University of Palestine

Course No: CVL 2310
Course Title: Concrete Technology
Date: / /2018
No. of Questions: (4)
Time: 1hours
Using Calculator

Final Exam
Second Semester
2017/2018
Total Grade:

Instructor Name: Dr.Ayed Zuhud
Student No.: _____
Student Name: _____
College Name: _____
Dep. / Specialist: _____
Using Dictionary-No –Closed book

Question One:

Mark the following phrases true or fouls between brackets

1) Mortar+ aggregate → concrete ( )
2) The initial set starts when the needle tip at 5.5 mm from the bottom ( )
3) The kiln temperature is about 700 °C ( )
4) To find the change of cement volume soundness test is needed ( )
5) Segregation is defined as the collection of components of a fresh concrete mixture ( )
6) Type four of cement contains quantity of Alite more than Belite ( )
7) Aggregate retained on sieve 9.5 mm are coarse aggregate ( )
8) Compaction test used to define workability ( )
9) Flow test is property of hardened concrete ( )
10) Zero slump is the indication of very low water-cement ratio ( )

Question Two:

1-Using neat drawing , show the types of of ***concrete slump results***

2-Show using neat and precise curves the effect of age on ***compressive strength for different w/c ratios***

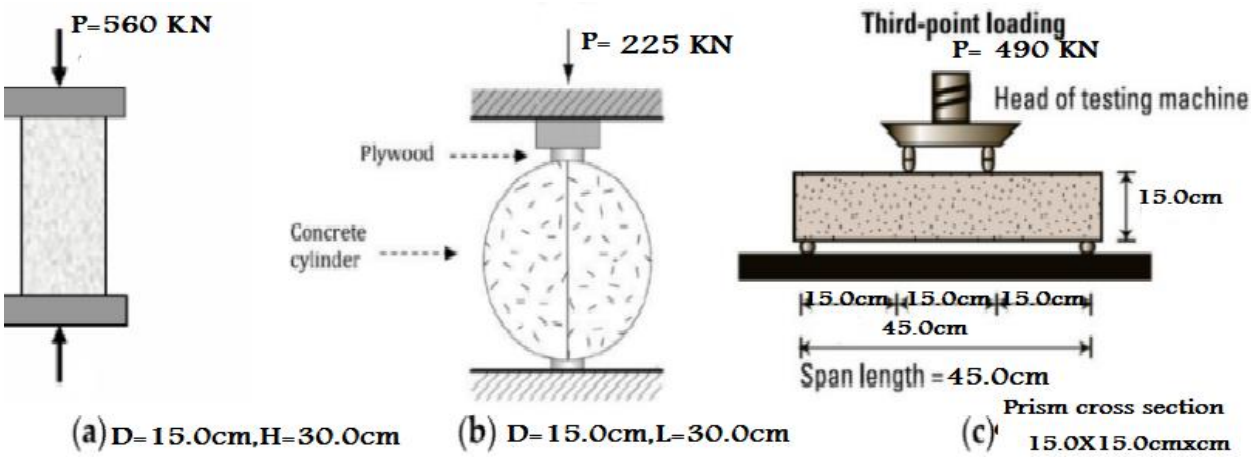
3-Using neat curves ,show the effect of ***temperature on compressive strength*** of concrete

4-Show the influence of the ***water/cement ratio and moist curing on concrete strength***(different ages of concrete

5-***The size of aggregate influences the compressive strength*** of concrete Show this sentence using appropriate curves.

Question Three:

Cylindrical specimens and prism of hardened concrete were tested to find its compressive strength , tensile strength and flexural strength respectively the average load failure of specimens are shown in the figure ***.a)Compute the specified strength for each test in Mpa ,b)What is the relationship between compressive strength with tensile and flexural strength respectively.***



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Question Four:

Quality engineer is working in ready mix concrete factory at Gaza Strip) .He was intended to prepare a mix of ***Non air entrained concrete*** *of* ***30Mpa*** cylindrical compressive strength with a slump of **75 mm** .The data that was given for him are as following :

a)The C.A and F.A was oven dried ,b)The specific gravity of C.A and F.A were**2.65** and **2.7** respectively ,c)The dried oven of C.A was **1680 Kg/cm^3,**d)The fine modulus of F.A was **3.0** ,e)The absorption water capacity of C.A and F.A were **2.8 and 2.0 %** respectively ,f)The max size of aggregate was **25 mm**

If it is required **3%** of results to be lower than the chrahsterestic strength and the standard deviation was **3 Mpa**

1-*Find the quantities of all materials required for the previous state listed*

If the C.A was exposed to rain so the free moisture content was 1.5%

2-Find the quantities of all materials required

(Suppose any missing data)

End of Questions
Good luck

Percentage of results allowed to fall below the minimum			*Value K*
0.1	...	...	3.09
0.6	...	...	2.50
1.0	...	...	2.33
2.5	...	...	1.96
6.6	...	...	1.50
16.00	...	...	1.00

28-Day Compressive Strength in MPa (psi)	Water-cement ratio by weight	
	Non-Air-Entrained	Air-Entrained
41.4 (6000)	0.41	-
34.5 (5000)	0.48	0.40
27.6 (4000)	0.57	0.48
20.7 (3000)	0.68	0.59
13.8 (2000)	0.82	0.74

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	Mixing Water Quantity in kg/m³ (lb/yd³) for the listed Nominal Maximum Aggregate Size							
Slump	9.5 mm (0.375 in.)	12.5 mm (0.5 in.)	19 mm (0.75 in.)	25 mm (1 in.)	37.5 mm (1.5 in.)	50 mm (2 in.)	75 mm (3 in.)	100 mm (4 in.)
Non-Air-Entrained								
25 - 50 (1 - 2)	207 (350)	199 (335)	190 (315)	179 (300)	166 (275)	154 (260)	130 (220)	113 (190)
75 - 100 (3 - 4)	228 (385)	216 (365)	205 (340)	193 (325)	181 (300)	169 (285)	145 (245)	124 (210)
150 - 175 (6 - 7)	243 (410)	228 (385)	216 (360)	202 (340)	190 (315)	178 (300)	160 (270)	-
Typical entrapped air (percentage)	3	2.5	2	1.5	1	0.5	0.3	0.2
Air-Entrained								
25 - 50 (1 - 2)	181 (305)	175 (295)	168 (280)	160 (270)	148 (250)	142 (240)	122 (205)	107 (180)
75 - 100 (3 - 4)	202 (340)	193 (325)	184 (305)	175 (295)	165 (275)	157 (265)	133 (225)	119 (200)
150 - 175 (6 - 7)	216 (365)	205 (345)	197 (325)	184 (310)	174 (290)	166 (280)	154 (260)	-
Recommended Air Content (percent)								
Mild Exposure	4.5	4.0	3.5	3.0	2.5	2.0	1.5	1.0
Moderate Exposure	6.0	5.5	5.0	4.5	4.5	4.0	3.5	3.0
Severe Exposure	7.5	7.0	6.0	6.0	5.5	5.0	4.5	4.0

Nominal Maximum Aggregate Size	Fine Aggregate Fineness Modulus			
	2.40	2.60	2.80	3.00
9.5 mm (0.375 inches)	0.50	0.48	0.46	0.44
12.5 mm (0.5 inches)	0.59	0.57	0.55	0.53
19 mm (0.75 inches)	0.66	0.64	0.62	0.60
25 mm (1 inches)	0.71	0.69	0.67	0.65
37.5 mm (1.5 inches)	0.75	0.73	0.71	0.69
50 mm (2 inches)	0.78	0.76	0.74	0.72
75 mm (3 inches)	0.82	0.80	0.78	0.76
150 mm (6 inches)	0.87	0.85	0.83	0.81

Notes:
These values can be increased by up to about 10 percentge for pavement applications.

Maximum size of aggregate (mm)	First estimate concrete weight* (kg/m³)	
	Non-air-entrained concrete	Air-entrained concrete
9.5	2280	2200
12.5	2310	2230
19	2345	2275
25	2380	2290
37.5	2410	2350
50	2445	2345
75	2490	2405
150	2530	2435