Mansoura University		Department: Building and Construction Engineering Total Marks: 50 Marks	Faculty of Engineering

Course Title: تحليل المنشآت بالحاسب الآلي Date: Jan. 04, 2018 (Self–Study)	Course Code: NSTE103 Allowed Time: 2 Hours	Year: Level 300 No. of pages: 2

Very Briefly

Question No. 1 (5 points): What is the difference between……?

1. Membrane and Plate in ETABS.
2. D+L±W and D+0.75(L±W).
3. P–δ and P–Δ effects?
4. Code and Spec.?
5. Line–Release and End–Release in SAFE?

Question No. 2 (5 points): What is…..?

1. STORY and BASE in ETABS?
2. DRIFT in ETABS?
3. Demand/Capacity Ratio in ETABS?
4. Singular stiffness matrix?
5. STIFF element in SAFE?

Question No. 3 (15 points): Complete the following:

1. In ETABS, Inclined line Object refers to …… .
2. Total displacement = constant displacement + …… displacement.
3. In ETABS and SAFE, Area Objects can be modeled using …… elements.
4. …… nodes have reactions .
5. The term …… in SLAB PROPERTIES in SAFE refer to all area objects?
6. Volumes can be modeled in ETABS and SAFE using …… objects.
7. A DIAPHRAGM can be …… or semi-rigid.
8. Soil type A refers to ……
9. ΔM = …… × R × ΔS.
10. LINK BEAMS can be labeled as Spandrels to get results …… and …… .
11. In 2D, there are …… degrees of freedom.
12. For Rigid Bodies, you have …… deformations.
13. In ETABS, Large Objects can be meshed into …… Objects using EDIT MENU.
14. The Finite Element Method FEM is a …… method.
15. The DIAPHRAGM ……–plane stiffness is larger than its ……–plane stiffness.

Question No. 4 (10 points): True or False?

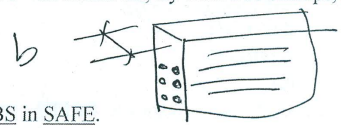
1. In ETABS and SAFE, Objects mean Geometry.
2. In ETABS and SAFE, ELEMENTS refer to MESHING.
3. The RESPONSE MODIFICATION FACTOR R = 8.5 for Frames.
4. COLUMNS and SHEAR WALLS as vertical elements can be designed using ETABS Program.
5. It is possible to model EXPANSION JOINTS or CUTS in SAFE.
6. In ETABS, Vertical Area Objects refer to Floor Slabs.
7. Vertical Parts of Shear Walls can be labeled as PIERS to get results Left and Right .
8. K for Rigid Springs equals zero.
9. In ETABS, COLUMNS and WALLS must be Hinged with the base.
10. In ETABS, Large Objects can be divided into Small Objects using ASSIGN MENU.

Question No. 5 (5 points): WHY?

1. STIFF elements are introduced in SAFE?
2. Checking DEFLECTIONS, CRACKING, VIBRATIONS, TILT, ETC. at service level?
3. DIAPHRAGMS are introduced in ETABS?
4. AVERAGING AT PEAKS is introduced in SAFE?
5. AUTO–LINE CONSTRAINTS option is introduced in ETABS?

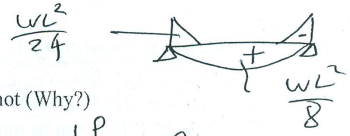
Question No. 6 (15points):

1. For the shown WALL, if the SHEAR REINFORCEMENT = 2000mm²/m, try ……Φ10 stirrups, 2–legs.

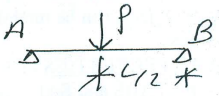


2. Show How you could model each of the following SLABS in SAFE.

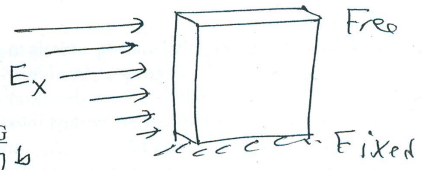
3. Why does the Egyptian Code require to draw the BMD for a Simple Beam as shown? Show how you could satisfy this solution in ETABS and SAFE.



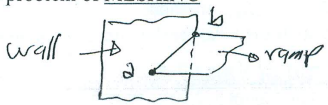
4. Is it okay to RELEASE ϕx at **A** and **B** simultaneously. If not (Why?) show how you could overcome this problem?



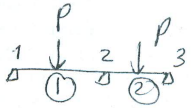
5. For the shown planar SHEAR WALL along with the in–plane SEISMIC LOADS, it is required to:
   a. Specify the appropriate type of ANALYSIS.
   b. Specify the appropriate ELEMENT type.
   c. What are the degrees of freedom per node.



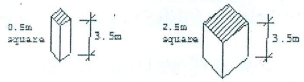
6. Show How you could overcome the problem of MESHING along the line **a–b** in ETABS.



7. Write the **P = K Δ** for Elements 1 and 2 and the whole BEAM.



8. Show How you could model each of the following columns in ETABS.



Best Wishes
Associate Prof. Dr. Mohamed El-Zoughiby