



Question (3) (20 %):

- Define the elements of wooden formwork using free hand sketches to clarify your answer?
 - What are the different types of formwork from material, statical, movable point of view?
 - State briefly the external parameters that affect the design of formwork?
 - What are the different types of loads and pressures that acting on formwork (roofs or walls) and the factors affecting on each type of load or pressure loads?
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Question (4) (20 %):

- What are the factors govern the equipment selection for specific activity?
 - What are the differences between standard and special equipment give examples?
 - What is meant by- productivity- peak productivity- optimum productivity- swelling factor- losses factor- operation cycle?
 - Specify using free hand sketches the working process of scraper- loader- friction piling machine?
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Question (5) (20 %):

- What are the modern construction technology methods?
- State briefly the advantages and disadvantages of both lift slab and push up construction systems using free hand sketches?
- State briefly the method of statements for both slip form and tunnel form construction systems using free hand sketches?
- Give examples for the most economic modern construction systems within your course study from the following points of view?

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|---------------------|-------------------|
| 1- Constructability | 2- Manoverability |
| 3- Economical | 4- Environmental |
| 5- Productability | 6- Safety |
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Question (6) (20 %):

- What are the responsibilities of the supervisor engineer in both planning and site preparation phases of the construction project?
- What are the differences between specifications, Codes, bill of quantities for construction projects?

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11/1/2017



Open Book Exam

Total Mark (100) degrees

Systematic arrangement of calculations, neat drawings and clear answers are essential.
Any data not given can be reasonably assumed. The exam consists of six questions.

Student must answer one question of (Q1 or Q2)

Question (1) (20 %):

Design the formwork (Sheathing, Joints, Strings, Shores and Bracing) requires for constructing a flat slab with the following information, and check of bearing pressure, and total settlement of forms?

- Slab dimensions	200 ft*100 ft
- Slab bays are	15 ft*15ft
- Height of slab from the ground	= 12ft
- Slab thickness	=12 in.
- Unit weight of concrete is	175 lb/ft ³
- Construction L.L	40 lb/ft ²
- Own weight of forms	=16% of total load
- Wind load (Local code)	=16 lb/ft ²
- Short term load is first	
- Sheathing	(1*4 in)
- Joists	(2*4 in)
- Stringers	(2*6 in)
- Shores	(4*4 in)
- Bracing	(3*3 in)
- Bending stress (F)	=1050 Psi
- Horizontal shear stress (H)	=140 psi
- Compression parallel to grains (C//)	=1100 Psi
- Compression normal to grains (C⊥)	=400 Psi
- Modulus of elasticity (E)	=1500000 Psi

Question (2) (20 %):

For a high speed train from Cairo to Alexandria the total distance is about 220 km if prestressed reinforced concrete sleepers are used to construct the rail way property. The sleeper is 2.4 m long and 0.25 m height and 0.15 m width.

Calculate the total number of sleepers to construct the rail way?

If the productivity of casting sleepers unit are 1000 sleeper/day, calculate the optimum time to construct the rail way property? Concrete trucks can be used to cast the sleepers to achieve the optimum time if each truck is 7 m³ come from 70 km away from the precast unit. Calculate the optimum number of trucks used to cast the sleepers/day?

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