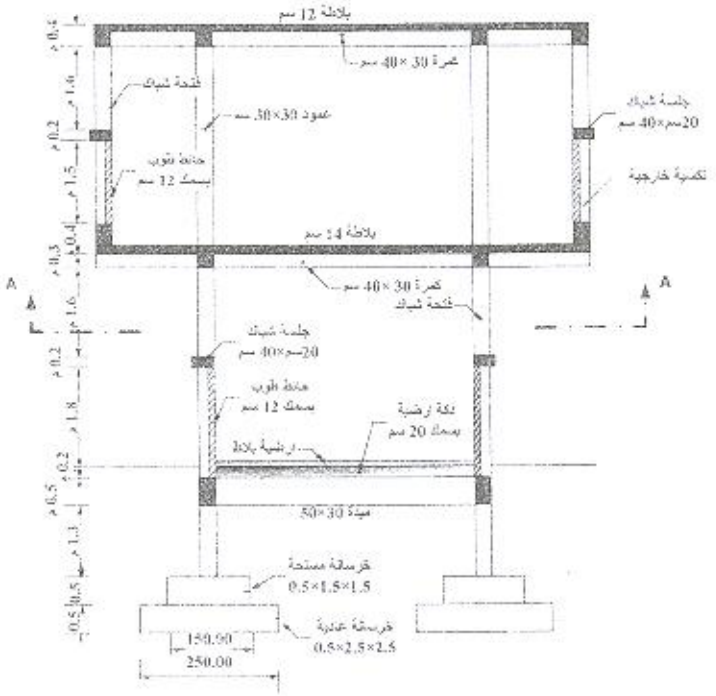
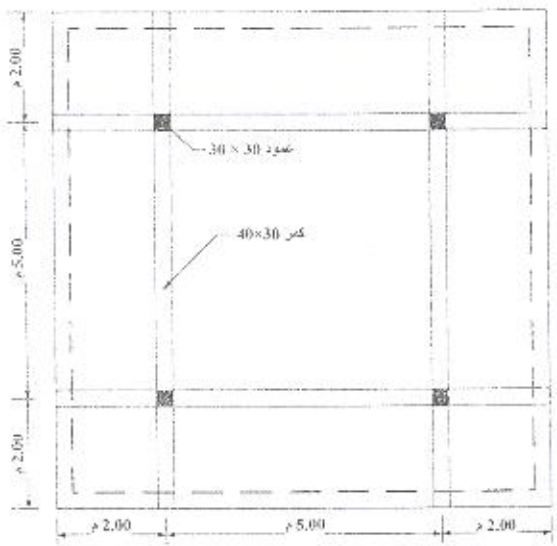
السؤال الثانى (٣٠ درجة)

أ- بوصفك مهندس الاستشارى بالموقع, أحسب الكميات الآتية لتنفيذ غرفة أمن على بوابة أحدى القرى السياحية علما بأن الشكل التالى يوضح قطاع افقى لسقف الغرفة بالاضافة الى قطاع راسى

i. الحفر (قواعد – سملات)
ii. الخرسانة العادية (قواعد خ ع – دكة ارضية – جرسانة الميول للسطح بسمك ٧ سم)
iii. الخرسانة المسلحة (قواعد خ م – سملات – عمدان – كمرات – بلاطات)
iv. حديد التسليح للقواعد علما بان حديد تسليح القواعد ٥ ⌀ ١٢ فى الاتجاهين
v. اعمال عزل القواعد فقط لقصة الردم

ب- اعداد المقايسة التثمينية الازمة لتنفيذ ماتم حصرة من اعمال
(صمم جدول المقايسة – اقترح صياغة البنود – وضح الكميات للبنود المقترحة بوحدتها فى الجدول)





Section A-A

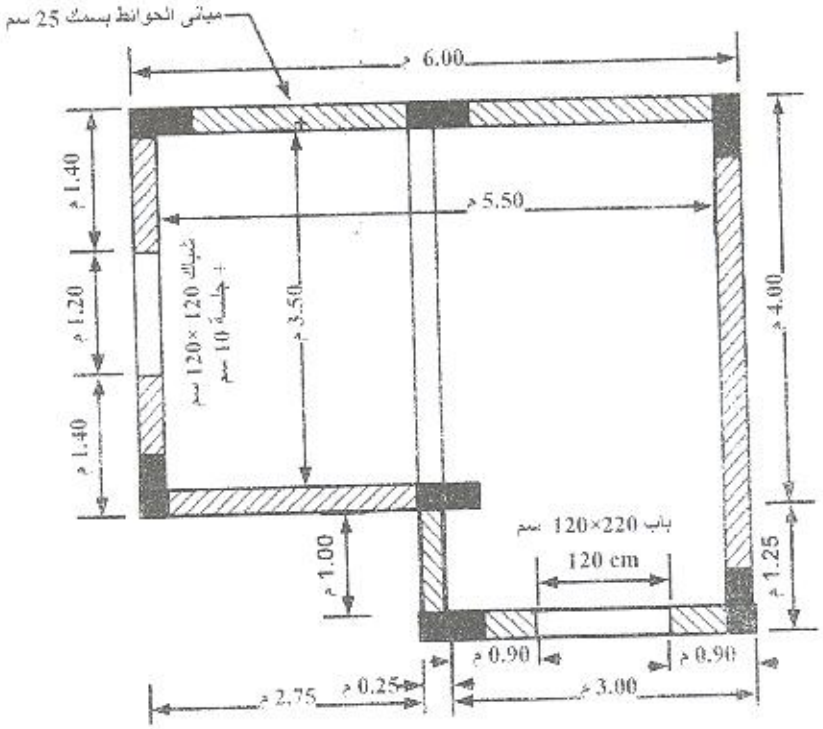
السؤال الثالث:(٢٠ درجة)

أ- ضع علامة (√) امام العبارات الصحيحة وعلامة (×) امام العبارات الخاطئة:

١. تعتبر ترابيع الخرسانة للممرات من اعمال الخرسانة العادية
٢. قد تقاس اعمال الخرسانة المسلحة لاى سمك بالمتر المربع فى حالة عمل بند موحد للبلاطات مع الكمرات
٣. لا يمكن عمل بند منفصل لحديد التسليح فى مقايسات اعمال الترميم
٤. تصنيف مشروعات التشييد طبقا لنوعية الاعمال الى مشروعات المبانى و مشروعات الهندسة المدنية.
٥. من انواع المقايسات التثمنية مقايسة كمية و مقايسة فعلية
٦. مساحة الحفر = الطول الكلى × عرض الكلى للمنشاء من الرسومات.
٧. الاعتاب من اعمال الخرسانة المسلحة
٨. يقاس العمود فى الدور الارضي من منسوب ظهر القاعدة حتى منسوب بطنية البلاطة فى حالة عدم وجود رقبة عمود
٩. تكتب صياغة بنود الخرسانة العادية فى المقايسة التثمنية
١٠. يمكن جمع اعمال البلاطات و الكمرات للدور فى بند واحد

ب- الشكل التالى يبين المسقط الانشائى لغرفة تم بنائها حديثا أعلى عقار. اذاكان ارتفاع الدور الصافى ٣،٠٠ م ، قطاعات جميع الكمرات ٢٥×٥٠ سم و قطاعات جميع الاعمدة ٢٥×٦٠ سم سمك البلاطة ١٠ سم.
احسب :

i. كمية المبانى الازمة لعمل الحوائط الخارجية للغرفة
ii. اعمال البياض الداخلى فقط (بياض المحارة - الدهان)



السؤال الرابع:(١٥ درجة)

أ- اختار الاجابة الصحيحة

١. الموصفات الفنية هى الجزء الذى
   a) يحدد العلاقة التعاقدية و طريقة سداد الدفعات
   b) يختص بحساب كميات المواد المستخدمة
   c) يختص بشرح المواد الخام و المواد الصنعة المستخدمة

٢. فى حالة تعارض الملاحظات الواردة بالرسومات مع الموصفات يتم الاخذ
   a) بالملاحظات بالرسومات
   b) بالموصفات
   c) برأى المهندس الاستشارى

٣. تتطلب مصلحة المالك لضمان حقوقة ان تحتوى الموصفات على
   a) شروط قاسية على المقاول
   b) شروط متوازنة
   c) شروط متساهلة لضمان عدم اعاقة العمل

٤. فى حالة استخدام المقاسات او الاشكال الغير قياسية للاقطار
   a) ينعكس ذلك على التكاليف النهائية للمشروع
   b) لا علاقة لة بتكلفة المشروع
   c) يمكن للمقاول استبدالها بقطاعات اخرى قياسية دون الرجوع للمهندس

٥. يجب عدم وصف كلا من طريقة التنفيذ و النتائج المطلوبة بالموصفات الفنية
   a) لعدم الاطالة
   b) لكى لا يشترك المالك فى تحمل المسولية عن النتائج
   c) لكى يشترك المالك فى تحمل المسولية عن النتائج

ب- ضع علامة (√) امام العبارات الصحيحة و علامة (×) امام العبارات الخاطئة:

١. تتسبب الموصفات الفنية المعدة جيدا فى خفض تكاليف المشروع النهائية على المالك
٢. يتم اضافة عبارة (من احسن صنف) لبنود المواد الخام لضمان جودتها
٣. يستخدم اكثر من مرادف فى الموصفات لتاكيد المعنى
٤. يفضل استخدام المقاسات و الاقطار القياسية للمواد
٥. كلما ذادت اهمية المشروع كلما اذداد التدقيق فى الموصفات و المعلومات الواردة بها
٦. يمكن استخدام موصفات مشروع معدة مسبقا فى اى مشروع متشابة معة
٧. الموصفات و الرسومات يكمل كل منهما الاخر
٨. يتم استخدام الضمائر فى كتابة الموصفات للاختصار
٩. فى حالة قيام المالك بعمل الجسات فمن الطبيعى ان يسلمها للمقاول مع تخلية عن مسولية دقة المعلومات الواردة بها
١٠. من غير المفضل استخدام صيغة فعل الامر بالموصفات الفنية و يستخدم بدلا منها فعل التفضيل

مع اطيب الامانى بالتوفيق

د نشوى يوسف و لجنة الممتحنين:

Dept.: Structural Engrg.	Faculty: Engineering	University : Tanta
Time allowed: ٣ hr. Date: January 2011	Course: Design of steel structures (a)	Course code: CSE3124

Note:

- It is allowed to use any tables or Egyptian Code of Practice books.
- Any missing data may be reasonably assumed.
- Attempt all questions. Max. Credit 100 % only.
- Number of examination pages: (4).

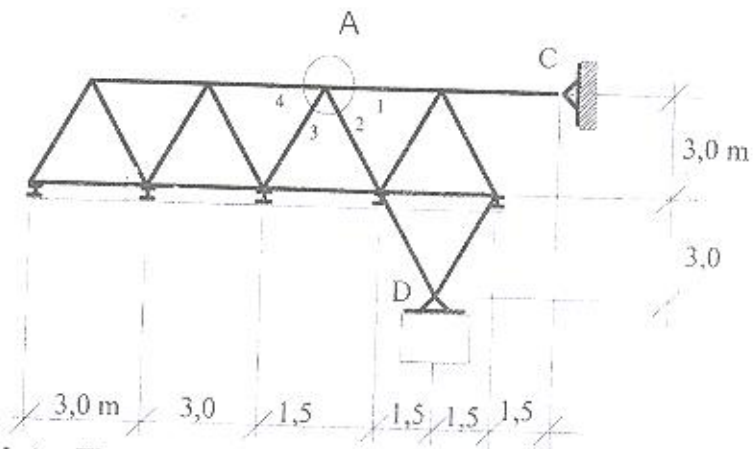
Question 1:

(25 %)

The steel skeleton of a vehicles-shed is built up of trusses type shown below. The system shown is **two-hinged truss** at points C and D.
Given the following data, answer the required questions.

Data:

- Spacing between trusses = 4.0 m
- Own weight of steel structure = 30 kg/m² of covered area.
- Live load = 60 kg/m²
- Weight of cover = 20 kg/m²
- **Neglect the effect of wind pressure.**
- Use steel grade **St37**.



Note: The cover is fixed at the bottom chord

Required:

1) Draw to sketch different views showing the arrangements of bracing system. The length of the covered area is 20.0 m. (10%)
2) Calculate the design forces in marked members at joint A. (5%)
3) Design an intermediate purlin as rolled steel section. (10%)

TANTA UNIVERSITY
FACULTY OF ENGINEERING
DEPARTMENT OF STRUCTURAL ENGINEERING
EXAMINATION (THIRD YEAR) STUDENTS OF STRUCTURAL ENGINEERING هـ إنشائية-لائحةجديدة

COURSE TITLE: DESIGN of REINFORCED CONCRETE STRUCTURES (2) a			COURSE CODE: CSE3123
DATE: January - 2011	TERM: FIRST	TOTAL ASSESSMENT MARKS: 75	TIME ALLOWED: 4 hours

Systematic arrangement of calculations and clear neat drawings are essential. Any missing data can be reasonably assumed. The exam consists of FIVE questions in two pages.

Problem # One (17Marks)

TRY ALL PROBLEMS

a. Proof the code equation $q_{tu} = M_{tu}/2Ao \times te$ for the nominal ultimate torsional shear stress. What is the meaning of the terms "Equivalent thin-walled tube" in torsional analysis? (3Marks)

b. Compare between shear and torsion with regard to: stress distribution, mode of failure, code requirements. (3Marks)

c. Draw the B.M.D, S.F.D and T.M.D for the beams shown in Fig.(1-a) under the given loads. (4Marks)

d. Check design the section shown in Fig. (1-b) subjected to the following actions: $M_u = 400$kN.m, $Q_u = 400$kN, $M_{tu} = 150$kN.m.
Materials: $f_{cu} = 40$MPa, $f_y = 400$MPa. (7Marks)

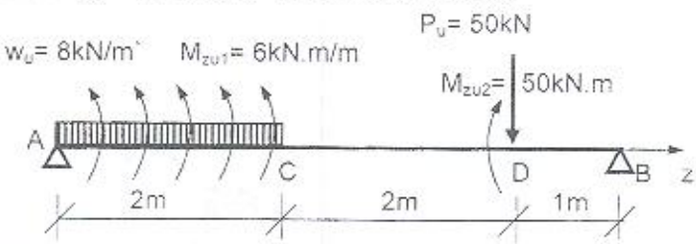


Fig. 1-a

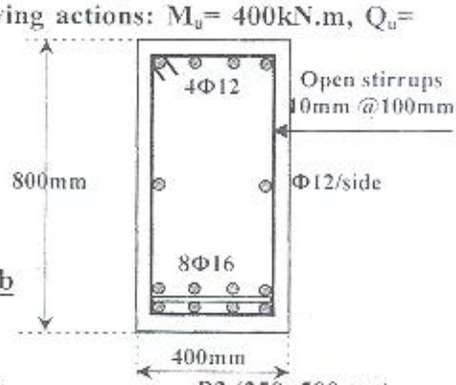


Fig. 1-b

Problem # Two (6Marks)

Fig. 2 shows layout of a first floor resting on eight columns with area of 8×9.6m. The panelled beams system is required to cover the floor using the beam modules shown in figure. The slab is subjected to L.L= 5kN/m^2 and cover= 1.5kN/m^2. The slab thickness is 100mm. It is required to make a complete design (design + drawing details) of the panelled beam By1 only.
Materials: $f_{cu} = 25$MPa, $f_y = 360$MPa

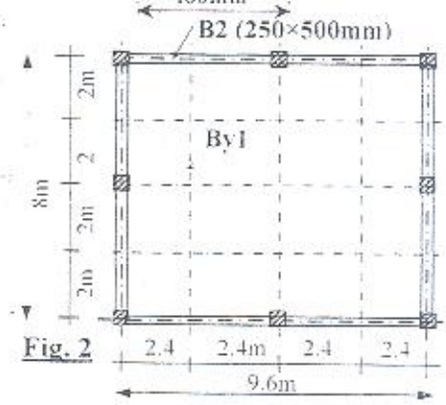


Fig. 2

Problem # Three (24Marks)

a. Explain the concept of using the hollow-block slab systems? (3Marks)

b. Compare between the solid slabs, hollow block slabs, waffle slabs and flat slabs, with regard to: load transfer, economy and advantages. (3Marks)

c. Fig. 3 shows a structural plan of roof ABCD. The roof is resting on the beams (AD and EF) and on the frames (EB and FC). The slab AEFD is dropped 100mm. The hollow-block slab system is required. The slabs is subjected to a live load = 6kN/m^2 and a flooring cover= 1.8kN/m^2. The cross section of all beams is 250×600mm. Materials: $f_{cu} = 40$MPa, $f_y = 400$MPa. It is required to carry out the following:
   i- Draw the B.M.D and S.F.D of critical strips. (5Marks)
   ii- Design the slabs at critical sections. Compute the width of the solid parts due to the S.F and B.M. (6Marks)
   iii- Draw on plan the reinforcement details and the arrangement of hollow blocks. (4Marks)
   iv- Compute the load acting on the supporting beam EF. (3Marks)

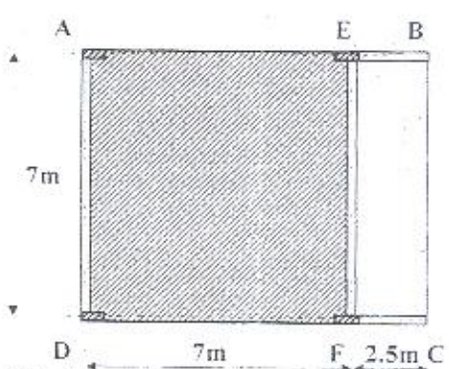


Fig. 3

P.T.O

Problem # Four (22Marks)

(A) Fig. (4-a) shows part of a plan of a typical floor of RC flat slab 36 × 40m consists of 25 panels each side 5 panels 7.2×8m each panel and slab thickness 0.25m (t_s= 250mm) without drop panel and with column head 1.50m×1.50m. The flat slab is resting on square columns 0.5mx0.5m. The marginal beams 0.3mx0.9m are used at the outer edges of the flat slab. The flat slab is subjected to a uniformly ultimate (factorized) load, Wu= 20kN/m^2. Materials: f_{cu}= 25MPa, f_y= 360MPa
Using the empirical method of the Egyptian code of practice ECP203-2007 for design of flat slab, it is required to carry out the following:

i- Determine the critical bending moment in column and field strips in long direction only. (4Marks)

ii- Design the critical sections due to bending moment in column strip and field strips for the intermediate panel C1 C2 C3 C4 only. (5Marks)

iii- Check one-way and two-way shear stresses for the interior column C1 considering the case of the total load only. (4Marks)

iv- Draw on plan the reinforcement details of the column and field strips in the intermediate panel C1 C2 C3 C4 only. (4Marks)

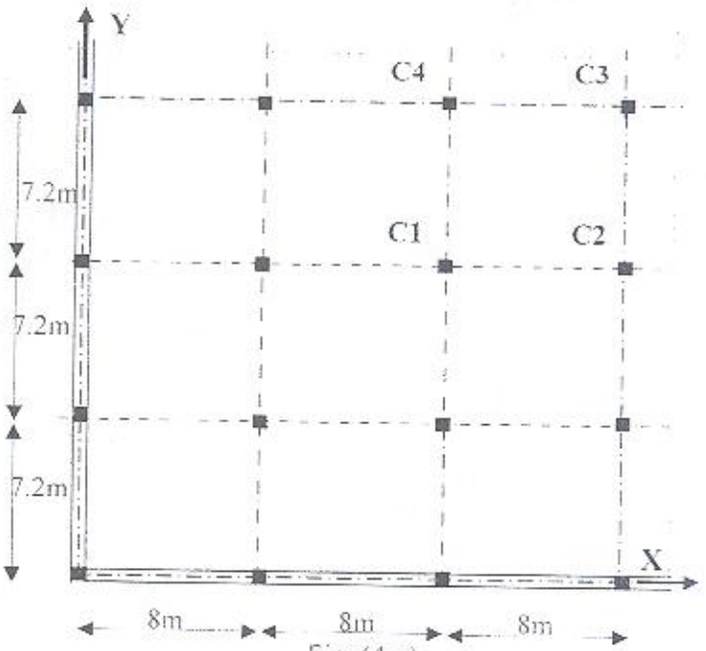


Fig. (4-a)

(B) What will be the punching shear stresses if a large opening exists at a distance 0.4m from the edge of column head of the interior column C1 in the previous problem, as shown in Fig. (4-b), and considering the case of total load only? And what will be the moment transfer from the flat slab to the internal column C1 in this case? (5Marks)

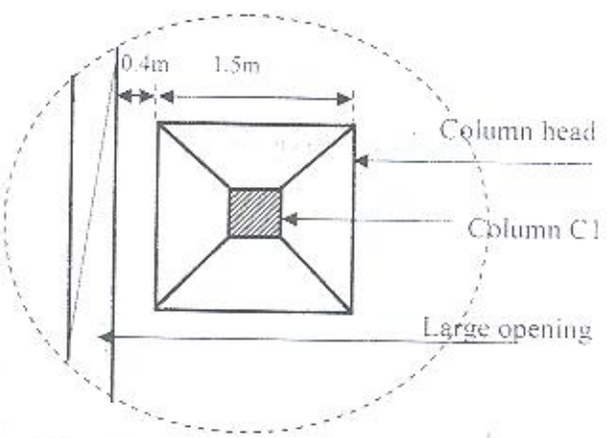


Fig. (4-b). Internal column C1 with large opening at 0.4m from the edge of the column head

Problem # Five (12Marks)

a. Fig. 5 shows the expected cracks (1 to 14) on a beams and a cantilever under a different case of loadings. What are the reasons of occurrence the cracks shown? How the Egyptian Code equations resisting the cracks shown in case 6 of a corbel? What are the precautions of the reinforcement details of the corbels? (8Marks)

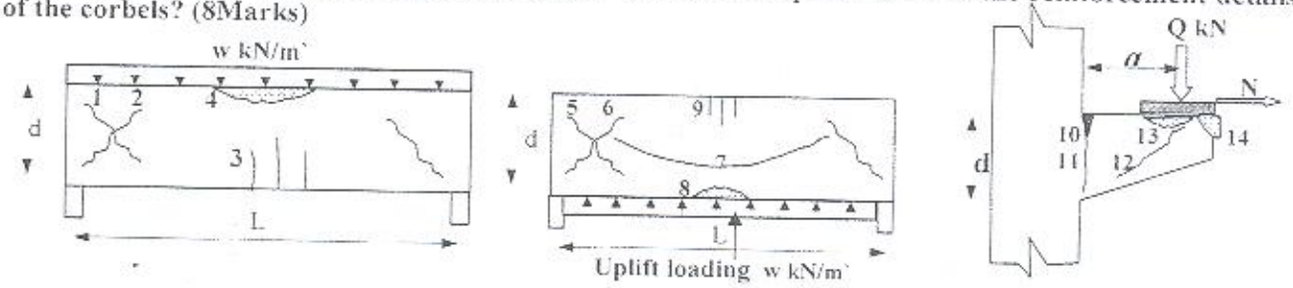


Fig. 5 Case 1: L/d= 5 Case 2: L/d= 1.5 Case 3: L/d= 5 Case 4: L/d= 1.5 Case 5: a/d = 3 Case 6: a/d = 0.5

b. Compare between shallow and deep beams with regard to: strain distribution – limits according to the following codes: ACI (318-2005), ECP-203 2007, Canadian, Euro Code2, BS 8110 (97). What is your opinion about the transition zone from shallow to deep beams? (4Marks)

All the Best

Prof. Dr. Mohamed Kasem Prof. Dr. Tarek El-Shafiey

ثانية ٢٠١٦/١١/١٨

Tanta University

Department: Structural Engineering
Total Marks: 85 Marks

Faculty of Engineering

Course Title: Structure Analysis (3) (أ) Course Code: CSE3122 Year: Third Year (هندسة إنشائية – لائحة جديدة)
Date: January, 2011 (First term) Allowed time: 3 hrs No. of Pages: (2)

Remarks: (**a** .answer the following questions. - **b.** assume any missing data.)

1- Problem (1) 15 Marks:

Using the force method, draw the B.M.D. for the given frame of constant I shown in **Fig. (1)**.

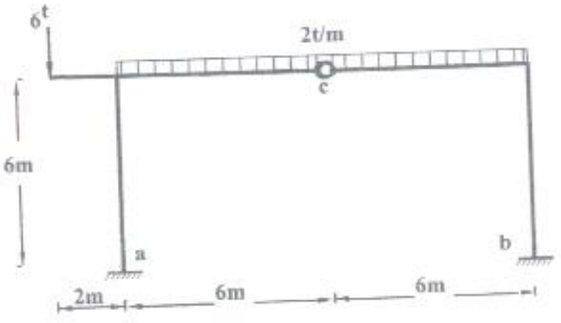


Fig. 1

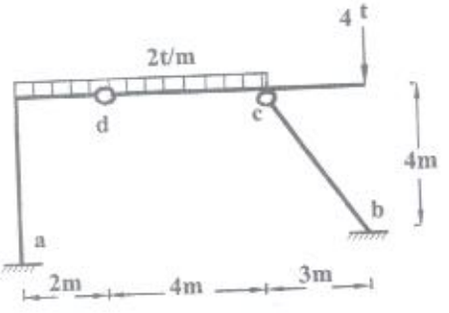


Fig. 2

2- Problem (2) 15 Marks:

Using the force method, draw the B.M.D. for the given frame of constant I shown in **Fig. (2)**.

3- Problem (3) 20 Marks:

Using the force method, draw the B.M.D. for the given frame of constant I which hinged at **a** and roller at **b** shown in **Fig. (3)**.

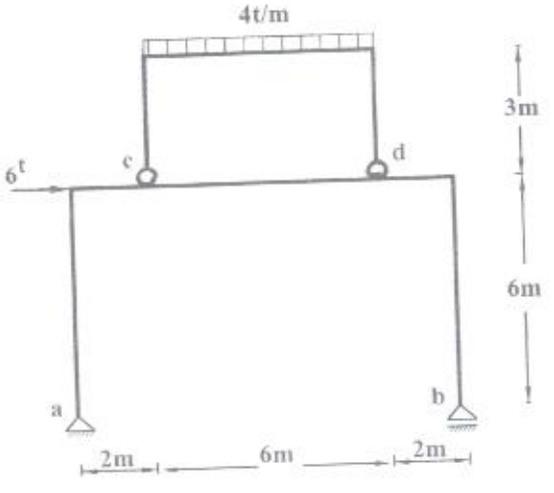


Fig. 3

P.T.O.

4- Problem (4) 15 Marks:

Using the slope-deflection method, draw the B.M.D. for the given frame of variable I shown in **Fig.(4)**.

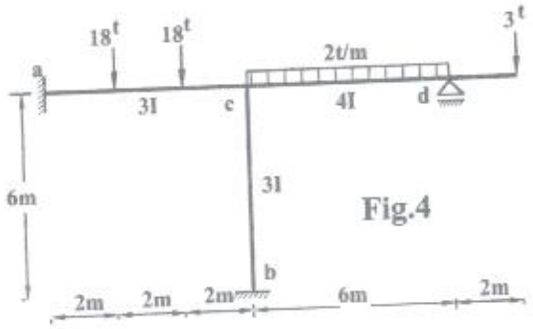


Fig.4

5- Problem (5) 15 Marks:

Using the slope-deflection method, draw the B.M.D. for the given frame of constant I shown in **Fig.(5)**.

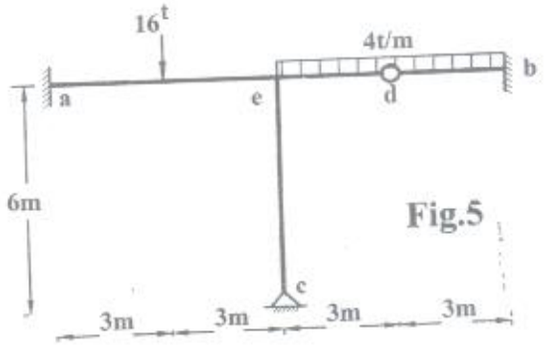


Fig.5

6- Problem (6) 15 Marks:

Using the moment distribution method, draw the B.M.D. for the given frame of variable I shown in **Fig. (6)**.

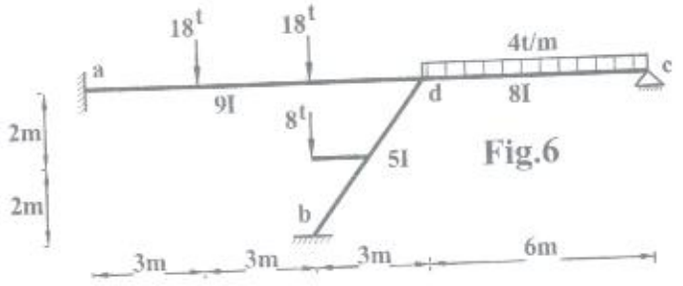


Fig.6

With the best wishes

Course Examination Committee

Prof. Dr. Mohamed A. Kasem & Assist. Prof. Tarek Mohamady Khalifa

Question 2:

(30 %)

Table (1) shows data given for truss members. By Using **St. 52**:

a- It is required to design these separate members (consider their connections as welded ones).

b- Calculate the required welded lengths.

Table (1)

Member	F_u [t]	L [m]	L_{bx} [m]	L_{by} [m]	Type
1	+20	5	-	-	Top chord
2	-15	5	5	2.5	Top chord, Unequal angles
3	+30	4	-	-	Bottom chord
4	0	6	-	-	Diagonal member
5	±12	4	4	4	Bottom chord

Question 3:

(12 %)

Fig. (2) shows the statical system of a part of an industrial building. According to the Egyptian Code of Practice, compute the effective buckling lengths for columns 1-2, 2-3, 4-5, 6-7 and 7-8.

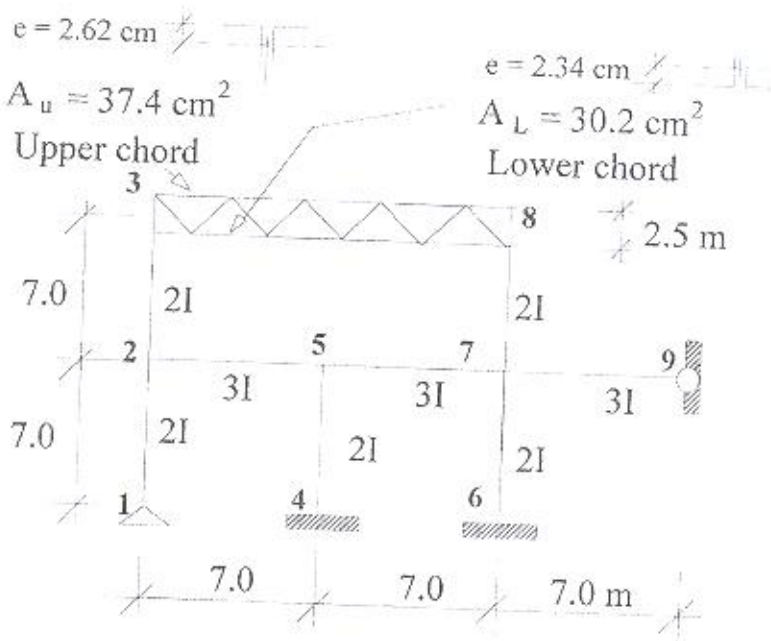


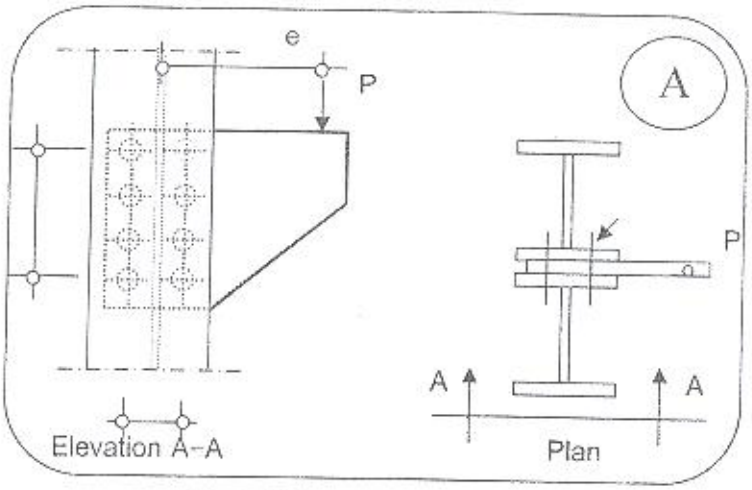
Fig. (٢)

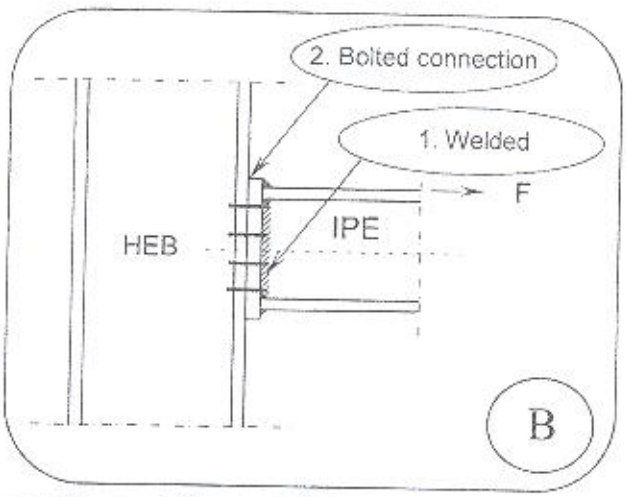
$I = 4000\ cm^4$

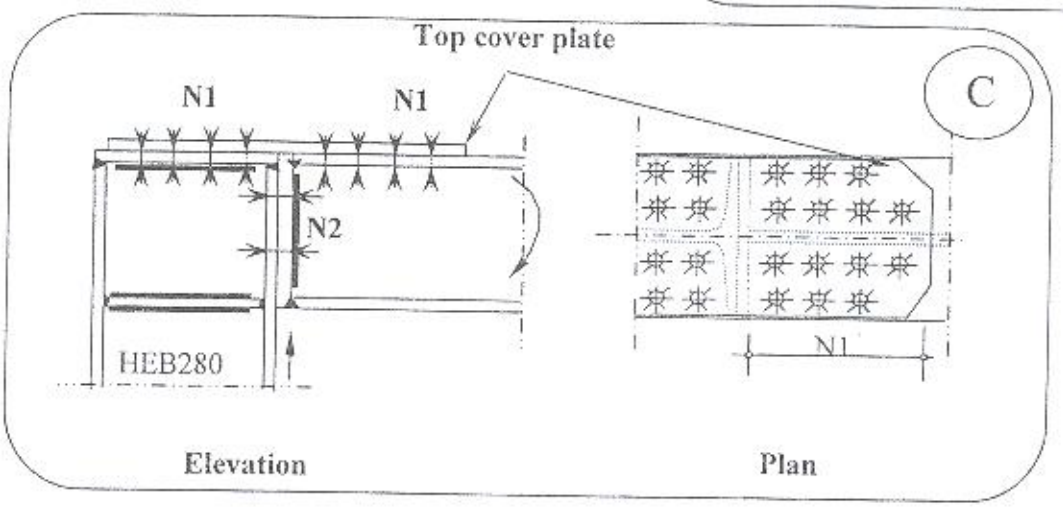
Question 4:

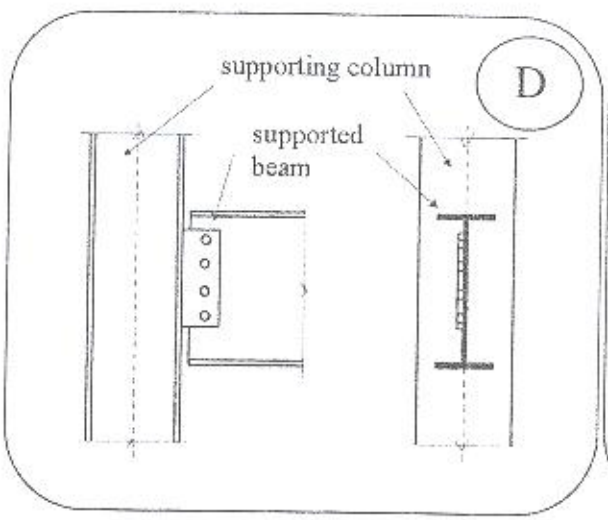
(25 %)

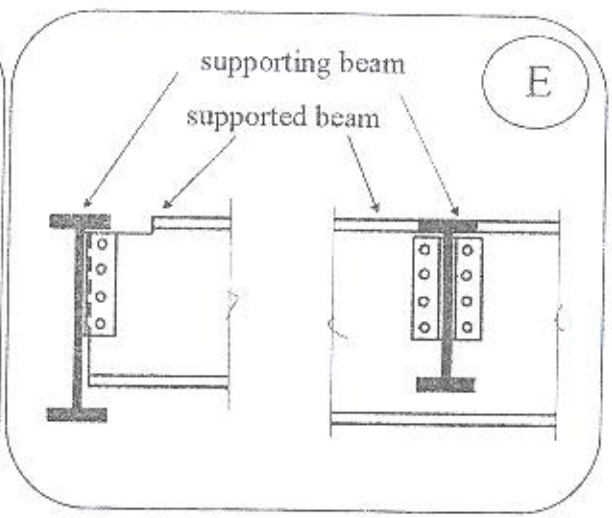
Describe, **with net sketches and without any calculations**, the straining action of the following steel connections at Figures A, B, C, D and E:











Question 5: (20 %)

It is required to examine the following statements by choosing (√) or (×), ***giving the reason for each choice***.

1. The theoretical value of the factor (G) for the *fixed support* is 0.0, while its practical value in design equals to 1.0.
2. The effective buckling length factor (K) for columns in *sidesway prevented* rigid frames is always greater than 1.0.
3. Among the SIB, IPE and HEB, the best suitable cross-section to be used with columns and as beams subjected to double bending moments is the *SIB*.
4. Using LRFD method, the strength is considered to equal the nominal or theoretical strength of the member multiplied by a resistance factor, which is nominally *less* than unity.
5. The vertical and horizontal loads in the plane of the main system are carried by the *bracing systems*, while the lateral loads are carried by the *main system*.
6. A tension member with holes can possibly fail by *yielding* at the net section through holes.
7. For a *diagonal* zero member with a length of 3ms with a bolted connection (ϕ =16mm), the best design cross-section is one angle $75\times75\times8$.
8. The *unfactored yielding* strength of the tension member which composed of two back-to-back angles $100\times100\times10$, given that the steel is St44, is 107.52t.
9. The *minimum angle leg* that can be connected using the bolt M24 is $60\times60\times6$.
10. The maximum slenderness ratio (λ_{max}) for a *long* compression member made of St 37 which has a critical buckling stress (F_{cr}) of 0.497t/cm2 is 143.95.

Best wishes, Prof. Dr. Mohamed Dabaon and Exam. Committee

Tanta University

Department: Structural Engineering
Total Marks: 75 Marks

Faculty of Engineering

Course Title: Soil Mechanics (3)	Course Code: CSE3125	Year: 3rd Structural Eng.
Date: 23 January 2011 (First term)	Allowed time: 3 hrs	No. of Pages: (4)

- Assume any missing data
- Answers should be supported by sketches

Question Number (1) ***(15 Marks)***

a) What is the main goal of soil exploration? (3 Marks)

b) What are the different steps of a soil exploration program. (3 Marks)

c) What are the methods adopted for measuring the field density of soil. (4 Marks)

d) Discuss with clear sketches the penetration testing of the soil in the field, what are the applications of such tests in engineering practice. (5 Marks)

Question Number (2) ***(15 Marks)***

a) What are the main differences between consolidation and compaction of soil? (1 Marks)

b) State the main differences between the standard and the modified proctor tests. (1 Marks)

c) Summarize with clear sketches some of the geotechnical applications in which the surface compaction can be used. (2 marks)

d) Describe briefly using clear sketches how to assess the maximum dry density of compacted sand in the field using the sand cone device. (2 Marks)

e) The following results were obtained from a Proctor test: (6 Marks)

We %	4	5	6	8	10	12
γ t/m^3	1.77	1.79	1.88	1.95	1.91	1.85

It is required to:

- Plot the moisture-dry density curve, and then determine the optimum moisture content "O.M.C" if the specific gravity of the tested soil equals 2.65.
- Comment on the curve behaviour using the interpretation of the compaction theory.
- On the same axes, plot the curves of 80% and 90% degrees of saturation.

f) For the previous problem predict the expected field density of a sub-base layer of the same soil if the supplied field water content is 18% and the required compaction efficiency must not be less than 96%. (3 Marks)

Question Number (3) ***(15 Marks)***

a) The following Figure (1) shows two cases of retaining walls that are retaining approach fill of a bridge. The approach fill is sand with $\gamma = 2.0$ t/m^3 and ϕ' of 33°. Calculate the earth pressures distributions on vertical line AB in cases 1 and 2. (5 Marks)

P.T.O.

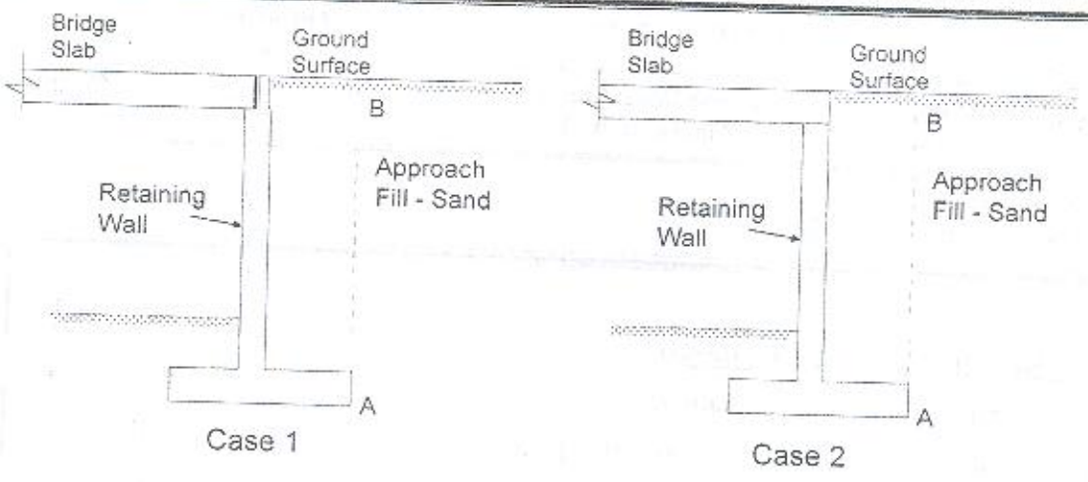


Figure (1)

b) For the given retaining wall channel (Figure 1), **calculate**: (10 Marks)

(I) Factor of Safety against sliding in case of the channel is empty (4 Marks)
(II) Factor of safety against overturning in case the channel is full of water (4 Marks)
(III) The stress under the base in case the channel is full of water. (2 Marks)

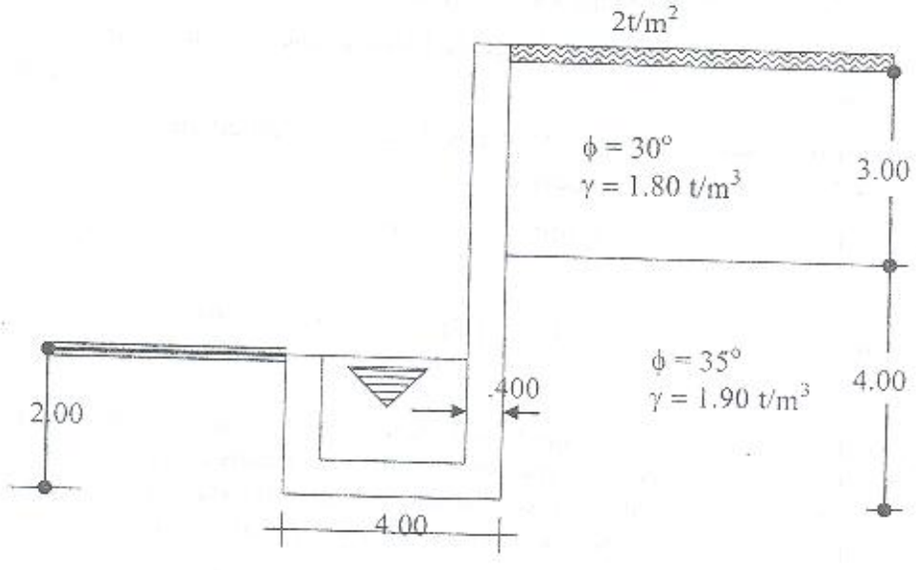


Figure (2)

Question Number (4) ***(15 Marks)***

a) An infinite slope exists at an angle "β" to the horizontal in a clay soil having a unit weight "γ" and effective strength parameters "c' " and "φ' ". Derive an expression for the factor of safety against failure along a shallow slip plane parallel to the ground surface. (3 Marks)

b) Re-derive the previous expression for the case if a ground water surface exists at the slope surface.
(3 Marks)

c) Use the expression derived in (a) to find the maximum stable slope where $c' = 0$, $\varphi' = 20°$ and $\gamma = 19$ kN/m^3.
(2 Marks)

d) The factor of safety of the clay cutting shown in Figure (3) is considered inadequate. Hence, in order to increase it, the cross section is to be altered by removing part of the soil as shown. Determine the percentage increase in the factor of safety. (Neglect the tension crack zone).
(5 Marks)

e) If the slope described in (d) is still unsafe, show, using clear sketches, how to protect this slope against failure.
(2 Marks)

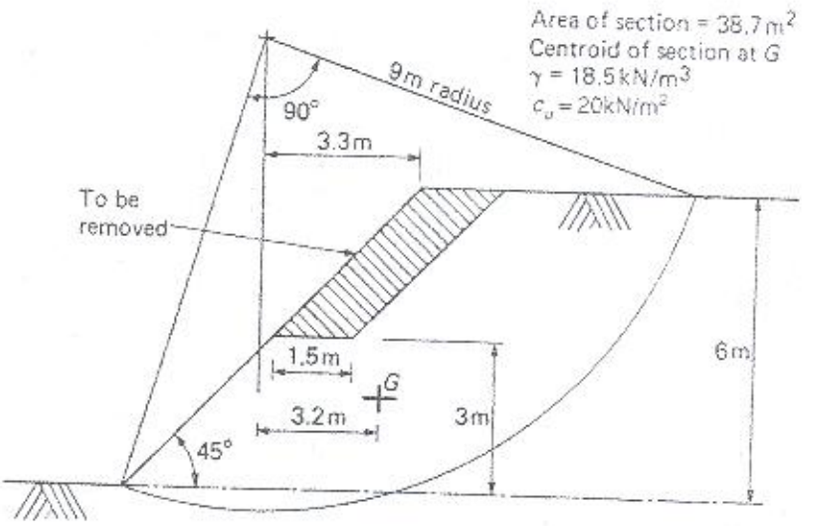


Figure (3)

Question Number (5) ***(15 Marks)***

a) Explain the effect of the ground water table on bearing capacity of soil in cases of
(i) sand (ii) clay
(3 Marks)

b) Explain using sketches the concept of floating foundations
(3 Marks)

c) Consider the site shown in Figure (4). The soil in the site is characterized as sand with unit weight of 18 kN/m^3. The groundwater level is at 1.5 m below ground surface. A footing load test is carried out on Footing A (1mx1m) at the ground surface. Based on the test, the ultimate load on Footing A is 290 kN. Calculate the maximum allowable load (P) in kN on Footing B (2.5mx2.5m) in the same site using factor of safety of 3.
(9 Marks)

P.T.O.

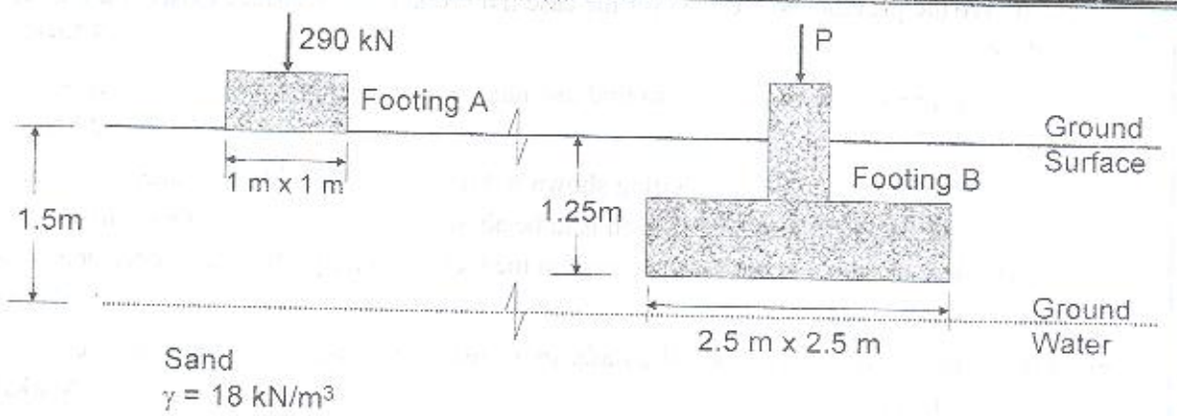


Figure (4)

ϕ °	N_c	N_q	N_γ		ϕ °	N_c	N_q	N_γ
0	5.0	1.0			27.5	25.0	14.0	7.0
5	6.5	1.5			30	30.0	18.0	10.0
10	8.5	2.5	0.5		32.5	37.0	25.0	15.0
15	11.0	4.0	1.0		35	46.0	33.0	23.0
20	15.0	6.5	2.0		37.5	58.0	46.0	34.0
22.5	17.5	8.0	3.0		40	75.0	64.0	53.0
25	20.5	10.5	4.5		42.5	99.0	92.0	83.0

Bearing Capacity Factors from the Egyptian Code of Practice – Shallow Foundations

Best Wishes.....

Course Examination Committee

Prof. Dr. Mohamed A. Sakr *Ass. Prof. Dr. Marawan M. Shahien*

Dr. Ahmed Farouk A. E. K.

Tanta University

Structural Engineering Department
Total Marks: 85 Marks

Faculty of Engineering

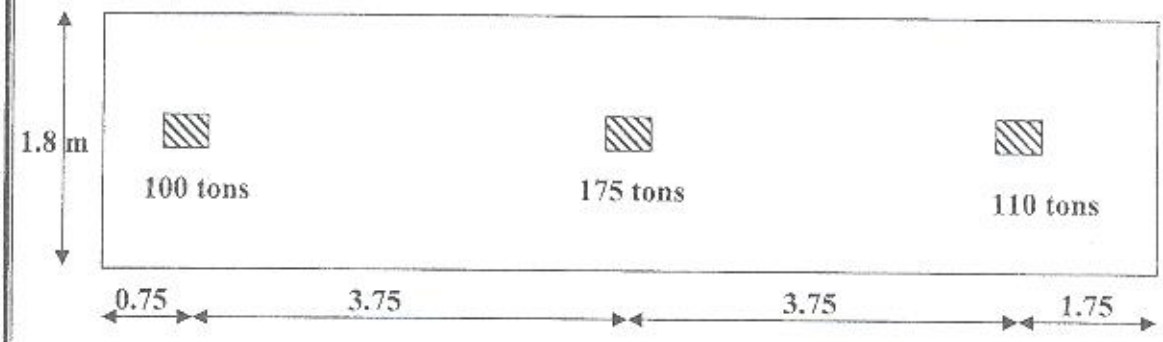
Course Title: Soil-Structure Interaction	Course Code: CSE3127	Year: 3rd
Date: January 25th 2011 (First term)	Allowed time: 3 hrs (Term Exam)	No. of Pages: (3)

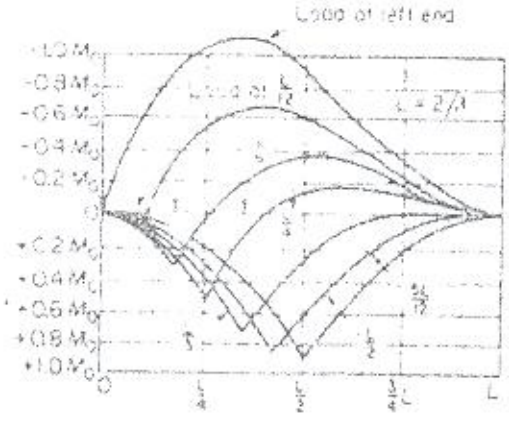
Answer the following questions … answers should be supported by sketches

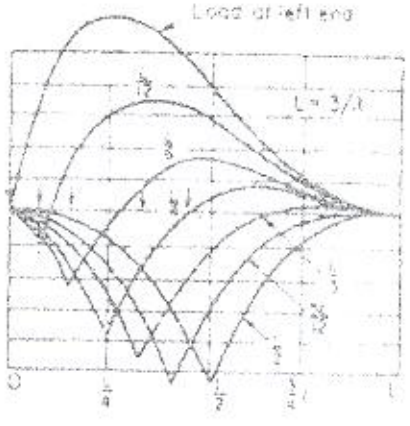
Problem number (1) **(17.0 Marks)**

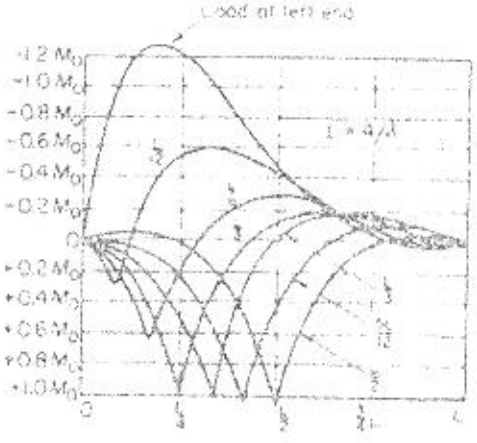
For the shown combined footing shown in the figure, find out the bending moment using elastic line method. If the following data is kown:- the thickness of the footing = 1.25 m

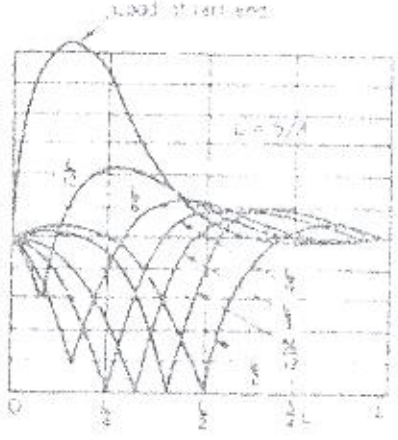
- Elastic modulus of reinforced concrete=2×10^{6} t/m^2 -Corrected sub grade reaction of soil = 2.00 kg/cm^3











Note: $\lambda = 4\sqrt{\frac{\beta_1}{4EI}}$

P.T.O.

Problem number (2) **(16.5 Marks)**

(a) what are the different material of facing and tie elements used in the reinforced earth retaining walls?

(4.5 Marks)

(b) For the shown reinforced earth retaining wall shown in figure 2, find out the required dimensions for ties and design the reinforced concrete facing elements. If the used fill is sand ($\varphi = 30^{\circ}$, $\gamma = 1.80$ t/m^3 and the L.L = 1.00 t/m^2) and ties are made of steel with width 70 mm and allowable stress is 1400 kg/cm^2

(12 Marks)

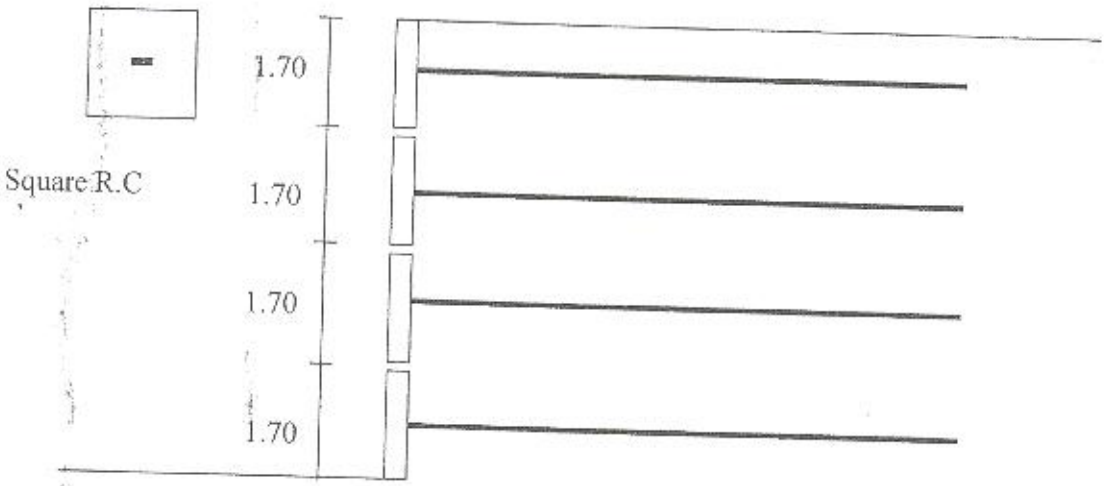


Figure 2

Question number (3) **(9.0 Marks)**

a) Discuss the different factors affect the coeffecien of subgrade reaction? **(3 Marks)**

b) Define the coeffiecit of subgade reaction, show the method of estimation its value in feiled and give the shape of expected relation. **(3 Marks)**

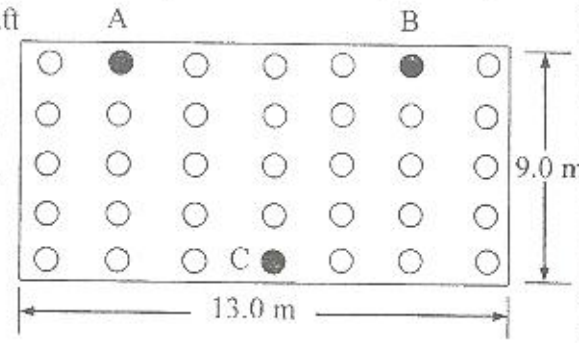
c) Using clear sketech show the methods of estimating the total settlement of clayey layer under uniform pressure. **(3 Marks)**

Problem number (4) **(21.0 Marks)**

a) Using clear sketches, discuss the difference between friction and bearing piles **(3 Marks)**

b) Draw the stress distribution along the surface area of friction pile. **(3 Marks)**

c) The figure shows the dimensions of a raft foundation over piles for a residential building. The total load of the structure = 4400 t acting in the left top quarter with e_x = 0.3 m and e_y = 0.20 m. The acting moment on the raft due to considering the lateral loads in y direction = 750 tm. If the pile diameter and spacing are 0.80 m and 2.0 m respectively.



(i) Determine the maximum load in the piles under vertical loads only. **(5 Marks)**

(ii) Determine the loads in the black piles (A, B, and C) under lateral loads. **(5 Marks)**

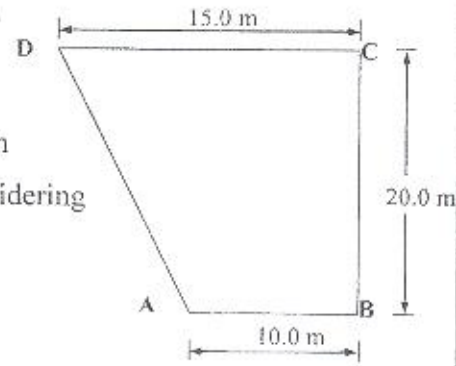
(iii)Determine the maximum and the minimum loads in the piles under vertical loads only if the black piles (A, B and C) were broken during the construction. **(5 Marks)**

Problem number (5) **(21.5 Marks)**

a) Using clear sketches, illustrate the difference between the strap and strip footing. **(3 Marks)**

b) State how to check the stability of isolated footing subjected to vertical and lateral loads **(2.5 Marks)**

c) The figure shows the dimensions of the raft foundation for a residential building. The total load of the structure is 6500 t acting in the right bottom quarter with e_x = 0.15 m and e_y = 0.25 m. The acting moment on the raft due to considering the lateral loads in x direction = 640 tm.
(consider I_{xy} for ◹ is negative)



(i) Determine the stresses under the raft foundation at point (B), (C) under vertical loads only. **(8.0 Marks)**

(ii) Determine the stresses under the raft foundation at point (A), (D) under both vertical and lateral loads **(8.0 Marks)**

اطيب الأمنيات بالتوفيق

Course Examination Committee

Dr. Mostafa ElSawwaf **Dr. Ashrf Kamal Nazir**

Tanta University

Department: Structural of Engineering
Steel Structures

Faculty of Engineering

Course Title: **Theory of plates and shells**	Course Code: **CSE3130**	Year: 3rd year structures
Date: **25/1/ 2011 (First term)**	**Term Exam**	**Three hours**

Answer All questions *(Assume any missing data and use neat sketches)*:

Q1)

a) What are the main assumptions of small-deflection theory?. Explain briefly each assumption?

b) Write down the strain curvature relationships of plate elements?

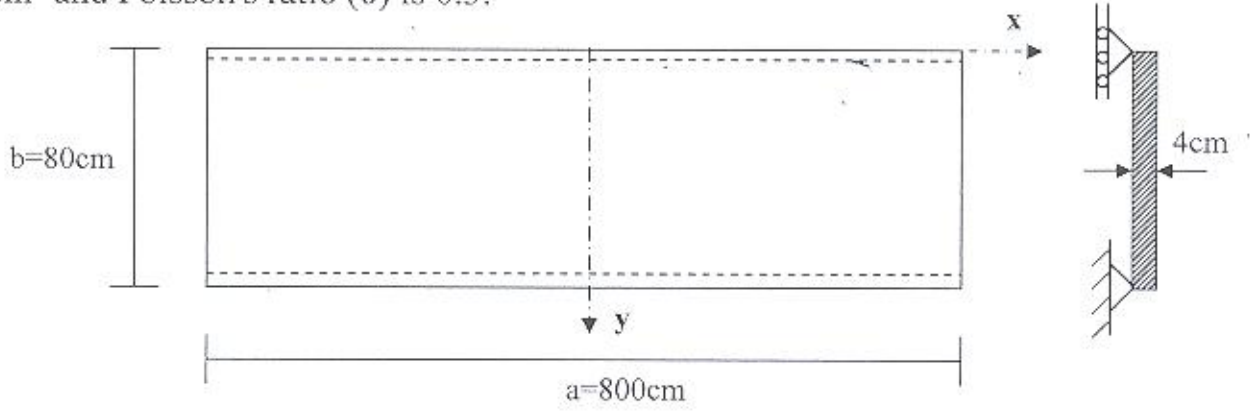
c) Write down the relationships used to calculate the stresses ($б_x$, $б_y$ and τ_{xy}) in plate elements?

Q2)

a) What are the main stress resultants acting on plate elements? Draw a sketch showing these stress resultants?

b) Derive the equations used to calculate the stress resultants acting on a plate element using the stresses ($б_x$, $б_y$ and τ_{xy})?

Q3) Determine the deflection, maximum deflection and maximum bending stresses ($б_x$, $б_y$) in the shown simply supported plate along the long directions only. The plate is subjected to uniform a sign curve pressure $p = p_o \sin(\pi y/b)$, where p_o is the peak stress at mid-plate that is equal to 1.2t/cm^2. Assume that the plate is narrow (a>>>b). The plate Young's modulus (E) is 2000t/cm^2 and Poisson's ratio (υ) is 0.3.



Q4) Using the approximate solutions of rectangular plates, determine the maximum uniformly distributed load that can be carried by a fully fixed-ended rectangular plate (2m×3m). The plate has a Young's modulus (E) of 2000t/cm^2, Poisson's ratio (υ) is 0.3, yield stress ($б_y$) of 3.6 t/cm^2 and has a thickness of 5cm. Determine the maximum deflection corresponding to that load?

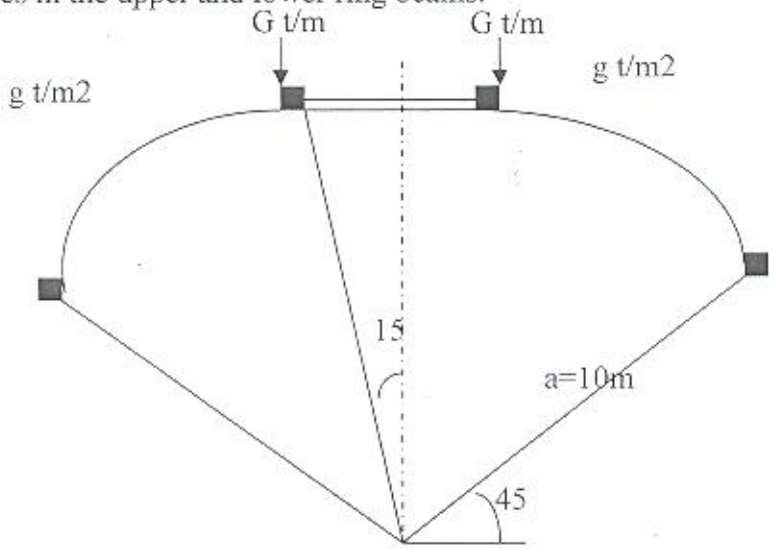
Given: $M_{bc}=(-1/12)pb^2/(1+\alpha^4)$, $M_{bc}=(1/8)pb^2/(3+4\alpha^4)$, $M_{ac}=(-1/24)pb^2$, $M_{ac}= 0.009pb^2(1+2\alpha^2+\alpha^4)$ and $w_{max}=0.032(1-\upsilon^2)pb^4/[(1+\alpha^4)(Et^3)]$

Q5) a) Drive the expression of $N_\phi = \frac{-1}{r_2 \sin^2 \emptyset}\left[\int \; r_1 r_2 (P_r \cos \emptyset + P_\emptyset \sin \emptyset) \sin \emptyset \, d\emptyset + C \right]$

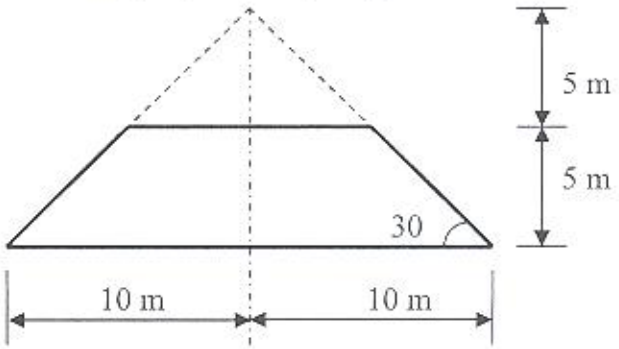
b) The hall shown in Figure (1) is covered by opened spherical shell of radius of 10.0 m with the *dimensions shown in the Figure.*

١- Calculate and draw the stress resultants in the spherical shell (Nϕ and Nθ) due to own weight g = 0.5 t per square meter of surface area and the load G=2 t/m.

٢- Calculate the forces in the upper and lower ring beams.



Q6) For the conical shell shown in Figure, it is required to calculate and draw the stress resultants in the spherical shell (Ns and Nθ) due to own weight g = 0.5 t per square meter of surface area



$$N_\phi = \frac{-1}{r_2 \sin^2 \emptyset}\left[\int \; r_1 r_2 (P_r \cos \emptyset + P_\emptyset \sin \emptyset) \sin \emptyset \, d\emptyset + C \right]$$

$$\frac{N\phi}{r_1} + \frac{N\theta}{r_2} = -P_r \qquad N_s = \frac{-1}{S \sin \emptyset}\left[\int (P_r \cos \emptyset + P_\emptyset \sin \emptyset) S \, ds + c\right]$$

كلية الهندسة

قسم هندسة الانشاءات

مجموع الدرجات: ٨٥ درجة

جامعة طنطا

عنوان المقرر: حساب الكميات و اعداد المواصفات	كود المقرر: CSE3126	الفرقة الثالثة
التاريخ: ٢٠١١/١/٢٧ (الترم الاول)	الزمن :٣ ساعات	عدد الصفحات : ٤

اجب عن جميع الاسئلة، كل سؤال فى صفحات متتالية، افترض اى بيانات ناقصة بقيم معقولة.

السؤال الاول: (٢٠ درجة)

أ- ضع علامة (√) امام العبارات الصحيحة وعلامة (×) امام العبارات الخاطئة:

١. يقوم مهندس المالك بعمل مقايسة تثمينية محدد بها التكلفة المراد عمل المشروع بها
٢. يقوم مهندس المقاول بتقديم مقايسة كمية فعلية فى نهاية المشروع فقط
٣. عند حساب كمية الحفر بواسطة مهندس المالك يجب ان يحدد ميل جوانب الحفر تبعا لنوع التربة
٤. يتم حساب كمية الحفر فى المقايسة التثمينية هندسيا من الرسومات
٥. حساب كمية الردم للمالك = حساب كمية الردم للمقاول
٦. الانتفاش هو زيادة حجم التربة نتيجة لتفككها بعد حفرها
٧. يمكن الردم باى نوع من انواع التربة
٨. من الاعمال التى تقاس بالعدد اعمال النجارة
٩. جدول الحصر هو نموذج من نماذج المقايسات التثمينية
١٠. يقوم المقاول بالاعلان عن مناقصة او ممارسة عن المشروع

ب- الشكل التالى لاحد خنادق تمديد مواسير الصرف الصحى بطول ١٠٠ متر و يوجد تحت المسورة فرشة من الخرسانة العادية كما هو موضح بالشكل. مع العلم بان هذا الخط فى تربة غير متماسكة (زاوية ميل جوانب الحفر ميل ١:١).اذا كان منسوب المياة الجوفية (-٠,٦٥).

المطلوب:

i. اقتراح بنود الاعمال فى دفتر الكميات الازمة لتنفيذ المشروع بالكامل
ii. اختيار وحدة القياس المناسبة لكل بند
iii. حساب كميات الحفر و الردم من وجة المالك والمقاول على حدة دون عمل مسطاح