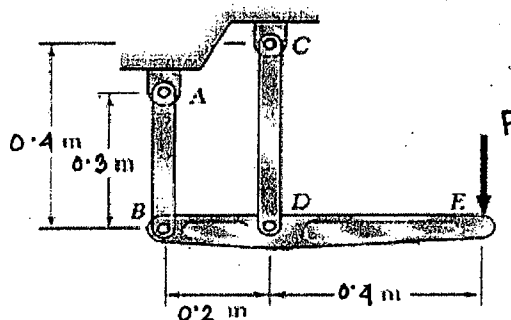


Figure - 3

Contd ..... P/2



**CE 361 /327**

**Contd ... Q. No. 3**

(b) A pin is used to attach a clevis to a rope. The maximum force in the rope with will be 70 kN. If the maximum shear stress allowed in the pin is 40 MPa. calculate the diameter of the pin. (10)

4. (a) By stating the necessary assumptions, prove that for isotropic material  $0 < \nu < \frac{1}{2}$ . (10)

(b) Write down the mathematical expressions of two theorems of 'Pappus & Guldinus'. (5)

(c) Draw Shear force and Bending Moment Diagram for the loaded beam shown in Figure-4. (20)

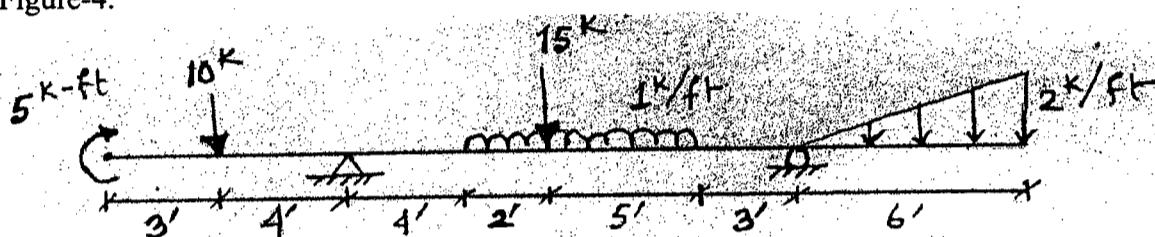


Figure - 4

**SECTION - B**

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

5. (a) In the system of sheaves shown in Figure-5, what force F will hold a weight of  $W = 6000$  lbs in equilibrium? There are no frictional losses at the axes. (10)

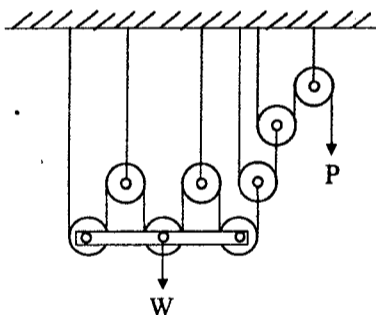


Figure- 5

(b) Determine shear forces and bending moments at sections through b and d of the beam shown in Figure-6. (25)

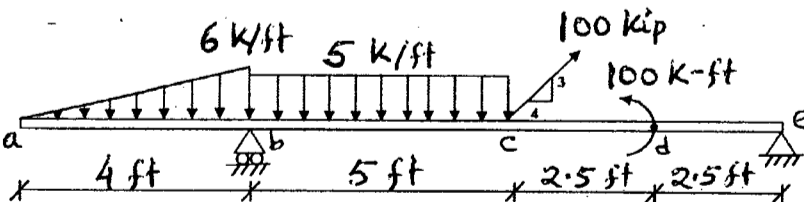


Figure- 6

6. (a) Draw shear force and bending moment diagrams of the beam shown in Figure-7. (25)

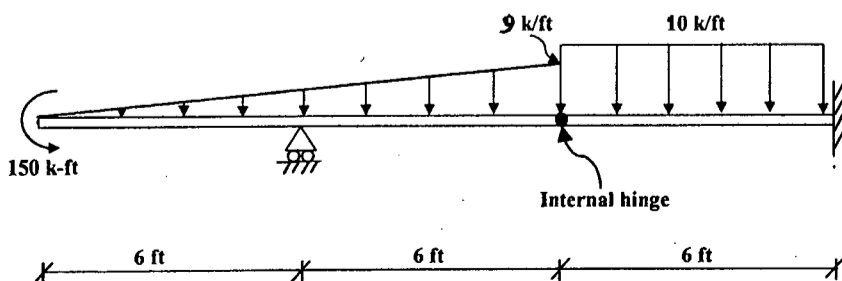
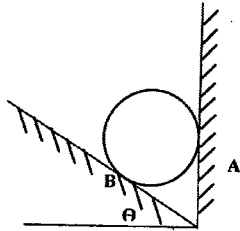


Figure- 7

**CE 361 /327**

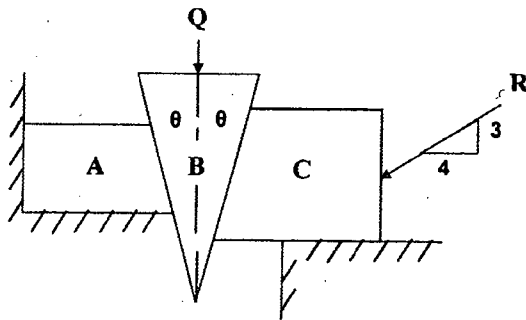
**Contd ... Q. No. 6**

(b) A 6000 lbs sphere rests on a smooth plane inclined at an angle of  $\theta = 30^\circ$  with the horizontal and against a smooth vertical wall (Figure-8). What are the reactions at the contact surface A and B? Assume that the sphere is subjected to a concurrent force system. (10)



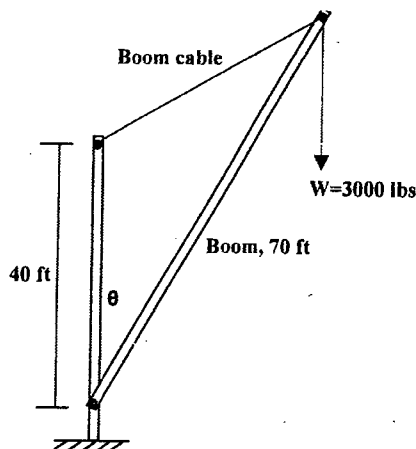
**Figure- 8**

7. (a) In Figure-9, let  $W_A = 2500$  lbs,  $W_B = 1000$  lbs,  $W_C = 4000$  lbs and force  $R = 8000$  lbs. Neglecting all friction so that the reactions are normal to the surfaces, find the force  $Q$  on top of the wedge. Assume that each body is subjected to a concurrent force system.  $\theta = 7.5^\circ$ . (25)



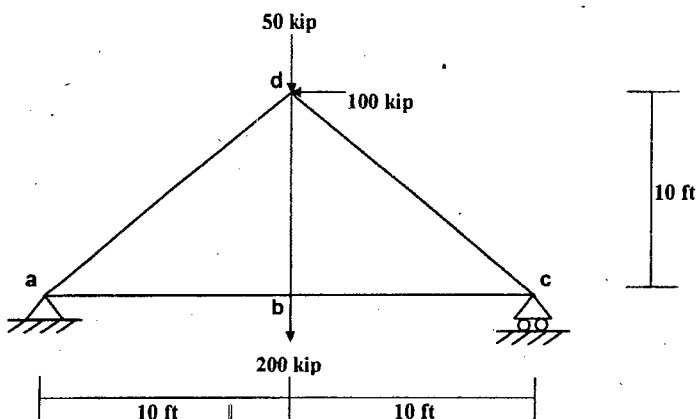
**Figure- 9**

(b) The derrick shown diagrammatically in Figure-10 supports a load of 3000 lbs. Find the tension in the boom cable and the compression in the boom. Neglect the self weight of the boom.  $\theta = 30^\circ$ . (10)



**Figure- 10**

8. (a) Find the forces on all members of the truss shown in Figure-11. (25)



**Figure- 11**

Contd ..... P/4

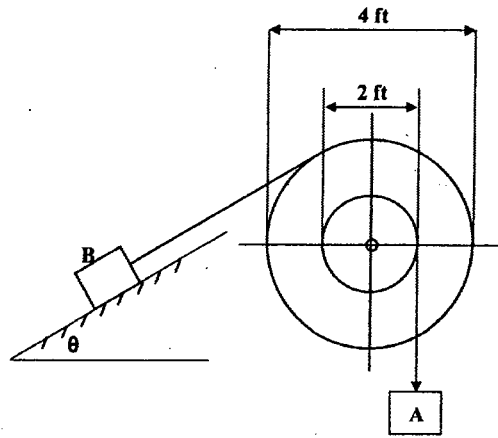
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**CE 361/327**

**Contd ... Q. No. 6**

(b) An ore car B which weighs 20 tons is balanced by a weight A as shown in Figure-12. The angle of the inclination,  $\theta$  is  $= 60^\circ$ . What should be the weight A if there is no friction at any point?

**(10)**



**Figure- 12**

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

Full Marks: 210

Time : 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.

Checked  
 Anwar  
 23/09/2013

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

1. (a) Discuss the importance of housing finance. What are the ways to strengthen formal housing finance in developing countries? **(04+09=13)**
- (b) Name the laws concerned with Real Estate sector and discuss important Real Estate Regulations with special reference to Real Estate Development and Management Act, 2010. **(15)**
- (c) Draw normal demand and supply curve. Depict the market condition of neither a shortage nor a surplus of apartment housing using the same curve. State the condition of shifting Market demand and supply curve. **(07)**
2. (a) Use Figure 01 to show the effects of the following changes on the optimum location of the polluting factory. Do the changes cause the optimum location to move closer to or farther from the residential area? **(12)**
  - (i) The unit commuting cost (cost per mile) increases
  - (ii) Residents become more sensitive to pollution
  - (iii) The polluting factory discovers a new method of pollution abatement that cuts abatement cost in half.
- (b) In Figure 02, large lot zoning increases the price of apartment land and decreases the price of land for single-family homes. Under what circumstances (what values of the relevant elasticities) will the zoning policy increase the total value of land in the city? **(08)**
- (c) What is Real Estate Economics? Which factors play important role in choosing a dwelling for different income households. Explain with proper graphical representation. **(4+8=12)**
- (d) What is 'Assurance of Title'? **(03)**
3. (a) In Figure 03, the equilibrium price of building permits is \$30,000. Suppose that the demand curve shifts down and intersects the supply curve at a quantity of 50 dwellings per year. What is the equilibrium price of permits? **(10)**
- (b) Consider a city where a polluting industry is separated from the residential area by a 7 mile buffer. The closer the firm to the residential district, the lower the wage and the higher the effluent fee. What is the social cost of the segregation zoning policy? In other words, if the city prevents the firm from locating at its optimum location, what is the cost to society? **(08)**
- (c) Why poor households occupy used housing? **(05)**
- (d) Explain Real Estate trade cycle with proper illustrations. **(12)**

**PLAN 321**

4. (a) Define Lemon market, Moral hazard and Adverse selection in case of securitization in Real Estate. (09)
- (b) What is Agency theory? Distinguish between Pre-investment and Post-investment relationship of principal and agent in a Real Estate Management procedure. (04+10=14)
- (c) Suppose that a city has recently proposed the rezoning of a 12 acre parcel of land, from low density use (1 dwelling/acre) to high density use (20 dwellings/acre). (12)
- (i) Who will support the zoning change? Who will oppose the rezoning?
- (ii) Describe a policy under which all parties will agree to the rezoning if infact the rezoning is efficient.

**SECTION - B**

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

5. What should be the characteristics of good or adequate housing according to the planning guidelines and principles? Explain with examples. (35)
6. Write short notes on the following (any five): (5×7=35)
- (a) Types of houses,
- (b) The benefits of adequate housing, with necessary diagrams,
- (c) Indicators for measuring the quality of housing,
- (d) The twelve (12) signs of a good place to live,
- (e) Micro-finance for house improvement,
- (f) Group leading for financing housing,
- (g) Community vision and principles for better planning of the city.
7. Briefly describe— (5×7=35)
- (a) Who provides loan for housing?
- (b) Who can apply for housing loan and under what conditions?
- (c) What are the sources of housing finance?
- (d) What are the barriers for accumulating capital in the public sector housing finance in Bangladesh?
- (e) What strategies should be adopted in order to increase capital in the House Building Finance Corporation of Bangladesh?
8. (a) Briefly describe the evolution of housing policy in the developing countries. (15)
- (b) Compare the housing policy of Bangladesh with that of Singapore or Hong Kong. (20)

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PLAN 321

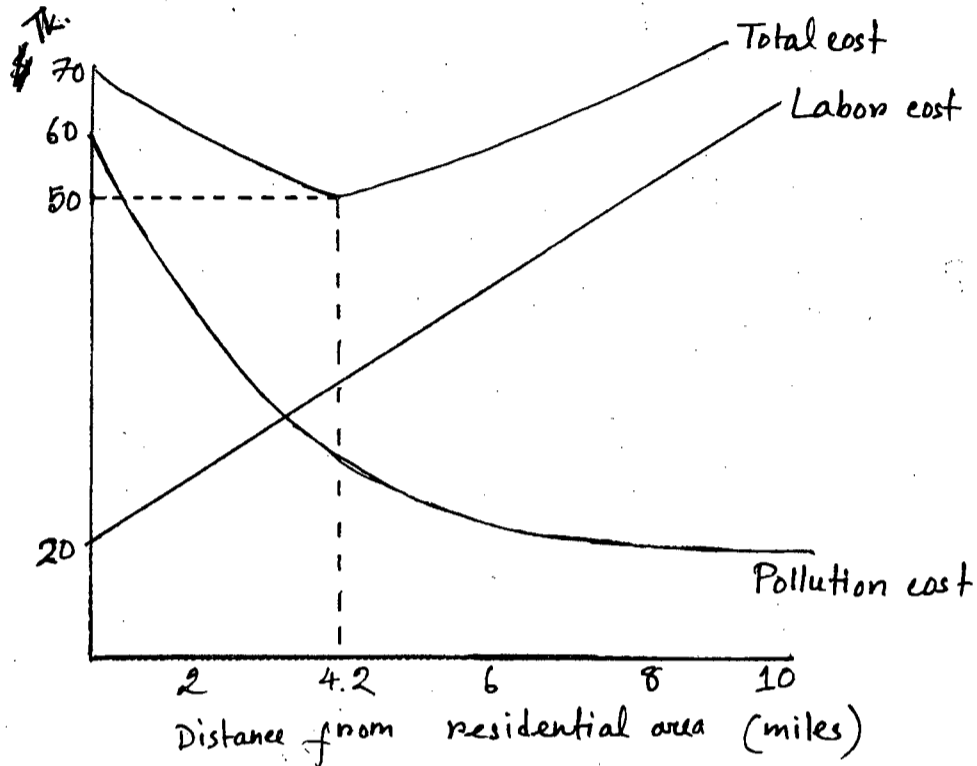


Figure 01

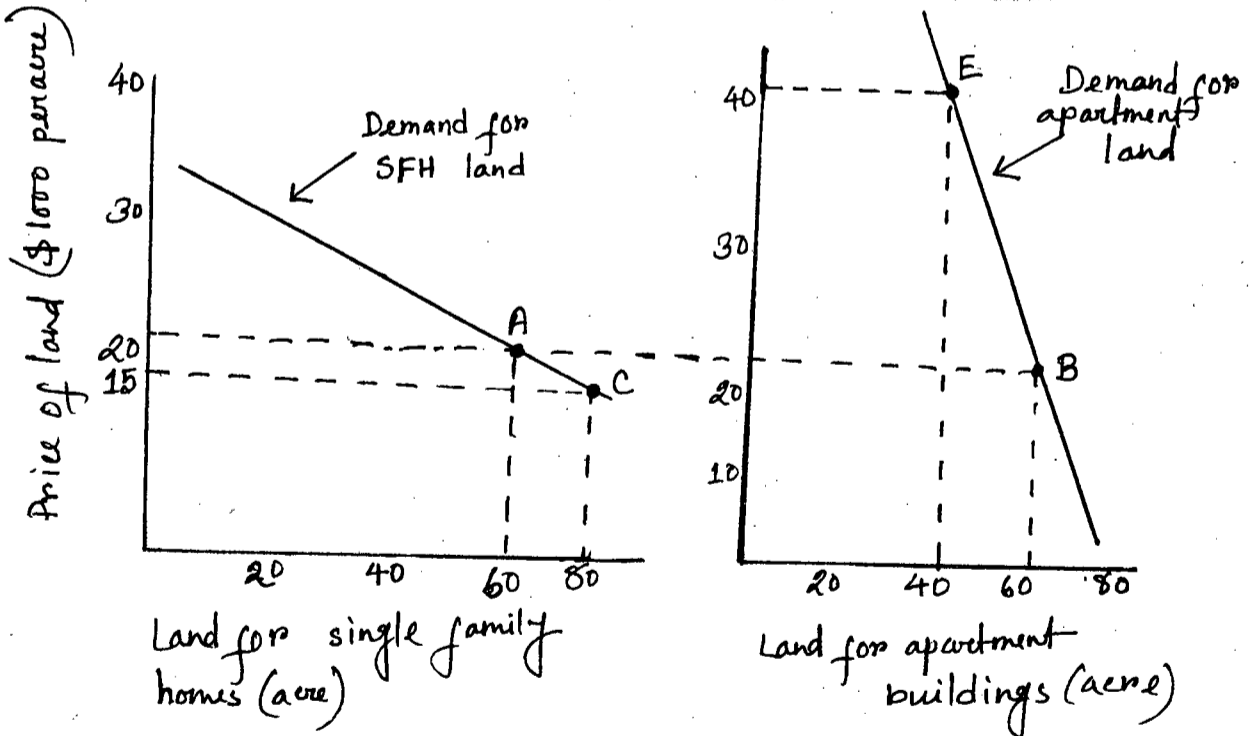
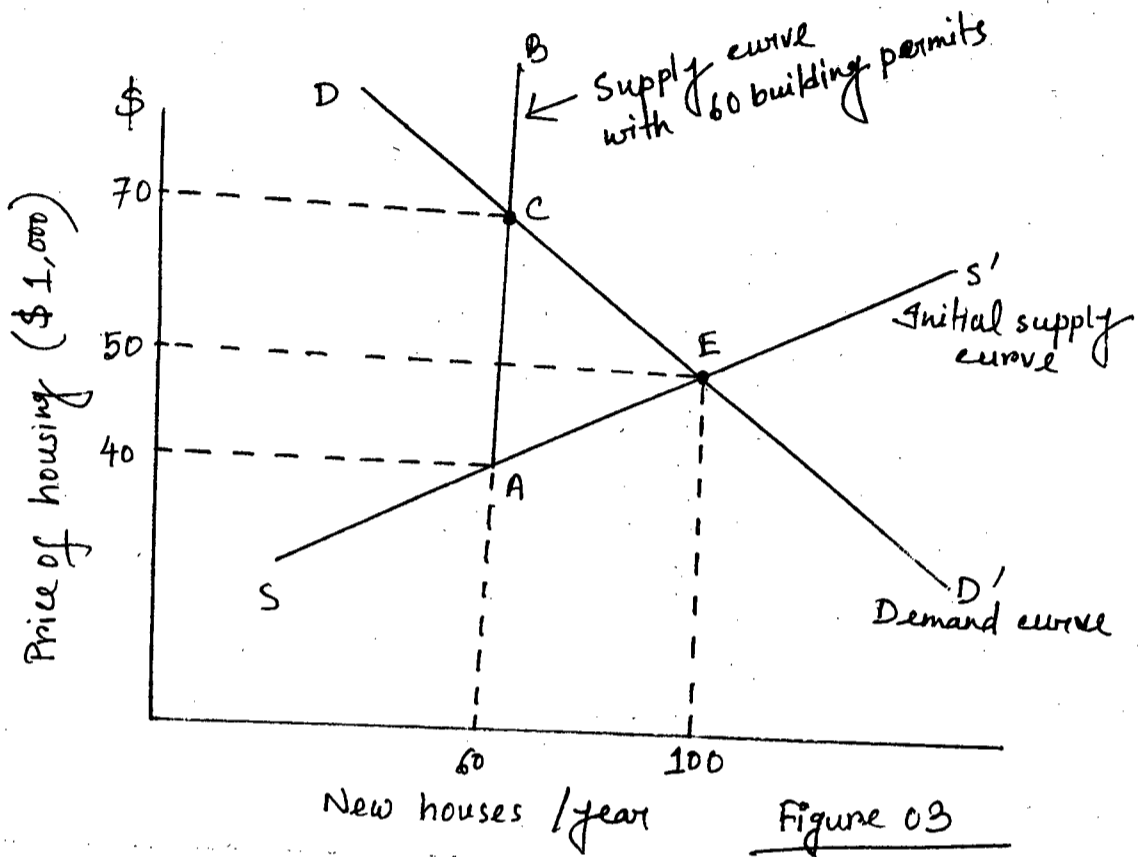


Figure 02

PLAN 321



Hazrat  
16/09/2013

L-3/T-1/URP

Date : 25/07/2013

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-1 BURP Examinations 2011-2012

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

Full Marks: 210

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 water resources planning? Briefly discuss the various levels of water resources planning with proper examples. (2+10)
- (b) Define IWRM. Discuss the rationale for water pricing in the context of IWRM. (2+6)
- (c) Briefly discuss the processes of EIA and SIA for water resources projects. (6+5)
- (d) "Public participation is necessary in every stages of water resources planning and management" — why? (4)
  
2. (a) Enlist the various stages of a river. Explain how bends are developed in an alluvial river. (2+8)
- (b) Differentiate between— (4+4)
  - (i) Perennial and non-perennial rivers
  - (ii) Aggrading and degrading rivers
- (c) Classify river training works. Describe the objectives of constructing groynes as river training structures. (6+5)
- (d) Sketch the cross sections of the following river training works— (6)
  - (i) Marginal embankment
  - (ii) Permeable groyne
  - (iii) Guide bank
  
3. (a) Enlist the various bank protection measures practiced in Bangladesh. Discuss the major components of revetment with proper sketch. (6+6)
- (b) What are the general requirements of navigable waterways in alluvial river? Describe the basic steps while planning a navigation project? (3+8)
- (c) Write short notes on— (4+4)
  - (i) Bandalling
  - (ii) Artificial cut-off
- (d) Explain why "underkeel clearance" is needed? (4)
  
4. (a) Briefly describe the status of Inland Waterway Transport in Bangladesh. Discuss the necessity of dredging in this context. (5+5)
- (b) Describe the basic dredging process. What are the objectives of such dredging? (3+7)

Contd ..... P/2



**WRE 309**

**Contd... Q. No. 4**

- (c) Draw a typical layout of an irrigation project. What are the factors that should be considered while planning an irrigation project? (3+7)
- (d) Enlist the general methods of irrigation. Write down the advantages and disadvantages of furrow irrigation. (2+3)

**SECTION – B**

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

5. (a) What are the purposes of water resources development and management? Briefly discuss the participatory approach of water resources planning. (10+4)
- (b) Describe with a neat diagram the hydrologic cycle. (5)
- (c) Briefly describe the types of precipitation based on air lifting. (8)
- (d) The average rainfall over a basin of area of 50 ha during a storm was as follows: (8)

Time (h)	0	1	2	3	4	5	6	7
Rainfall (mm)	0.0	6.0	11.0	34.0	28.0	12.0	6.0	0.0

If the volume of runoff of this storm was  $25 \times 10^3 \text{ m}^3$ . Calculate the  $\phi$ -index for the storm.

6. (a) Briefly describe different methods of determining average rainfall over a catchment. (8)
- (b) What are the considerations in siting a raingauge? Briefly describe a non-recording Raingauge. (9)
- (c) What do you mean by (i) pan coefficient (ii)  $\Phi$ -index (iii) Field capacity (iv) Potential Evapotranspiration (v) Effective rainfall? (10)
- (d) At the site of a large reservoir the average climatic data during a week are: water Temperature =  $20^\circ\text{C}$ , relative humidity = 55% and wind speed at 2 m above the ground level = 4.5 m/s. Estimate the average daily evaporation from the reservoir during that week. The saturation vapour pressure at  $20^\circ\text{C}$  is 17.54 mm of  $H_g$ . (8)
7. (a) Explain with a schematic diagram the different routes of runoff. Write about the maintenance work of a float gauge recorder. (8+5)
- (b) An urban catchment has an area of  $0.75 \text{ km}^2$ . The slope of the catchment is 0.005 and the maximum length of travel is 850 m. The maximum depth of rainfall with a 25 year return period is as below: (8)

Duration (min)	5	10	20	30	40	60
Depth of rainfall (mm)	17	26	40	50	57	62

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

If a culvert for drainage at the outlet of this area is to be designed for a return period of 25 years, estimate the required peak flow rate, by assuming runoff coefficient as 0.2.

(c) What is vertical axis current meter? Write the disadvantages of vertical axis current Meter. (4)

(d) The ordinate of a 6-h unit hydrograph are as given below: (10)

Time (h)	0	6	12	18	24	30	36	42	48	54	60	66
Ordinate of 6-h UH (m <sup>3</sup> /s)	0	20	60	150	120	90	66	50	32	20	10	0

If two storms, each of 1-cm rainfall excess and 6-h duration occur in succession, calculate the resulting hydrograph of flow. Assume base flow to be uniform at 10 m<sup>3</sup>/s.

8. (a) Briefly discuss the design considerations for an urban storm drainage system. (8)

(b) What do you mean by (i) Saturated zone (ii) Aquitard (ii) Cone of depression (iv) Specific yield (v) Invert elevation? (10)

(c) What are the assumptions necessary for the derivation of steady flow in a well in confined aquifer? Derive an equation for steady flow to a well in an unconfined aquifer. (9)

(d) A 40 cm diameter well completely penetrates a confined aquifer of Permeability 45 m/day. The length of the strainer is 20 m. under steady state of pumping the drawdown at the well was found to be 3.0 m and the radius of influence was 300 m. if the discharge is required to increase 5% from the present condition, how much the diameter of the well have to be increased? (8)

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10-09-13

L-3/T-1/URP

Date : 08/07/2013

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-1 BURP Examinations 2011-2012

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**.

1. (a) What do you understand by the term "Transportation System"? Why transportation is called a Space-Shaping Technology? (5+5=10)  
(b) What are the factors responsible for efficiency of a transport mode? (5)  
(c) Explain how changes in the various factors of land use affect trip length, trip frequency and mode choice of the residents of a city. (20)
  
2. (a) To what extent the transportation system of Dhaka city can be described as 'a balanced and integrated system'? Explain briefly with relevant examples. (6)  
(b) "Automobile cities, developed in the 20<sup>th</sup> century, create different social, economic and environmental problems" – State some of these problems and discuss about the solutions to reduce automobile dependence. (12+8=20)  
(c) All urban road system must support three functional categories of travel. Briefly describe each of these categories. (9)
  
3. (a) Describe the factors on which the minimum stopping distance of a motorized vehicle depends. (8)  
(b) BRTA is deciding on the maximum speed limit for vehicles which would travel on a newly constructed road that ends at a major intersection. Considering the roadway and traffic characteristics, a stop sign is placed 295 feet from the intersection. What should be the maximum speed limit on this road? (If required, assume standard values for roadway factors) (10)  
(c) "Better solution to a transport problem can be found outside the transport sector itself" – Do you agree with this statement? Justify your answer with relevant examples. (5)  
(d) Distinguish among the major categories of urban roads. Give examples for each category of road. (12)
  
4. (a) Explain how transportation plays an influential role in determining the urban form and land use pattern of a city. (10)  
(b) Right-turning traffic is a major problem which results in the formation of long queues at the major intersection of Dhaka city. Describe, with necessary illustrations, the various method of restricting right-turning traffic at an intersection with their merits and demerits. (15)  
(c) What is "level of service" in relation to an urban road? List the factors which determine the level of service of a road. (5+5=10)

Contd ..... P/2

**PLAN 343**

**SECTION – B**

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

5. (a) A 13 meter wide bituminous road in front of EME building of BUET is facing heavy rainfall. Parabolic camber is to be provided there. What will be the height of the crown (in mm) above edges? (Adopt camber 1 in 60). (6)
- (b) What are the different levels of measurements that can be adopted for volume study? Which one of these measurements is most suitable for intersection design and why? (3+6=9)
- (c) Write down the characteristics of O-D zones. (10)
- (d) "On-street parking should be prohibited at certain locations" – Which locations are those? Briefly discuss. (10)
6. (a) Write down the advantages of traffic rotaries. (6)
- (b) What are the factors that influence the PCE at 'intersection' and 'link'? From the following table calculate the PCE value for Bus, Rickshaw and Auto-rickshaw. (4+9=13)
- | Mode          | Headway (sec) | Width (m) | Required lateral clearance (m) |
|---------------|---------------|-----------|--------------------------------|
| Passenger Car | 2.2           | 1.8       | 1                              |
| Bus           | 4.4           | 2.5       | 1                              |
| Rickshaw      | 2.4           | 1.2       | 0.8                            |
| Auto-rickshaw | 1.2           | 1.2       | 1                              |
- (c) What do you mean by 'traffic delay'? Discuss with examples. (6)
- (d) What is an 'interchange ramp'? Briefly state different forms of interchange ramp with appropriate illustrations. (10)
7. (a) Why shoulders are kept along urban roadway? (5)
- (b) What are the differences between traffic sign and road marking? (5)
- (c) Discuss about the pictorial representation of O-D survey data. (5)

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**Contd ... Q. No. 7**

(d) A Parking Patrol Survey has been conducted on last Wednesday from 12:00 PM to 2:00 PM and 6:00 PM to 8:00 PM (total 4 hours period) at the interval of 15 minutes on the on-street parking provision of 'Japan-Bangladesh Friendship Hospital'. At that place the number of marked on-street parking spaces is 14. (20)

Collected data are given in the following tables:

Duration (min)	No. of vehicles
15	74
30	34
45	7
60	1
75	2
90	1
225	1
240	1

Time	Parking Accumulation
19:00	15
19:15	13
19:30	11
19:45	19
20:00	16

Calculate –

- (i) Average Parking Duration (in hour)
- (ii) Parking Volume (veh/hr)
- (iii) Parking Demand (veh-hr) (from 7:00 PM to 8:00 PM)
- (iv) Parking Turnover (in a period of 4 hours)
- (v) Expected number of vehicles (over 4 hours)

8. (a) Sketch the layout and dimension for a 45° angle parking. (5)

(b) Accident Research Institute (ARI) of BUET has reported that a considerable number of accidents involve pedestrians in Dhaka city. What kind of measures would you apply to increase pedestrian safety in Dhaka City? (12)

(c) What kind of data for on-street and off-street spaces are needed to be collected parking space inventory? (8)

(d) The students of URP department at BUET have conducted speed survey on Mirpur Road. They have recorded ten spot speed measurements (in km/hr) from the roadway section of Nilkhet to Kalabagan, which are as follows: (10)

50, 40, 31, 58, 65, 43, 55, 30, 49, 50

From the above data calculate time-mean speed and space-mean speed for the study section.

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