

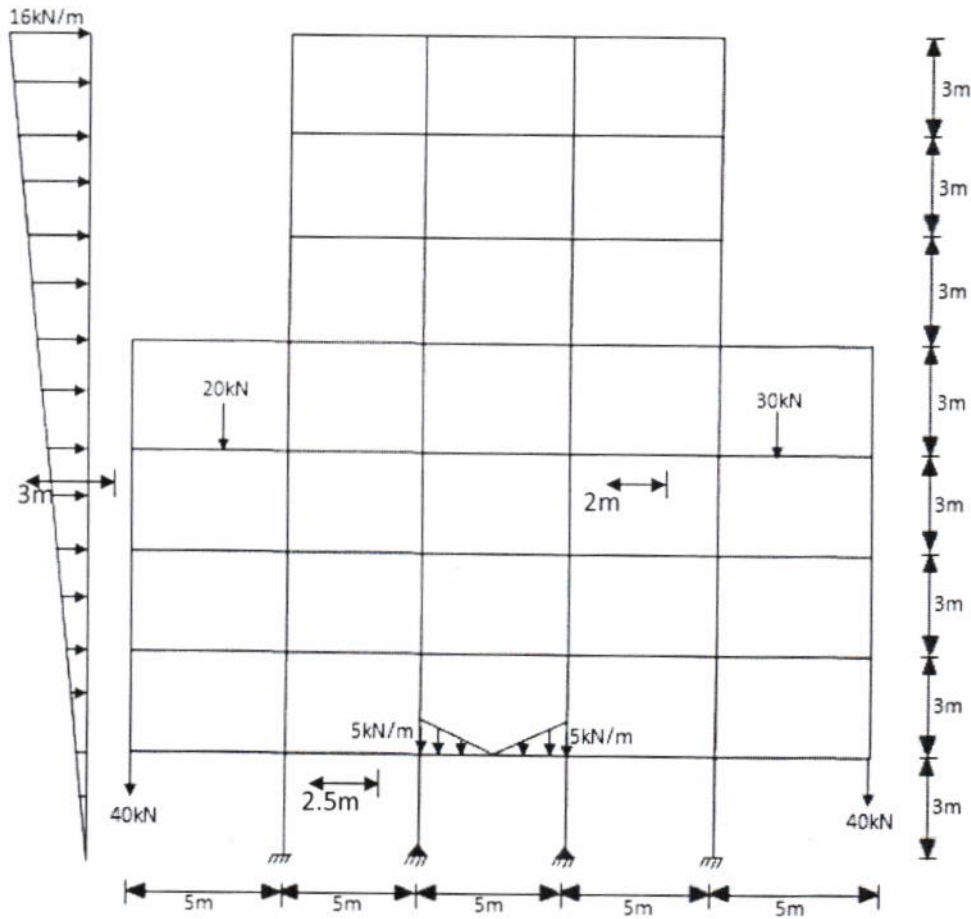
Part A: STAAD Pro and Auto Cad.

15 - 18

Q1: Using the concept of **auto-generation method** of STAAD Pro software, sketch and construct the idealization numbering of joints and members **concrete structure** shown below (All dimensions unit in meters). Edit the **analysis** commands of the structural members under the effects of following loading conditions:

- i. Self weight with Factor Safety (F.S.=1.4)
- ii. Roof super imposed dead load 4 kN/m with (F.S.=1.3)
- iii. Floor super imposed dead load 3 kN/m with (F.S.=1.2)
- iv. External loads (as shown below) with (F.S.=1.7)

Notes: $E_c = 3300 \text{ kip/in}^2$, column section (60 * 40 cm), beam size (T-section) [flange $b_f = 80\text{cm}$, $t_f = 20\text{cm}$], [web $H = 80\text{cm}$, $b_w = 30\text{cm}$].





University of Technology
Building and Construction Eng. Dept.
Final Exam 2013/2014

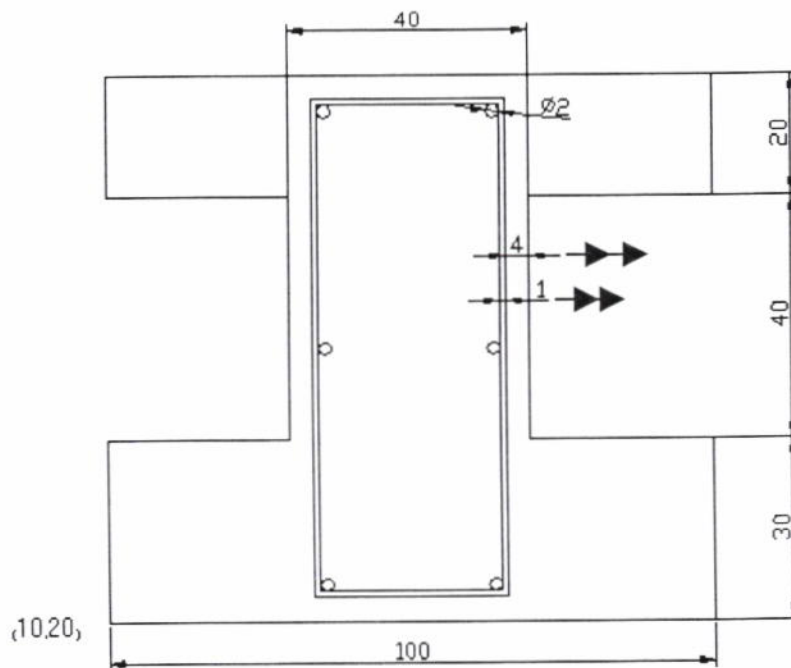
Subject: Computer Application
Branch: Water and Dams Eng.
Examiner: Assist. Prof. Dr. Mahmoud Saleh,

Class: 4th
Time: 1.5 Hour
Date : 2/6/2014



Q2: (Answer A or B)

A: Draw the following figure in board its' sides are (150×150 cm). If you know the figure is far away 10cm Horizontally and 20cm Vertically from original point(0,0). Concrete cover is equal to 4cm. Assume any dimension not found.





University of Technology
Building and Construction Eng. Dept.
Final Exam 2013/2014

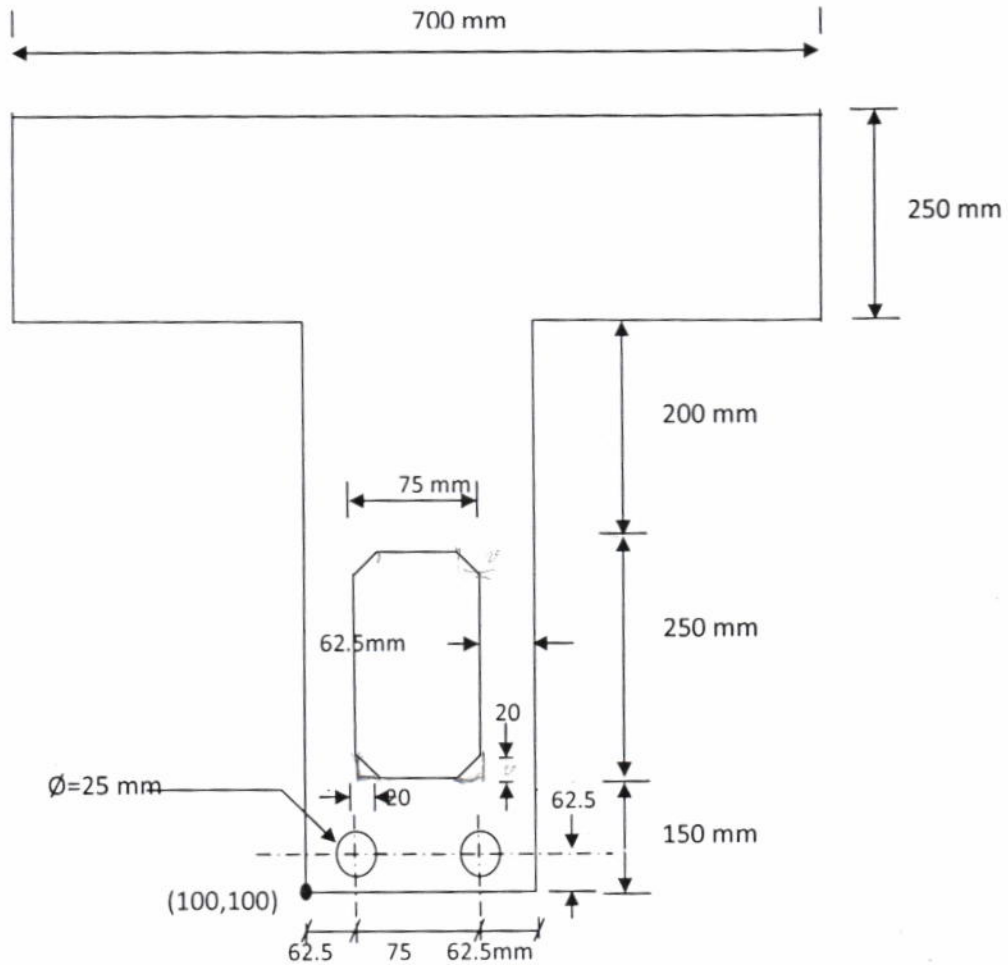


Subject: Computer Application
Branch: Water and Dams Eng.
Examiner: Assist. Prof. Dr. Mahmoud Saleh,

Class: 4th
Time: 1.5 Hour
Date : 2/6/2014

5-10

Q2:B: using AutoCAD program draw the following figure on board its sides(1000×1000mm) ,if you know the lower left side of figure is far 100 mm horizontally and 100 vertically, from original point.





University of Technology
Building and Construction Eng. Dept.
Final Exam 2013/2014

Subject: Computer Application
Branch: Water and Dams Eng.
Examiner: Assist. Prof. Dr. Mahmoud Saleh,

Class: 4th
Time: 1.5 Hour
Date : 2/6/2014



Part B: HEC-RAS.

Note: Answer only **four** questions.

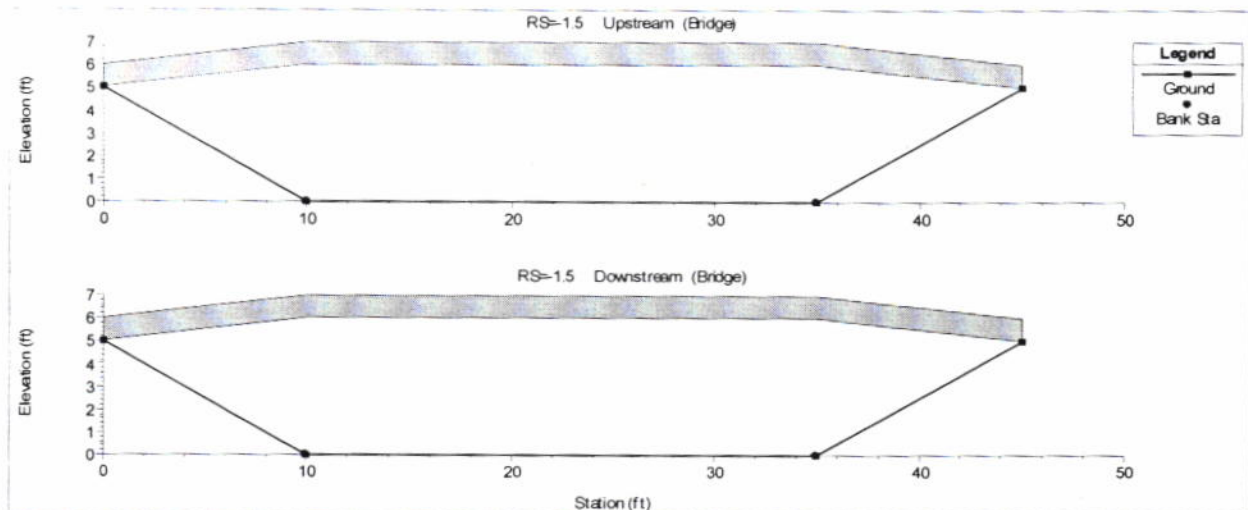
Q1:A: Explain (with necessary drawings and equations) the theoretical basis of the HEC-RAS for steady one - dimensional flow calculations.

Q1:B: What are the basic kinds of similarity? Give the main relations that explain each kind.

Q2: A: Fill the blanks in (1) and (2 or 3) of the followings:

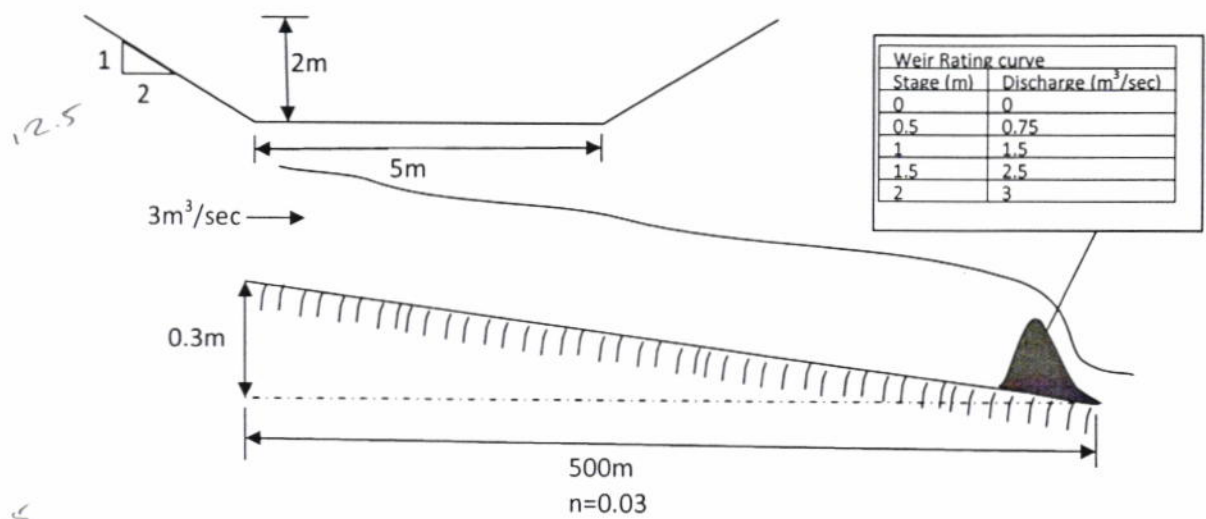
- 1- In HEC-RAS model the water surface profiles for the steady flow are computed by solving.....equation which is....., while for unsteady flow by solving.....equation which is..... andequation which is and theapproach is used to solve these equations.
- 2- Steady flow data that required to perform water surface profile consists of, and.....
- 3- The location of boundary conditions for subcritical flow is at....., while for supercritical flow is at..... and for mixed flow is at.....

Q2: B: Fill the bridge - deck/road way menu with the necessary data to represent the bridge deck shown below.



Q3: Draw a scheme representing the steps required for entering steady flow data and boundary conditions to simulate the flow in a river for three profiles with discharge 20, 40, and 60m³/sec. the corresponding boundary condition of these discharges is a known water surface elevation 1, 1.5, 2 m. a. m. s. l. (Draw the necessary main menu).

Q4: Explain, with necessary sketch, the main stapes for preparing and running a hydraulic model to simulate the flow in a trapezoidal channel of a cross section, longitudinal profile, flow data and boundary condition as shown below.



Q5: Write the geometric data of the hydraulic structure shown in figure (1) in the menus (A) and (B). The distance between upstream cross-section and deck is 25m, Deck width in direction of flow 10m, gate length 2m, gate width 3m, weir coefficient is 2.18, U.S and D.S embankment side slope is 0.5 and the weir is broad crested weir.

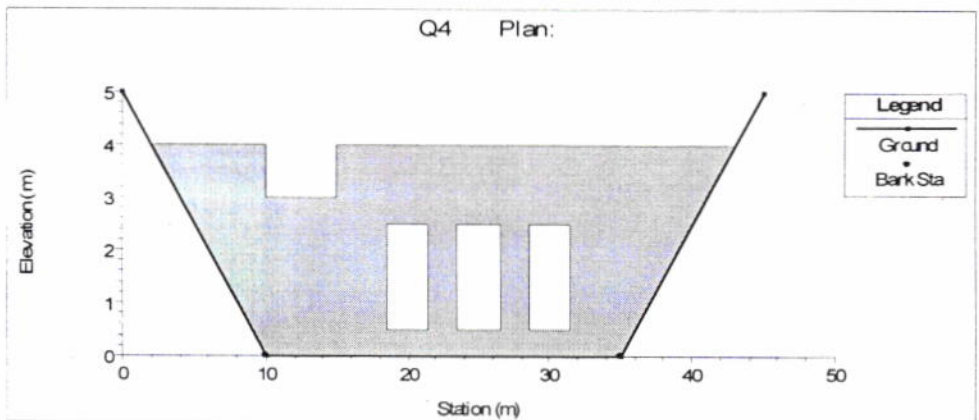


Figure (1): The Hydraulic structure



University of Technology
Building and Construction Eng. Dept.
Final Exam 2013/2014

Subject: Computer Application
Branch: Water and Dams Eng.
Examiner: Assist. Prof. Dr. Mahmoud Saleh,

Class: 4th
Time: 1.5 Hour
Date : 2/6/2014



Inline Structure Weir Station Elevation Editor

Distance	Width	Weir Coef

Clear Del Row Ins Row Filter...

Edit Station and Elevation coordinates

Station	Elevation
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

U.S Embankment SS D.S Embankment SS

Weir Data
Weir Crest Shape
 Broad Crested
 Ogee

Spillway Approach Height: []
Design Energy Head: [] Cd ...

OK Cancel

Menu A

Inline Gate Editor

Gate Group: Gate #1

Gate type (or methodology): Sluice

Geometric Properties

Height: []
Width: []
Invert: []
Openings: 0

Centreline Stations:

Station
1
2
3
4
5
6
7
8
9
10
11
12

Gate Flow

Sluice Gate Flow
Sluice Discharge Coefficient (0.5-0.7): []

Submerged Orifice Flow
Orifice Coefficient (typically 0.8): 0.8

Head Reference: Sill (Invert)

Weir Flow Over Gate Sill (gate out of water)
Weir Shape: Broad Crested

Weir Coefficient: 3

OK Cancel Help

Menu B

Good Luck