QUESTIONS FOR TESTS ON CONCRETE
(Use your group data)

1.
a. You want to compare the workability of two different concretes and use the slump test. You obtain a slump value of 28 cm for both concretes. Name another test method which is more appropriate for these concretes.

b. You want to compare the workability of two different concretes and use the slump test. And you obtain a slump value of 2 cm for both concretes. Name another test method which is more appropriate for these concretes.

2.
a. What is the purpose of employing "slump" test? Briefly explain the procedure of slump test. Explain the meaning of "slump = 15cm" by a figure.

b. What is the purpose of employing "slump flow" test? Briefly explain the procedure of slump flow test. Explain the meaning of "slump flow= 70cm" by a figure.

3. You prepared a mix proportion for concrete and calculated the weights for 1 m^3 concrete as follows:

	Weight (kg)						
	GROUPS						
	1	2	3	4	5	6	7
Cement	350	300	320	380	365	372	345
Course Agg.	800	950	970	925	916	948	1050
Fine Agg.	495	570	620	570	483	526	586
Water	155	145	150	162	160	140	170
Concrete in 8 l. bowl	13,40	16,7	16,4	15,2	16,4	15,0	17,4

By using these values you prepared a trial batch and employing the procedure for the determination of the unit weight of concrete, you measured the weight of concrete in a 8 liter bowl.

a. What is the unit weight of the concrete in kg/m^3 ?
b. Considering that the proportioning is correct, what is the air content of your concrete?
c. What is the yield of the mixture?
d. Remedy your amounts for obtaining a batch of 1m3 concrete?

4. What is the relation between the air content of concrete determined by pressure method and the altitude?

5. Three cylindrical concrete specimens (15cmx30cm) were subjected to compressive load at the end of 7 days. The specimens failed at the following loads:

	Failure Loads (kgf)						
	GROUPS						
	1	2	3	4	5	6	7
P1	35010	42200	37500	27000	32560	33250	29800
P2	34980	43500	36700	26980	33400	31600	30200
P3	36370	42980	38350	26530	34150	34700	31500

Calculate the 7-day strength of the concrete and make an estimation for the 28-day and 90-day compressive strengths of the same concrete for (15 cmx15cmx15cm) cubic specimens.

6. Below figure shows flexure, split cylinder, and direct tension tensile strength (f_{ct}) as a function of compressive strength (f_c).
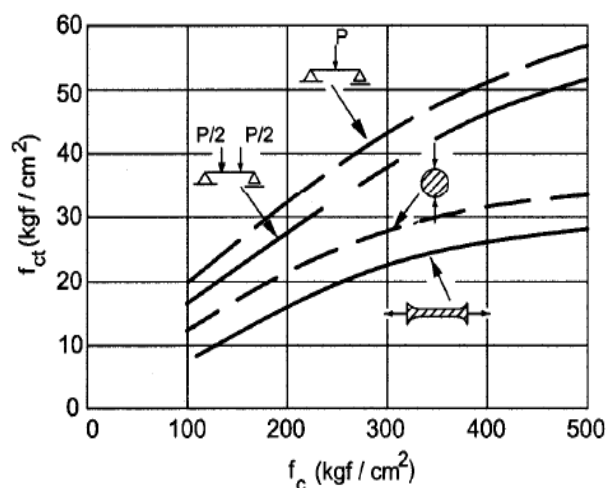
a. Comment on the tensile strengths obtained by testing under three point bending, four point bending, splitting tension and direct tension test. Why are the results of these tests differ for the same concrete?

b. Below table gives compressive strengths at 1, 3, 7, 28 and 90 days. Using the formula $f_{ct}=0,35*(f_c^{0.5})$ plot tensile strength-time graph (MPa-days).

	Failure Loads (*1000 kgf)						
	GROUPS						
DAY	1	2	3	4	5	6	7
1	36	42	12	17	22	32	26
3	135	156	45	62	82	119	98
7	208	240	70	95	125	183	150
28	330	380	110	150	200	290	240
90	390	450	130	178	240	345	285