Course Title: Design of Steel Structures	**Course Code:** CSE3124 **Year:** 3rd
Date: January 2016 (First term)	**Allowed time:** 3 hrs

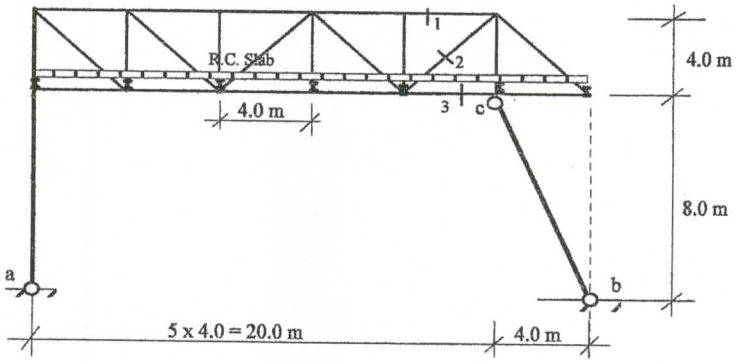
Remarks: 1- It is allowed to use any tables or Egyptian Code of Practice books, 2- Any missing data may be reasonably assumed, 3- Attempt all questions, 4- Max. Credit 100 % only, and 5- Number of examination pages:(3).

Question 1: (30 %)

The steel skeleton of a factory hall is built up of trusses type shown below. The system shown has three hinges at points a, b, and c.
Given the following data, answer the required questions.

Data:

- Spacing between trusses = 4.0 m
- Own weight of steel structure = 40 kg/m^2 of covered area.
- Live load = 100 kg/m^2
- Weight of cover = to be calculated for 10 cm R.C. slab
- **Neglect the effect of wind pressure.**
- Use steel grade **St52.**



Note: - **The cover is fixed at the bottom chord**
- **For arrangement of bracing consider that purlins are composite beam.**

Required:

1) Draw to sketch different views showing the arrangements of bracing system. The covered area is 24.0 x 28 m. (14%)
2) Calculate the design forces in marked members at 1, 2, and 3. (6%)
3) Design an intermediate purlin as bare rolled steel section. (10%)

Question 2:

(35 %)

Table (1) shows data given for truss members. By Using **St52**:

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	+18	5	-	-	Top chord
2	-15	4	4	2.0	Top chord Un-equal angles
3	+25	4	-	-	Bottom chord
4	0	5	-	-	Diag. member
5	± 10	3	3	3	Bottom chord

Question 3:

(15 %)

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.

$I = 4000\ cm^4$

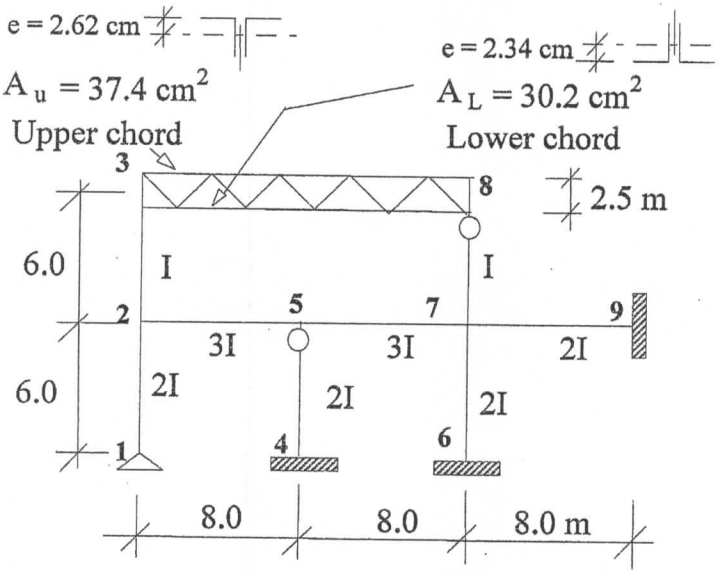
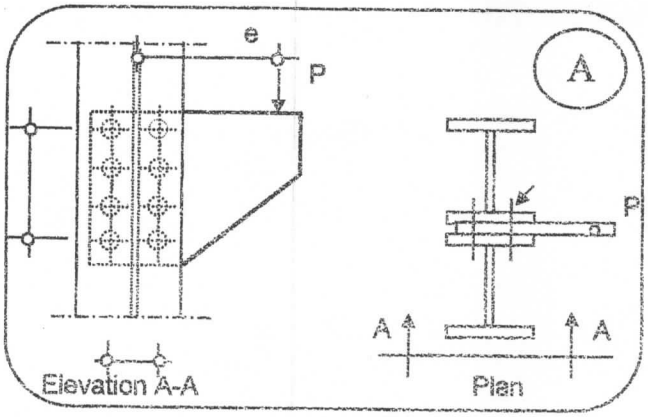
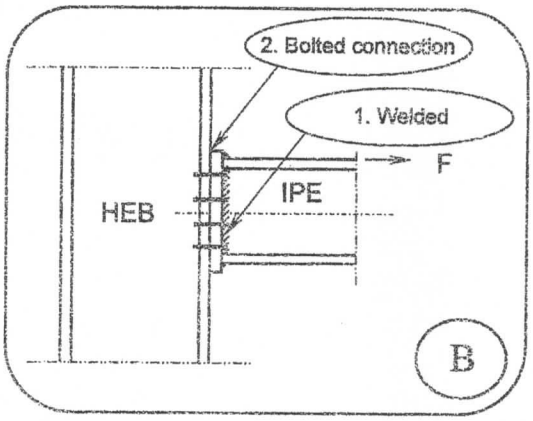


Fig. (2)

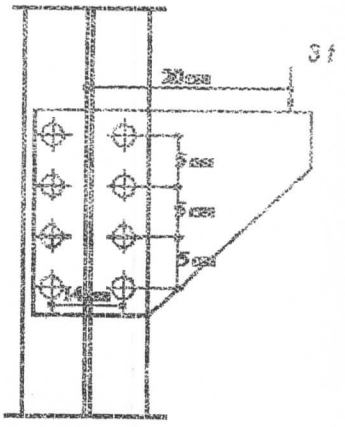
Question 4: (25 %)

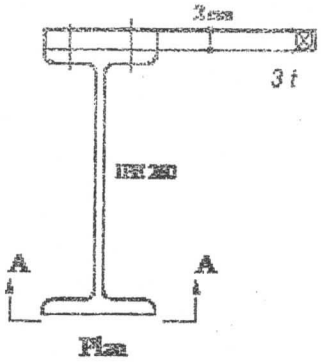
a) Describe, with net sketches and without any calculations, the straining action of the following steel connections at Figures A, B: **(10 %)**





b) Check the stresses for the bolts in the following bracket by using high strength bolts of grade 10.9 as bearing type (M16 mm) and use steel plate of grade St52. **(15 %)**





Best wishes,

Exam. Committee

٣ انتظامات (الجمعة) ٥.١٦/١/١٤

TANTA UNIVERSITY
FACULTY OF ENGINEERING
DEPARTMENT OF STRUCTURAL ENGINEERING
EXAMINATION (THIRD YEAR) STUDENTS OF STRUC. ENGINEERING هندسة إنشائية

COURSE TITLE: DESIGN OF REINFORCED CONCRETE STRUCTURES (2) a			COURSE CODE: CSE3123
DATE: January - 2016	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 problems in two pages.

For all problems consider: f_{cu}= 40MPa, f_y= 400MPa for all RFT. **TRY ALL PROBLEMS**

Problem # One (20Marks)

i) Illustrate effect of using closed stirrups in addition to longitudinal bars for resisting torsional moment in reinforced concrete beams? **(2Marks)**

ii) How is plastic hinge generate in RC beams? **(4Marks)**

iii) Differentiate between: primary and secondary torsion – shear and torsion failure? **(2Marks)**

iv) For sections subjected to combined shear and torsion, the maximum ultimate shear stress is, $q_{u,max} \geq \sqrt{q_{tu}^2 + q_u^2}$ for solid RC section, while for box – section $q_{u,max} \geq q_{tu}^2 + q_u^2$ – **why**? **(2Marks)**

v) Fig. 1 shows a plan of beam with cantilever **ABC** that carry a cantilevers **DE** and **CF**. Each cantilever carry the same ultimate loads, **Pu=?kN**. The supports **A** and **B** are restrained against rotation about Z axis. The torsional moment diagram (**T.M.D**) due to the applied loads is given in the figure neglecting the beams own weight. It is required to draw **B.M.D and S.F.D** for the main beam **ABC**. **(4Marks)**

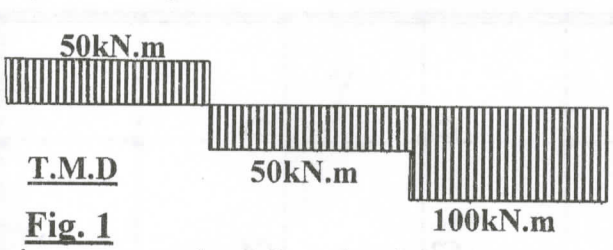
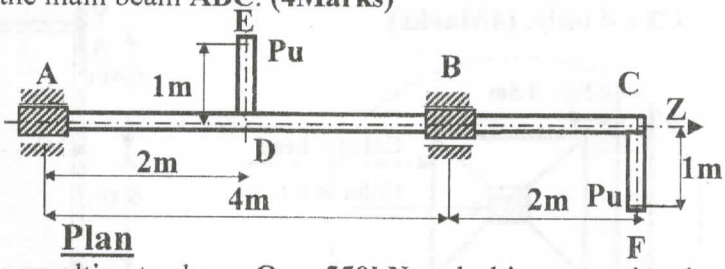


Fig. 1



Plan

vi) Design a rectangular RC section **0.4 × 0.9m** to carry an ultimate shear, **Qu= 550kN** and ultimate torsional moment, **Mtu= 140kN.m**. **(6Marks)**

Problem # Two (23Marks)

i) The cantilever slab in a H.B slab system is chosen solid slab if its thickness less than 80% depth of ribs at the adjacent panel - **why**? **(3Marks)**

ii) Fig. 2 shows a structural plan of roof supporting on five projected beams and six columns. The cross-section of all supporting beams is 250×800mm. System of **hollow-block slab** is required. The hatched slab area is dropped 100mm. The live load, L.L is 6kN/m^2 and flooring cover is 1.5kN/m^2. It is required to:

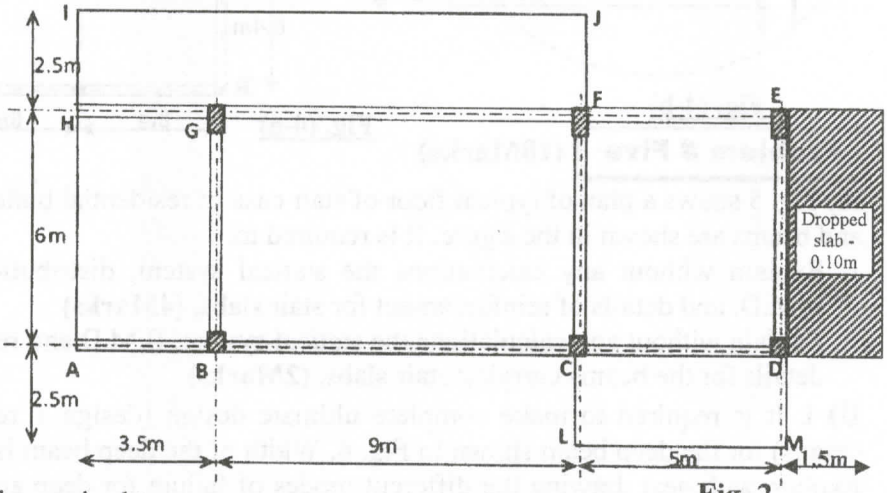


Fig. 2

a) Determine the load carried by critical strips for all slabs and draw its B.M.D and S.F.D. **(7Marks)**

b) Design the critical sections for all strips. **(7Marks)**

c) Draw on plan and in needed cross-sections the reinforcement details of the slabs and arrangement of the blocks and ribs. Compute number of hollow-blocks required to cover all slabs. **(6Marks)**

Problem # Three (4Marks)

Fig. 3 shows the layout of the first floor resting on eight columns with area 12.8×9.6m^2. 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**.

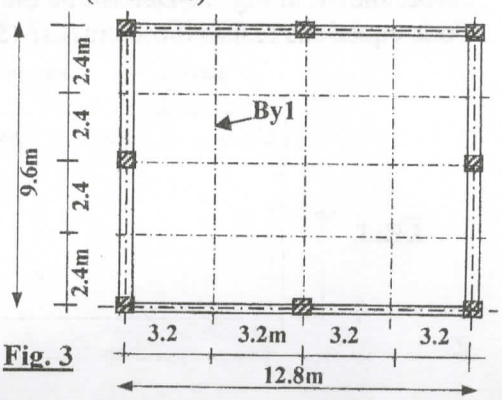


Fig. 3

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Problem # Four (22Marks)

Fig. (4-a) shows a plan of typical floor of RC flat slab with panel 8 ×6.4m and slab thickness 0.25m (t_s= 250mm) with column head 1.5m×1.5m. The flat slab is resting on square columns 0.5mx0.5m. The marginal beams 0.3mx0.8m are used at the outer edges of the flat slab **AB, AC** and **BD**. The edge **CD** is free without marginal beam. The flat slab is subjected to a uniformly ultimate load, **Wu= 20kN/m²**. Using the empirical method of the Egyptian code of practice, it is required to:

i- Determine the critical bending moments in column and field strips. **(4Marks)**

ii- Design the critical sections for moment in column and field strips for the intermediate panel **C1 C2 C3 C4 only. (4Marks)**

iii-1. Calculate the torsional moment transferred from the flat slab to both the internal column C1 and the edge column C5 considering the case of total load. **(4Mark)**

iii-2. Check one-way shear and two-way shear (punching shear stresses) for the internal column C1 for case of the total load only. **(4Marks)**

iii-3. What will be the torsional moment transfer from the flat slab to the internal column C1 if a large opening exists at a distance 0.5m from the edge of the column head in the previous problem, as shown in Fig. (4-b) considering case of the total load. **(2Marks)**

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

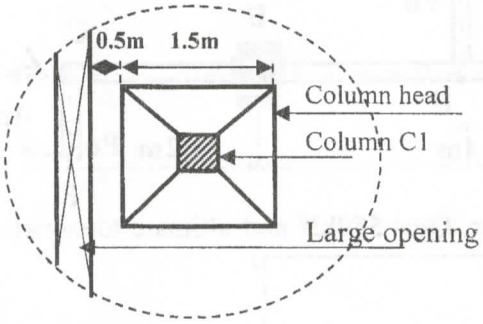


Fig. (4-b)

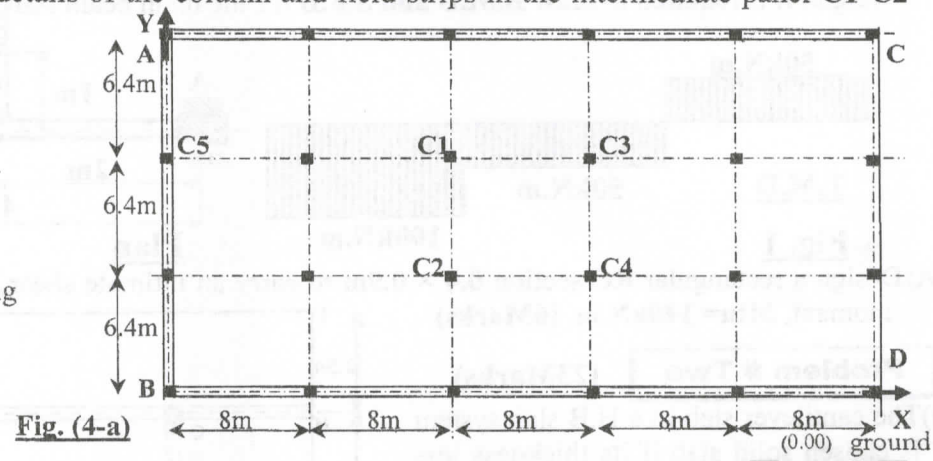


Fig. (4-a)

Problem # Five (18Marks)

A) Fig. 5 shows a plan of typical floor of stair case of residential building. The allowed columns and beams are shown in the figure. It is required to:

i. Explain without any calculations the statical system, distribution of loads, shape of B.M.D. and details of reinforcement for stair slabs. **(4Marks)**

ii. Explain without any calculations the statical system, B.M.D and reinforcement details for the beams carrying stair slabs. **(2Marks)**

B) i. It is required to make complete ultimate design (design + reinforcement details) for the deep beam shown in Fig. 6. Width of the deep beam is 400mm. Explain with neat drawing the different modes of failure for deep and shallow beams. **(5Marks)**

ii. What are the common cracks at corbels? What are the reasons of these cracks? **(2Marks)**

iii. What are effects of the forces **Pu** and **Hu** to generate cracks in a corbel shown in Fig. 7? Determine the required reinforcement resisting these cracks and state the Egyptian Code equations resists these cracks? **(5Marks)**

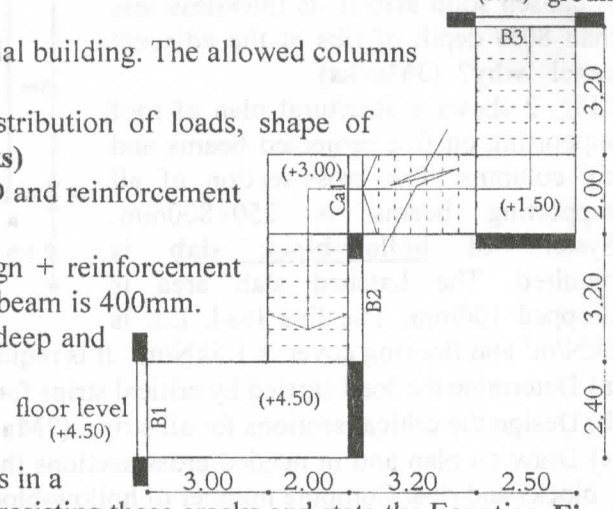


Fig. (5)

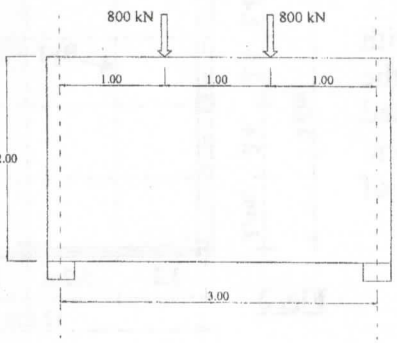


Fig. 6

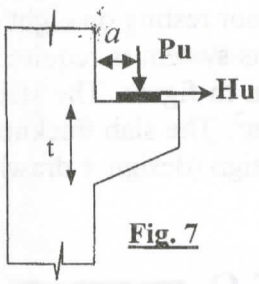


Fig. 7

All the best

Prof. Dr. Mohamed A. Kasem
Prof. Dr. Tarek Fawzy El-Shafiey
Assoc. Prof. Dr. Ahmed M. Atta

هندسة إنشائية (لائحة جديدة) امتحان
تصميم منشآت خرسانية مسلحة (٤١٢) :

TANTA UNIVERSITY
FACULTY OF ENGINEERING
DEPARTMENT OF STRUCTURAL ENGINEERING
FINAL EXAMINATION (4th YEAR) STUDENTS OF STRUCTURAL ENGINEERING

COURSE TITLE: Reinforced Concrete Design III-a			COURSE CODE: CSE 4137
DATE: Jan. 13, 2016	TERM: FIRST	TOTAL ASSESSMENT MARKS: 75	TIME ALLOWED: 4 HOURS

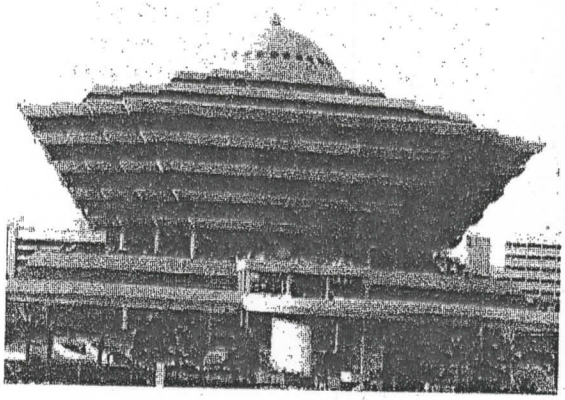
Notes:

- Systematic arrangement of calculations and neat sketches are essential
- All drawings should be presented in the Drawing Sheet
- Any missing data should be reasonably assumed
- Concrete characteristic strength $f_{cu} = 30\ N/mm^2$.
- Grade of reinforcing steel is 400/600 N/mm^2

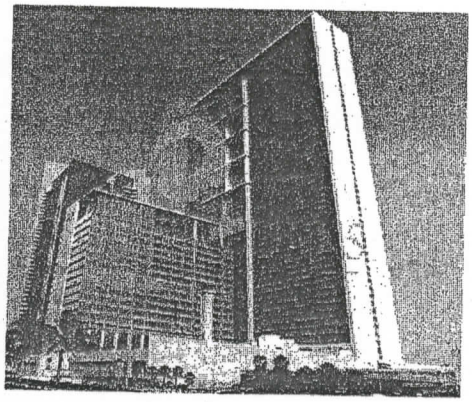
الإمتحان مكون من 3 أسئلة فى أربع صفحات

PROBLEM # 1 (20%)

a) Fig. (1) illustrates two of the structurally well-known concrete buildings in the Middle East. Fig. 1.a is a typical example of prestressed floor structure while Fig. 1.b depicts another example of tall building intersecting with a shorter building. As a structural engineer, ***give your judgment*** of the structural system and the main aspects of structural design. **(6%)**



a. Ministry of Interior, Riyadh



b. Burj Damen, Dubai

Fig. (1)

b) Two of the structural systems that can be used in bridge construction are Cable Stayed and Suspension bridges. ***Compare*** between these systems regarding: **(6%)**
- Bridge longitudinal section
- Mechanism of load transfer
- The developed internal forces in the bridge deck

c) ***Explain*** using approximate method of analysis the design steps of different elements for the box girder section shown in Fig. (2). ***Discuss***, using clear sketches, different methods used for bridge construction. **(8%)**

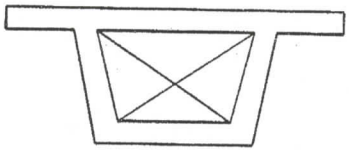


Fig. (2)

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PROBLEM #2: (20%)

a) Suggest a suitable cable profile for the presstressed concrete rectangular beam shown in Fig. (3) subjected to the given loads in cases of pre-tension and post-tension. Given that: P=450 kN and w= 40 kN/m **(3%)**

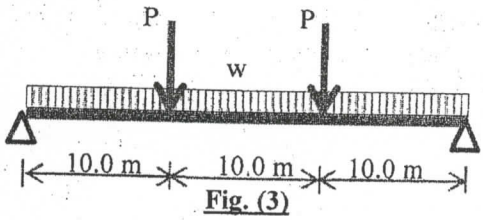

Fig. (3)

b) ***Evaluate*** the selection of the structural system for the 20 story administrative building whose structural plan is shown in Fig. (4) in terms of: (i) structural simplicity, (ii) uniformity and symmetry, (iii) bidirectional resistance and stiffness, (iv) torsional resistance and stiffness, (v) diaphragmatic action at story level, and (vi) adequate foundation. Given that flat slab floors are used with spacing between columns of 6.0 m in both directions. The foundation is raft over piles. **(4%)**

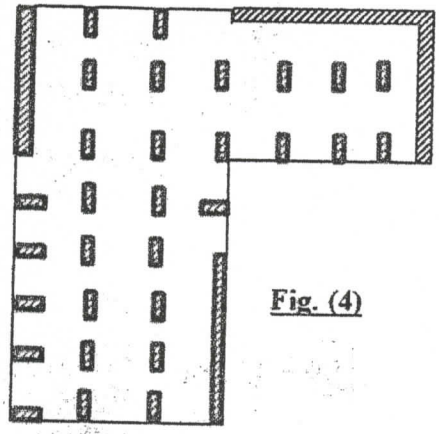
Fig. (4)

c) Shown in Fig. (5) is sectional elevation of two spherical RC domes. It is required to carry out the following: **(6%)**

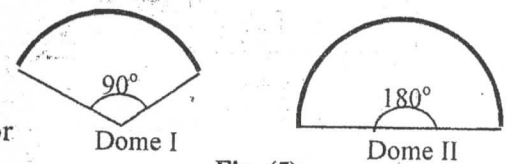

Fig. (5)

i. ***Sketch*** the main internal force diagrams for both domes that resulting from loading the domes with live load only.

ii. ***Name*** the theory that can be used to conduct the structural analysis for the shown domes and ***explain*** its basic assumptions and filed of application.

d) For the following statements, it is required to ***state*** which one is wrong and which one is right, then ***correct*** the wrong one: **(4%)**

i. Diaphragms of the folded plates roofs are assumed to be perfectly rigid in their own planes, but completely flexible out of their planes.

ii. Deformations of the cross-section for short cylindrical shell are more than those of the long cylindrical shell.

iii. Beam theory provides reasonable results for the case of trapezoidal-shaped folded plates.

iv. The developed transversal bending moments for both beamless single barrel and beamed single barrel for long cylindrical shell are the same.

d) For the following cross-sections of folded plates panels shown in Fig. (6), it is required to ***identify*** the locations of no ridge shear forces. **(3%)**

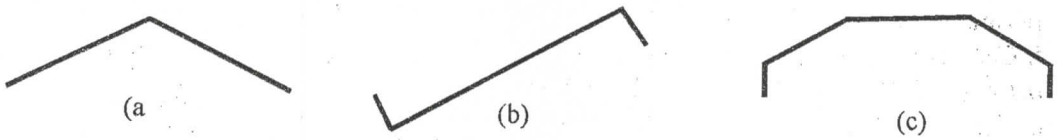

Fig. (6)

PROBLEM # 3 (65%)

Fig. (7) shows an architectural layout of a touristic compound to be built in Tanta City which is composed of four buildings. It is required to carry out the following:

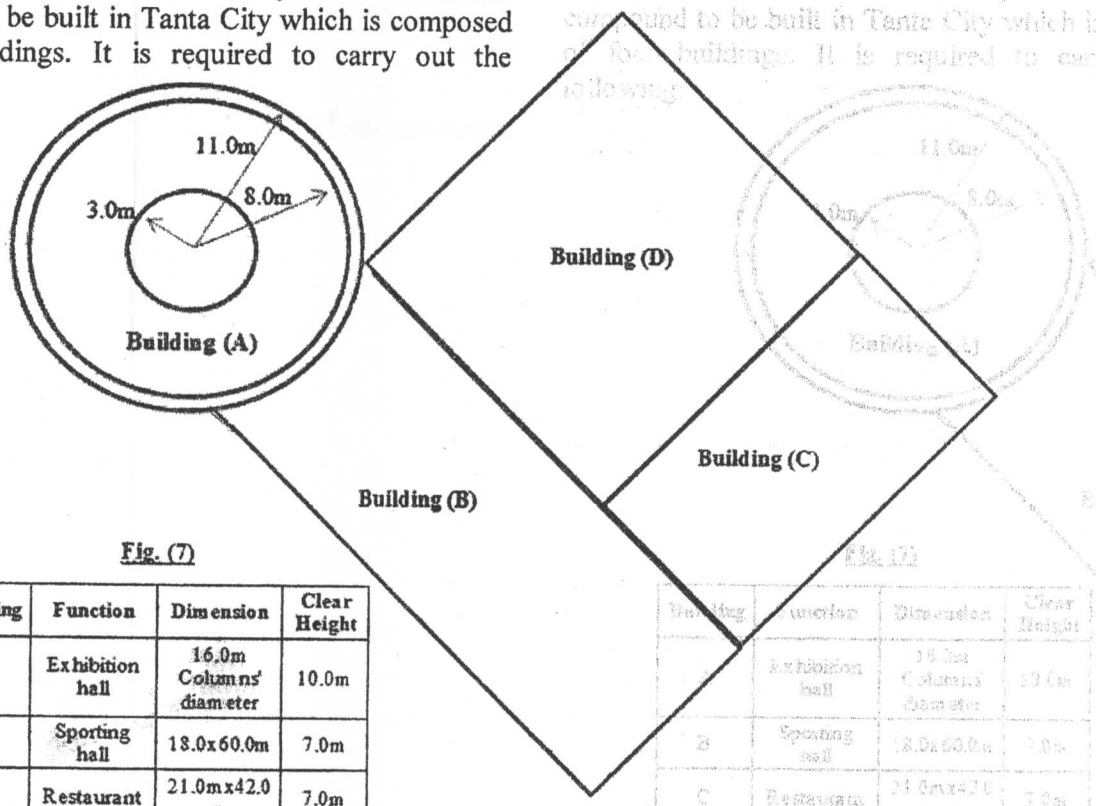

Fig. (7)

Building	Function	Dimension	Clear Height
A	Exhibition hall	16.0m Columns' diameter	10.0m
B	Sporting hall	18.0x60.0m	7.0m
C	Restaurant	21.0mx42.0 m	7.0m
D	Hotel	16 story building	4.2m / story

a) For the sectional elevation of building (A) shown in Fig. (7-a), the supporting columns are allowed only on the outer perimeter, **(15%)**

i. ***Conduct*** a complete design and details of reinforcement for the upper half sphere.

ii. ***Conduct*** complete design and details of reinforcement for ring beam B1.

iii. ***Draw*** the internal force diagrams for the RC cones (both parts BA & BC) and then, without any calculations, ***draw*** to a convenient scale its details of reinforcement.

iv. ***Sketch*** both load and internal force diagrams for ring beam B2.

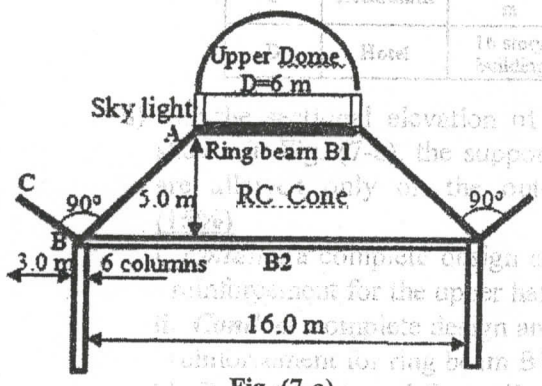

Fig. (7-a)

b) For the sectional elevation of building (B) shown in Fig. (7.b) for an intermediate RC ***beamed cylindrical shell*** barrel where columns are only allowed also on the outer perimeter of the plan layout, **(10%)**

i. ***Calculate*** the main tension reinforcement.

ii. ***Check*** of buckling for the critical section.

iii. ***Check*** of shear for the critical section.

iv. ***Draw*** to convenient scale plan and sectional elevation showing all concrete dimensions and details of reinforcement.

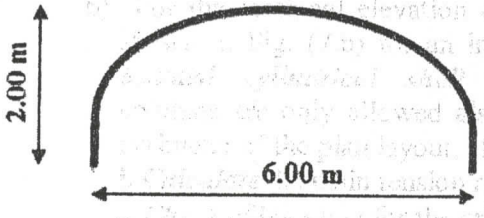

Fig. (7-b)

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c) For the sectional elevation of building (C) shown in Fig. (7.c) for an intermediate RC panel of folded plates roof covering where columns are only allowed on the outer perimeter of the plan layout, **(10%)**

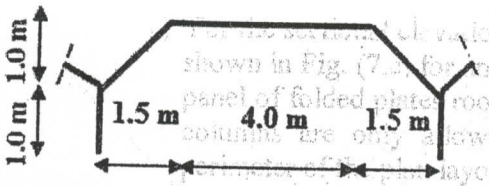


Fig. (7-c)

i.Design the given panel for the slab action.

ii.Calculate the ridge loads for all fold lines.

iii.Calculate the compatibility edge shear and then ***calculate*** and ***draw*** the normal stress distribution on the given panel.

iv.Draw to convenient scale sectional elevation showing the details of reinforcement of the folded plates.

d) As an alternative for building (C), pre-tension prestressed concrete beams are arranged beside each other. Tendon of constant eccentricity and 100m cover is used with the T-section shown in Fig. (7.d). For the critical sections, ***Check*** stresses at-transfer and working stages for full prestressing, with initial prestress of 800 kN and 10% losses. The superimposed dead load (without own weight) is 8.0 kN/m and the live load is 2.0 kN/m for each beam. Also, ***estimate*** the kerns of the section.**(15%)**

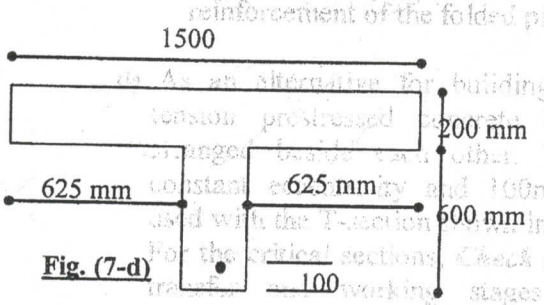


Fig. (7-d)

A= $45x10^4$ mm, I=$215x10^8$$mm^4$, Y_t=233mm, Y_b=567mm

e) For building (D) with RC skeletal frames with adequate ductility, the floors are flat slabs of 200mm thickness. The equivalent load of floor finish, walls and partitions is 3.0 kN/m^2. The foundation is raft of 2.0m total thickness (Reinforced and plain concretes). The foundation level is (-3.0) m on very hard clay stratum of 18.0m depth followed by continuous coarse sand layers, **(15%)**

i. Considering an external wind pressure factor C_e of 0.8 vertically upwards, ***determine*** the safety of the roof cover against uplift due to wind effect. Given that the roof cover is colored flex-polymer plate of total weight of 80kN and the basic wind pressure force is 90kN. ***Suggest*** solutions (if required).

ii.***Estimate*** the total design seismic base shear and overturning moment using the simplified modal response spectrum model.

انتهت الاسئله

مع أطيب التمنيات بالتوفيق،،

With Best Wishes,

Prof. Dr. Salah El-Din Taher,
Prof. Dr. Mohamed Hussein
Dr. Hamdy Mohi Afefy

(٣) الاصلية

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: 17 January 2016	Allowed time: 3 hrs	No. of Pages: (4)

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

Question Number (1) (12 Marks)

a) **Recall** using neat sketches the main factors that affect the compaction of soil. (2 marks)

b) **Outline**, using clear sketches, how to perform the modified Proctor compaction test on a sample of sand in the laboratory. (2 marks)

c) **Define** the term "Relative Compaction". (2 marks)

d) The following results were obtained using a standard proctor test:

Moisture content (%)	5	8	10	13	16	19
Bulk density (t/m^3)	1.87	2.04	2.13	2.20	2.16	2.09

If the specific gravity of the tested soil is 2.70, it is required to:

i. Draw the graph of dry density against moisture content and determine the maximum dry density, the optimum moisture content and the corresponding degree of saturation. (3 marks)

ii. Calculate the efficiency of compaction of a recently compacted fill constructed from the same soil described above, and show if the site is satisfactory compacted or not. The collected data of the sand cone test performed in the field are as follows:

- Initial weight of "sand cone apparatus + sand" = 6500.0 gm
- Final weight of "sand cone apparatus + sand" = 3700.0 gm
- Weight of sand used in the cone = 1523.0 gm
- Weight of soil removed from the test hole = 1750.0 gm.
- The unit weight of the standard sand = 1.50 gm / cm^3
- The water content of the removed soil = 10%. (3 marks)

Question Number (2) (15 Marks)

a) **State Yes or No and Why for the following statements (Use clear sketches)**:

I. The Plate Load Test doesn't give a satisfactory value of the ultimate settlement in cohesive soil.

II. The Plate Load Test doesn't give a satisfactory value of the ultimate settlement in layered soil.

b) A 65mm x 130 mm vane was pushed into clay and rotated; the shearing occurred when the applied torque was 18.0 Nm. When the vane was further rotated to remold the clay, the torque dropped to 8.0 Nm. The plasticity index of the clay was 38%. (Assume the correction factor μ=0.82).

$$(Su) = \frac{6Tmax}{7\pi D3}$$

I. Find the undrained shear strength and the sensitivity of the clay.

II. What would be the maximum load that can be applied to a 50 mm diameter sample collected from this depth?.

Question Number (3) **(10 Marks)**

a) **State** the main factors affecting on the bearing capacity of soil.

b) An isolated square footing installed in the soil profile shown in Fig. (1). and subjected to normal load of 150t and bending moment (My) of 15 m.t. **Check the bearing capacity** of supporting soils, assuming factor of safety against bearing capacity failure is 3.

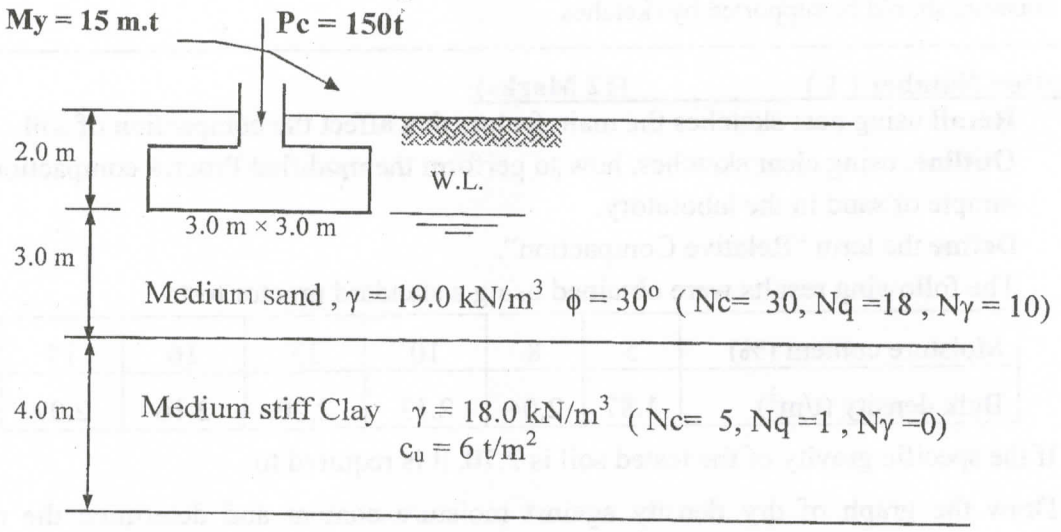


Fig. 1 Sand

Question Number (4) **(8 Marks)**

Consider the site shown in the following Figure (2). 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 5mx5m is founded at depth 1.25m. If the allowable column load P is 4875 kN for footing settlement of 25mm.

a) Estimate the ultimate bearing capacity of the footing.

b) What is the allowable bearing pressure fo allowable settlement of 2.5 cm?

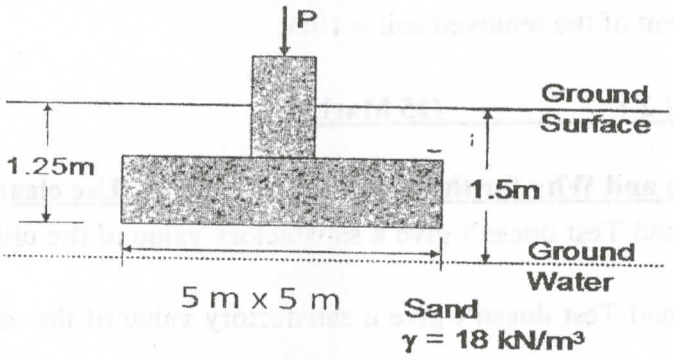


Figure (2)

Question Number (5) **(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) Use the expression derived in (a) to find the maximum stable slope where c' = 0 t/m2, φ' = 20° and γ = 19 kN/m3. (3 Marks)

c) Fig. (3) shows a cross section through a cutting in clay. ABC is a trial slip surface and CD is an assumed tension crack with 4.5 m deep that might be filled with water. The area ABCDE is 152

m2 and its centroid is at G. The density of the soil is 1.85 t/m3 and its cohesion is 35 kN/m2. Find the factor of safety against a slip along the surface ABC. (6 Marks)

d) If the slope described in (c) is unsafe, suggest, using clear sketches, only three different methods to protect this slope against failure. (3 Marks)

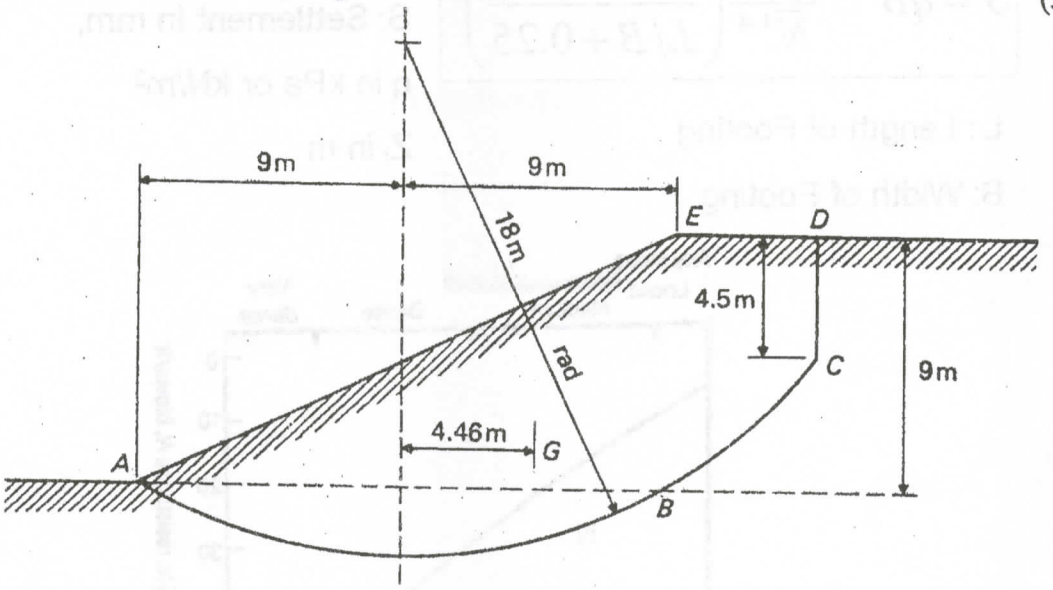


Figure 3

Question Number (6) ***(15 Marks)***

a) Discuss using sketches the relationship between the coefficients of lateral earth pressure versus movement of a wall.

b) Use clear sketches to show the different types of permanent retaining walls

c) Use clear sketches to show the different modes of failure for cantilever retaining walls.

d) Use clear sketches to show the measures to be taken to avoid accumulation of water behind cantilever retaining walls.

e) Show in clear sketches the typical steel reinforcement of cantilever retaining walls.

f) Details of a cantilever retaining wall are shown in Figure 4, the water table being below the base of the wall. The unit weight of the backfill is 17kN/m^3 and a surcharge pressure of 10kN/m^2 acts on the surface. The shear strength of the backfill are c'=0 and ϕ'= 36°. The angle of friction between the base and the foundation soil is 27°.

Calculate the following:

i. Factor of Safety against sliding.
ii. Factor of safety against overturning.
iii. The stress under the base.

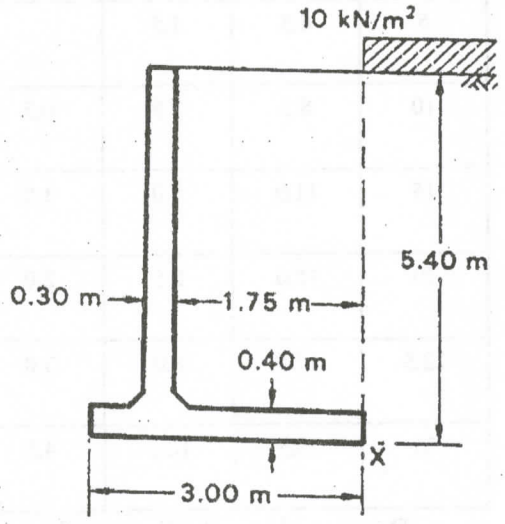


Figure 4

The Empirical Settlement Equation

$$S = qB^{0.75}\frac{1.7}{\overline{N}^{1.4}}\left(\frac{1.25L/B}{L/B+0.25}\right)^2$$

Units

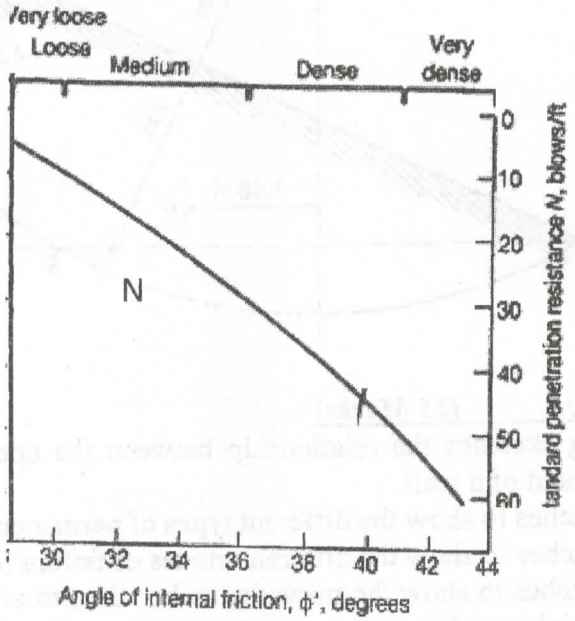
S: Settlement in mm,

q in kPa or kN/m^2

Z_i in m

L : Length of Footing

B: Width of Footing



Relationship between SPT N and Friction angle for sand after Peck et al (1974)

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

TANTA UNIVERSITY		FACULTY OF ENGINNERING

Structural Analysis (3)-A		**Course Code: CSE 3122**
Third Year (هندسة إنشائية)		**January 2016 (First Term)**
Allowed time: 3 hrs	**Total Marks: 85 Marks**	**No. of Pages: (2)**

Solve all questions

Question I (15 Marks)

The beams **ab** and **ebc** are connected to each other by rigid pendulum **be** as shown in Figure 1. Using the force method, draw the B.M.D and S.F.D and calculate the force in the link be due to:

- the given loads.
- a vertical settlement of 2 cm at support d (in the absence of loads) EI = 4400 m^2.t.

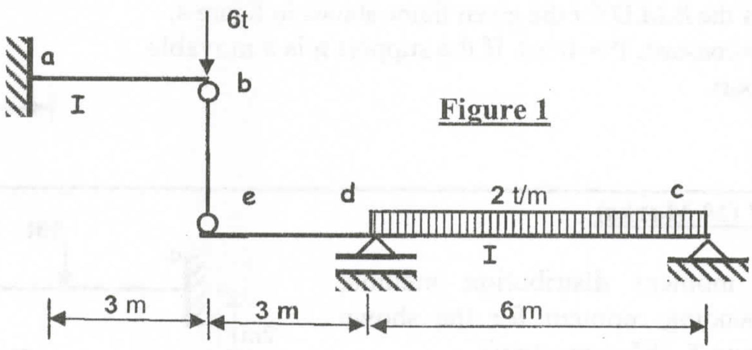


Figure 1

Question II (20 Marks)

For the frame shown in Figure 2 using the force method (EI= constant), It is required to:

1. draw the bending moment diagram due to the subjected loads.
2. draw the bending moment and shear force diagrams due to the horizontal movement at support **a** outward of the frame equals 2cm in the absence of loads. EI = 1000 m^2.t

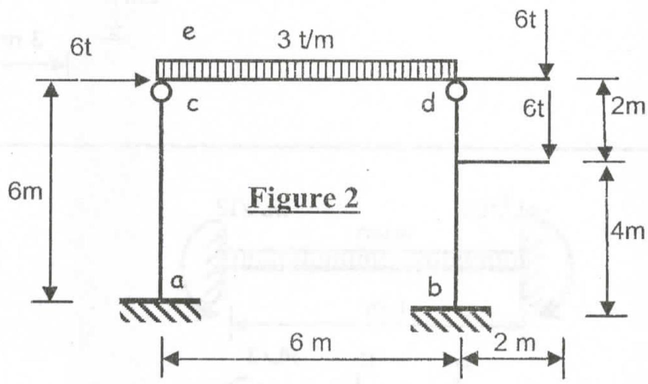


Figure 2

Question III (15 Marks)

For the shown frame in Figure 3, It is required to draw the bending moment and shear force diagrams using the force method. *(EI = constant)*

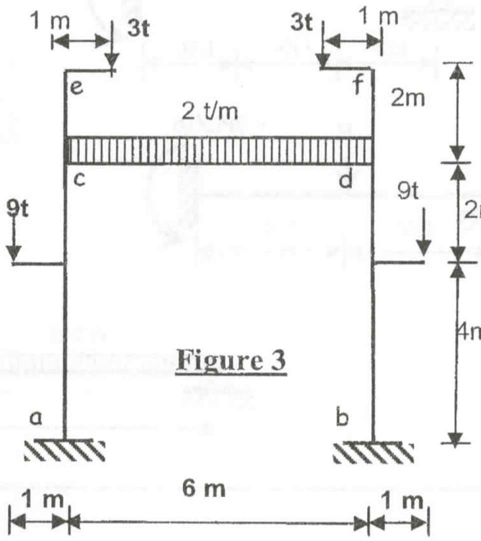


Figure 3

Question IV (25 Marks)

Using slope-deflection method, it is required to:

- draw the B.M.D for the given frame shown in figure 4. (EI = constant).
- find the uniform load P acting on the beam ad to produce a rotation at d equal 0.002 rad. Anticlockwise(θd = -0.002 rad.) if EI= $(6*10^3)/11$ m^2.t..
- draw the B.M.D for the given frame shown in figure 4. (EI = constant, P = 4t/m). If the support **a** is a movable support.

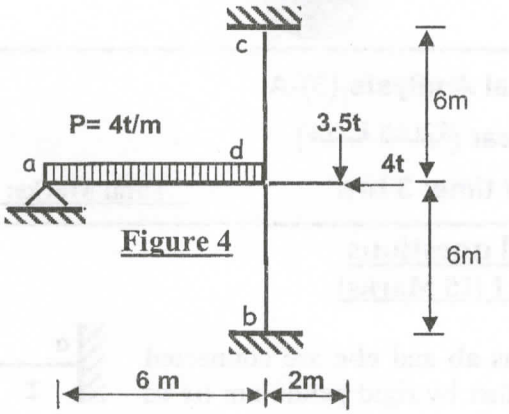


Figure 4

Question V (10 Marks)

Using the moment distribution method, draw the bending moment for the shown frame in figure 5. (EI = constant).

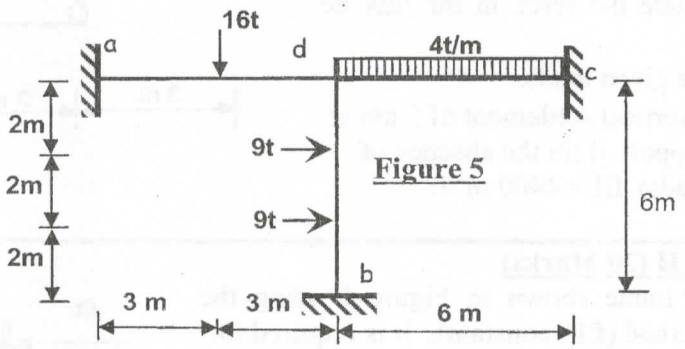
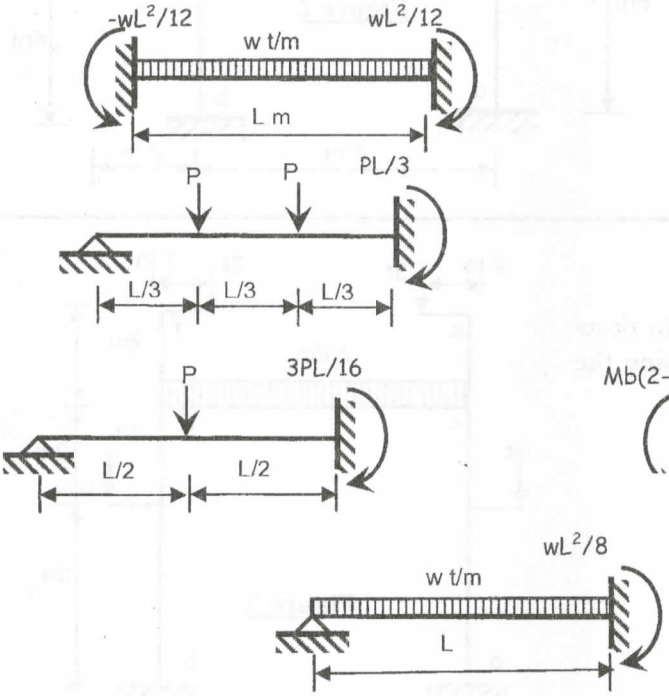
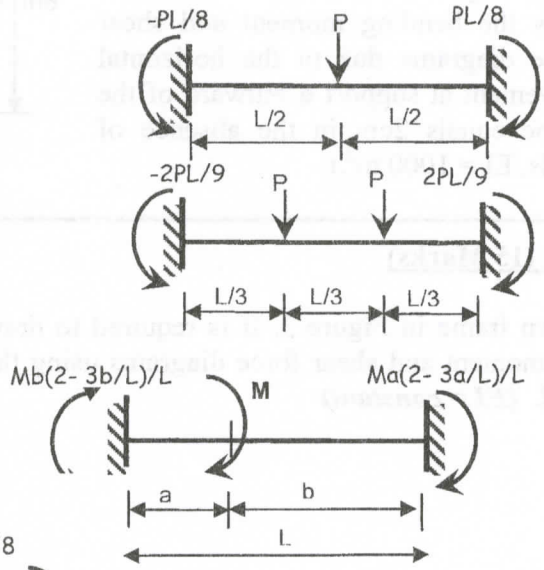


Figure 5

Hints:





٢ انشاءات ٢٠١٦/١/٢٠١٠

جامعـــــة طنـطـــا
كليـــة الهندســـة
قسم هندسة الانشاءات
يناير 2016

المقرر: حساب الكميات وإعداد المواصفات — كود المقرر: CSE 3126 — الفرقة : الثالثة إنشاءات
النهاية العظمى: 85 درجة — زمن الامتحان :3 ساعات — امتحان نهاية الفصل الدراسي الأول

الامتحان مكون من 3 صفحـــات
استخدم القلم الجاف الازرق او الاسود والقلم الرصاص فى اجابتك
أجب على الاســـئلة المطلوبة فقط ولن يلتفت الى الاجابات الزائدة

السؤال الأول (10 درجات):

[1] أذكر بإختصار أهم عناصر كتابة المواصفات.
[2] " فى أحد المشاريع الإنشائية الهامة تجاوز المقاول المنسوب التصميمي لقاع الحفر "، أذكر ما ينبغي على المقاول تنفيذه لتصحيح هذا التجاوز.
[3] أذكر ما تعرفه عن أهم المواصفات الواجب توافرها في أعمال الشدات والفرم.

السؤال الثاني (60 درجة):

الرسومات المرفقة فى شكل (1) تبين اللوحات الإنشائية لأحد المنشآت المكون من دور واحد فقط فى أحد المشروعات الصناعية الكبرى، المطلوب حساب كميات الأعمال التالية التي يتعين على مهندس المالك وضعها بقائمة الأثمان علما بأن عمق التأسيس = 2.25 متر اسفل منسوب الارض الطبيعية (منسوب الصفر المعماري) وارتفاع الدور من منسوب الصفر المعماري حتى سطح البلاطة الخرسانية يساوى 4.0 متر:

[1] الحفر لزوم القواعد.
[2] الحفر لزوم السملات.
[3] الخرسانة العادية للقواعد.
[4] الخرسانة المسلحة للقواعد.
[5] الخرسانة المسلحة للسملات.
[6] أعمال العزل المائي للأساسات (قواعد مسلحة – سملات – رقاب أعمدة).
[7] أعمال الردم.
[8] الخرسانة المسلحة للأعمدة.
[9] الخرسانة المسلحة لبلاطات السقف.
[10] الخرسانة المسلحة لكمرات السقف.

السؤال الثالث (15 درجة):

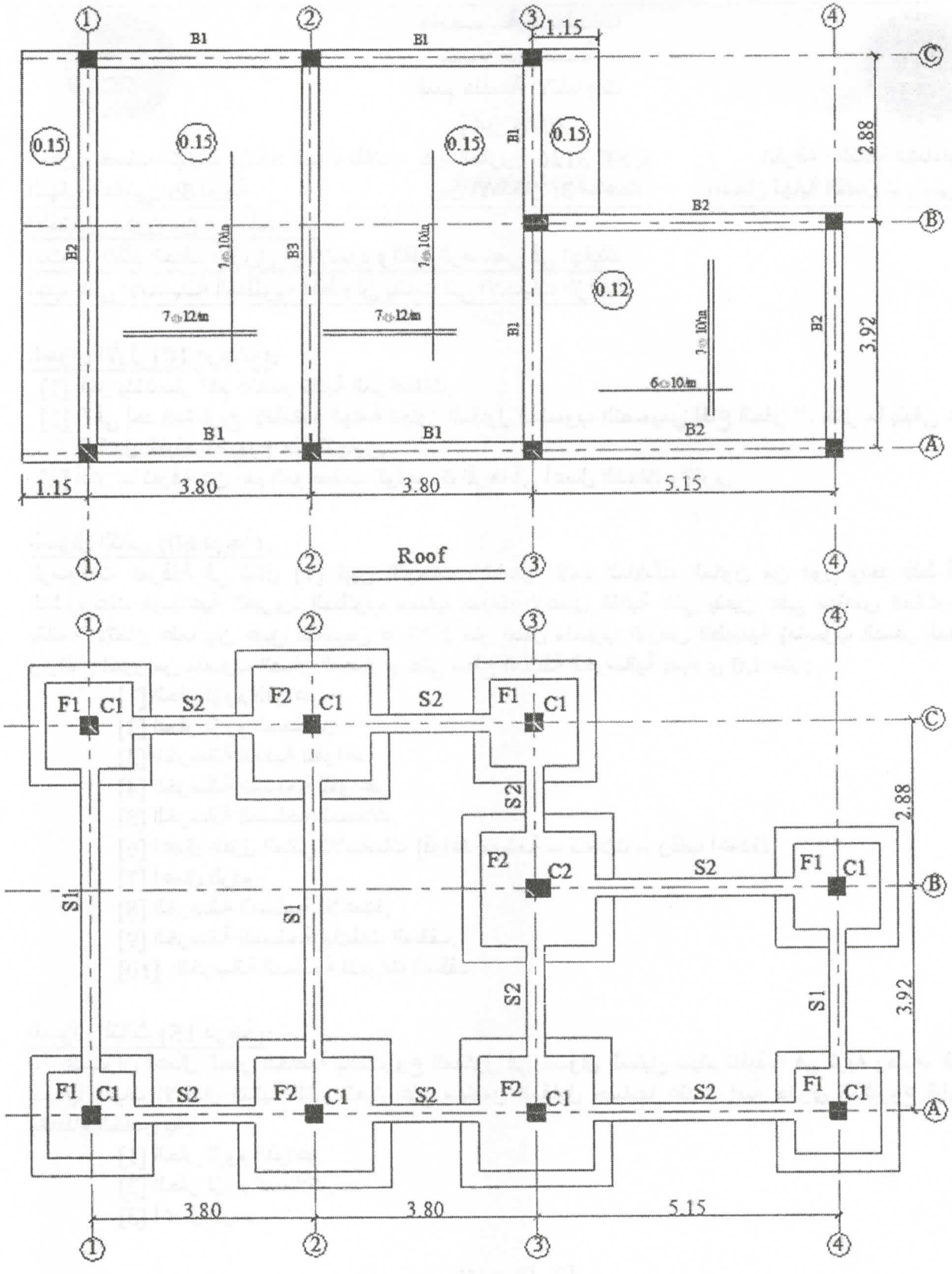
إذا علمت أن أعمال الحفر الخاصة بالمشروع المذكور في السؤال السابق سيتم تنفيذها في تربة رملية، المطلوب حساب كميات الأعمال التالية التي يتعين على مهندس المقاول حسابها عند دراسة جدوى المشروع قبل التقدم بالعطاء الخاص به:

[1] الحفر لزوم القواعد.
[2] الحفر لزوم السملات.
[3] أعمال الردم.

إنتهت الأسئلة

مع خالص تمنياتنا بالنجاح والتفوق

أ.د.م. / أحمد فاروق عبد القادر
واللجنـــة



Foundations

شكل (1)

Columns

Model	Section
C1	0.30 x 0.30
C2	0.30 x 0.40

Semelles

Model	Section	
	Width	Depth
S1	0.30	0.60
S2	0.30	0.60

Footings

Model	PC Dimensions			RC Dimensions		
	Length	Width	Depth	Length	Width	Depth
F1	2.40	2.40	0.40	1.60	1.60	0.60
F2	2.80	2.80	0.40	2.00	2.00	0.60

Table of beams reinforcements

Model	Section		lower reinforcement		upper reinforcement		Stirrups
	Width	Depth	Continuous	Stopped	At support	At middle	
B1	0.30	0.60	2Φ16	2Φ16	3Φ16	2Φ12	6∅8/m
B2	0.30	0.60	3Φ16	3Φ16	2Φ16	2Φ16	6∅8/m
B3	0.30	0.60	3Φ18	3Φ18	2Φ16	2Φ16	8∅8/m