تصميم منشآت خرسانية (١)

Kafr El-Sheikh University		Reinforced Concrete 1
Faculty of Engineering		Final exam
Civil Engineering Department		Date: June,7th 2018
2nd Year Civil , 2nd Term	Full mark = 75	Time: 4 hours

- **Answer all the following question.**
- **Any missing date may be reasonably assumed.**
- **This course satisfy ILOS of A4, A5 and A6- B4, B5 and B11- C3, C4 and C6- D1, D2, D6 and D7**

يسمح باستخدام جداول و مساعدات التصميم الخرسانيه

Question No. 1 (20%):-

a) a) *Mention the **zones of interaction diagram** showing only **define and conditions** for each one.*

b) *Design the critical sections of frame shown in **Fig. 1**. F_{cu}=35 N/mm^2, f_y=360 N/mm^2*

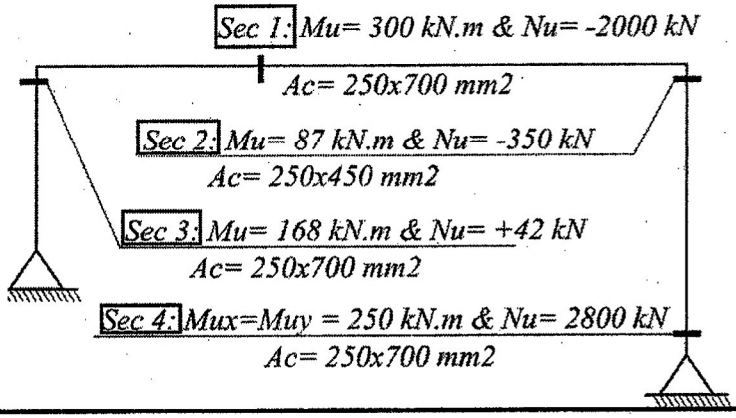


Fig. 1

Question No. 2 (20%):-

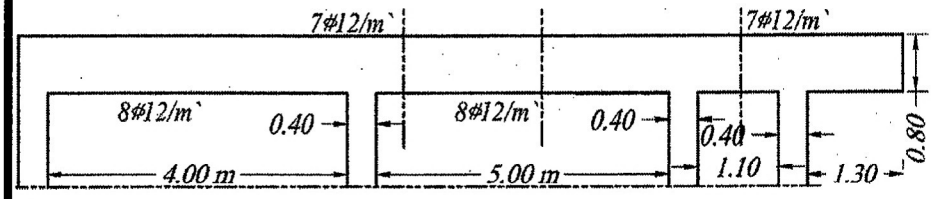
a) *Define with sketch if any:-*

- *The **reinforced concrete walls**, its **types**, **reinforcement** recommendations according to ECP. Mention with sketch how to **reinforce the opening** existing in R.C walls.*
- *Resisting deflection for flexural elemnts*

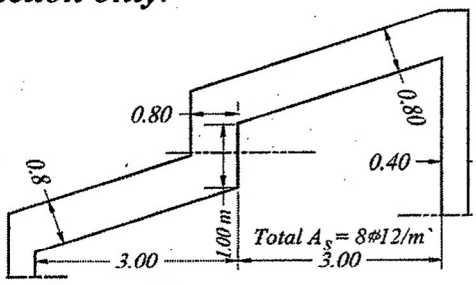
باختصار تكلم عن استلام : الأعمده (نجاره و حداده) - الكمرات (حداده) – البلاطات (حداده) – الحوائط المفرغه(حداده)

- *Details of R.F.T for columns resisting seismic loads.*

b) *The given longitudinal sections are for a two beams with given cross sections(A_c) and steel reinforcement (A_s) shown in **Fig.2**.It is required to draw the reinforcement details presenting longitudinal section and the **determined cross section only**.*



(a)



(b)

Fig. 2

Question No. 3 (65%):-

*The given structural shown in **Fig. 3** is for a building designed based on the following data: Slab thickness (t_s) = 120 mm - Floor covering (F.C) = 1.50 kN/m^2- Live Load (L.L) = 2.00 kN/m^2 -Wall density (γ_w) = 12 kN/m^3-Wall thickness = 250 mm – Number of floors=**10 floors** - f_{cu}=35 N/mm^2 & f_y = 360 N/mm^2- **All beams have $A_{c\ beam}$=250x700 mm^2** - **the building is braced in both directions**.*

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It is required to execute the follows:-

a- *It is required to check both **deflection and cracking width** for slab **S**.*

b- *Provide a **full design** followed by reinforcement details with scale of 1:50 **FOR ONLY strip I-I.***

c- ***Sketch with a suitable scale** the total RFT of slabs for the whole plane.*

d- *Estimate the load carried over column **C1**,followed by a design as a **tied rectangular column**. Then, calculate the new ultimate load (P_u as a **composite column**) if an IPE 330 with an area of 6260 mm^2 was added.*

e- *With the same estimated load , Re-design column **C1** as a **spiral one**.*

f- *IF you know that the building is **braced in both directions**, design Column **C2** (**shown in plan and Fig. 4**)with a predicted dimensions about **(300x600)mm^2** to resist an ultimate load of **P_u=3000 kN**.*

g- *Design the **Tie** member shown in **Fig. 5**.*

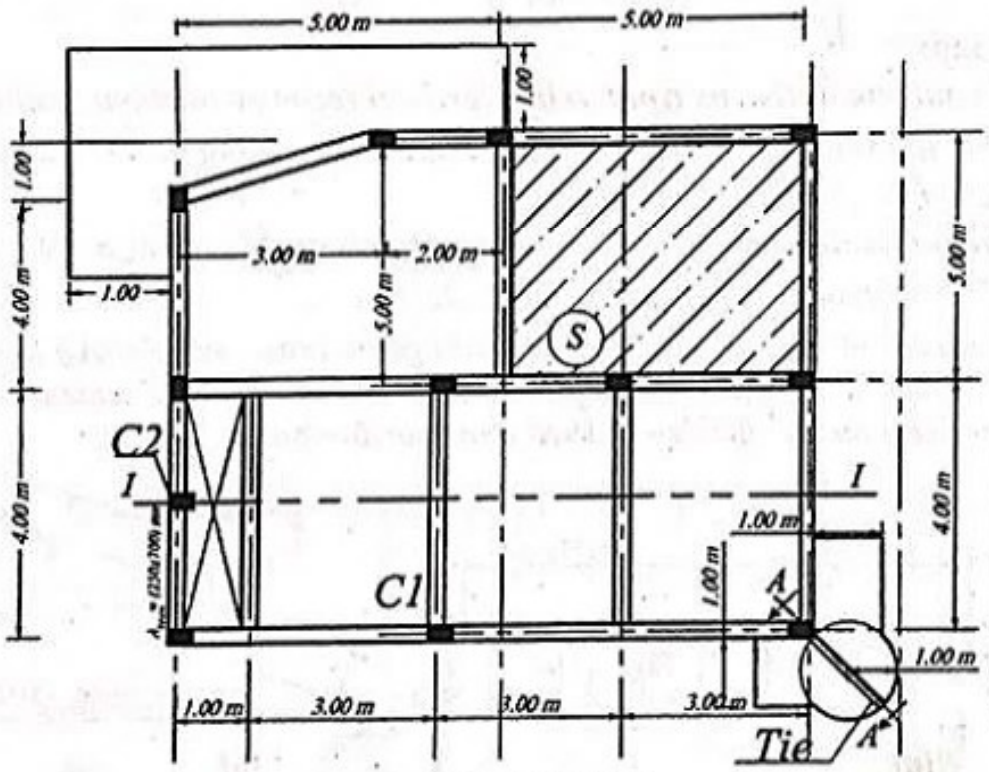

Fig. 3;PLAN

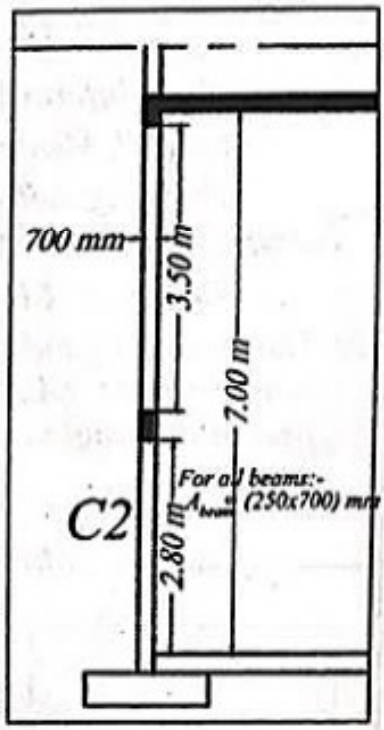

Fig.4; Sec I-I

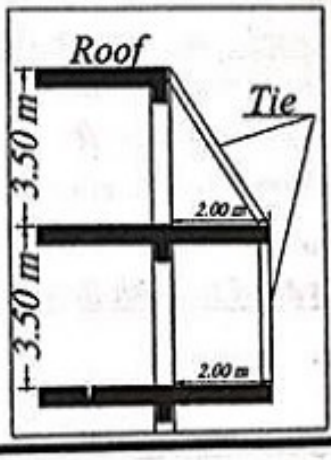

Fig.5; Tie section

مع خالص دعواتي القلبية بالاستفادة الكاملة بالمنهج المعطي

د.م/ أحمد عبدالله أحمد حموده واللجنه