



Dept. of Civil Eng.
Faculty of Engineering
Assiut University
2nd Semester –Evaluation
2019/2020 - June 2020

Const. Eng. & P. M. program
Strength & Prop. of Materials
2nd level
Course Evaluation
Marks: 100



	اسم الطالب
	الرقم الأكاديمي
خواص و مقاومة المواد-2	اسم المقرر
الثاني	المستوى
التطبيقات الهندسية لخواص و مقاومة المواد المستخدمة في البناء	عنوان البحث المرجعي

الدرجة	رقم السؤال
	الأول
	الثاني
	الثالث
	المجموع

توقيع لجنة الامتحان

pro.megahed.exam@gmail.com

ا.د./ عبد الرحمن مجاهد + اللجنة



Question No. 1 : (40 marks)

1-a) Define the following properties of concrete showing how you can determine each one experimentally?

Splitting strength - Compactability - Bond Strength.

(10 marks)

1-b) Explain briefly how the following factors affect the compressive strength of concrete?

Age of concrete - shape and size of test specimen - Rate of loading -

- Curing of concrete - Sand/gravel ratio.

(10 marks)

1-c) A neglected weight mild steel simple beam is shown in Figure (1), it is required to calculate the following?

- The value of the load (P) so that the max. elastic tensile stress does not exceed 1.4 t/cm^2
- The value of the load (P) so that the the max. elastic shear stress does not exceed 0.8 t/cm^2
- The value of the load (P) so that the the max. elastic deflection does not exceed 2 cm
- The shape factor of the given cross section.
- The ultimate (Plastic moment) that the section can withstand about x-x axis.

Given : $E = 2.1 \times 10^6 \text{ kg/cm}^2$ $\sigma_{yt} = \sigma_{yc} = 2.8 \text{ t/cm}^2$ (20 marks)

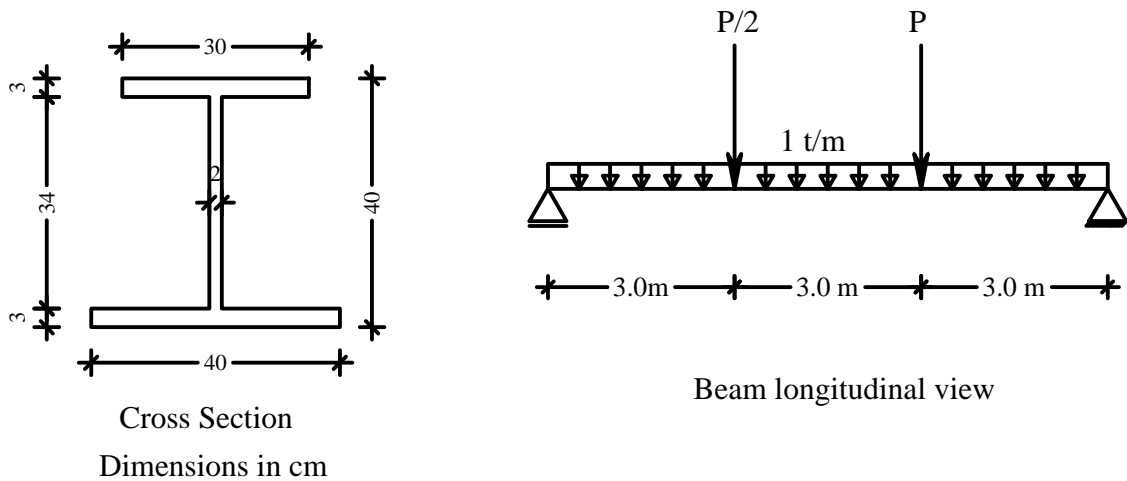


Figure (1)

Question No. 2 : (30 marks)

2-a) What is meant by Fresh concrete? State the different phases of it showing the following:

- How to measure such property or phase?
- What are the factors affecting such property?

(5 marks)

2-b) What is meant by hardened concrete? State the different phases of it showing the following:

- How to measure such property or phase?
- What are the factors affecting such property?

(5 marks)

2-c) Discuss briefly the following items:

Characteristic strength - Bearing strength - Flexural strength - poisson's ratio

- Angularity index - Surface factor of aggregate.

(5 marks)

2-d) What is meant by concrete additives and durability of concrete?

(5 marks)

2-e) A concrete mix of proportions (1:2:m:w/c) by weight is made of O.P.C, this concrete mix is designed to achieve a compressive strength of 275 kg/cm^2 . It is required to calculate the following:

- The expected compacting factor for this concrete mix.
- The amount of constituent materials required for (200 m^3) of concrete
- Check the segregation of the produced concrete.

Given:

$$F_c \text{ cement} = 400 \text{ kg/cm}^2 \quad \gamma_c = 3.15 \quad A_{ig} = 1.85 \quad A_{is} = 1.80$$

$$\gamma_s = 2.6 \quad \gamma_g = 2.7 \quad \bar{\gamma}_g = \bar{\gamma}_s = 1.69 \text{ t/m}^3 \quad A = 0.55 \quad \alpha = 1.4$$

The M.N.S of the used combined aggregate = 3/4 inch

(10 marks)

Question No. 3 : (30 marks)

3-a) Explain the effect of the water/cement (w/c) ratio on the following properties of concrete:

Workability - Compressive strength - Creep - shrinkage.

(5 marks)

3-b) What is meant by the following properties:

Consistency - Segregation - Permeability - Bleeding - plastic shrinkage -

Creep recovery.

(5 marks)

3-c) Explain the difference between:

- Mobility and maturity of concrete.
- Creep recovery and elastic recovery.

(5 marks)

3-d) State the advantages and the disadvantages of the plain concrete as
a structural material showing how you can overcome it's disadvantages

(5 marks)

3-e) For a certain project of concrete construction, standard cubes of 15x15x15 cm of the corresponding mix were cast and tested under axial loading after 28 days.

the recorded values of obtained strength were as follows:

210 , 180 , 190 , 180 , 180 , 200 , 210 , 190 , 190 , 180 , 190 ,180 ,180, 190 , 180
220 , 200 , 180 , 200 , 190 , 250 , 240 , 270 , 200 , 210 , 190 , 180 , 200 , 170 ,160
200 , 230 , 250 , and 240 kg/cm².

For this mix of concrete it is required the following.

- Estimate the min. compressive strength of such type of concrete ($K=1.64$).
- Determine both the modulus of elasticity and flexural strength for such concrete.

(10 marks)

الاشتراطات:

- يتم الاجابة بخط اليد او على الحاسب الآلي. ويفضل الكتابة باستخدام برنامج الورد باستخدام خط Times new roman بحجم خط 12-14.
- في حالة الاجابة بخط اليد يتم سحب الحل علي اسكانر بصيغة PDF مع الاحتفاظ بالاصل.

طريقة التواصل مع الطلاب:

- عن طريق الايميل او عبر الواتس علي الرقم 01112762786

طريقة التقديم:

على كل طالب ارسال البحث المرجعي بصيغة **pdf** على البريد الالكتروني: pro.megahed.exam@gmail.com

مع تمنياتي بالتوفيق والنجاح ،،، ا.د./ عبد الرحمن مجاهد + اللجنة