These problems address topics from the NCEES FE Civil CBT Exam Specifications at https://ncees.org/wp-content/uploads/FE-Civil-CBT-specs-1.pdf, see below.

YouTube Playlist

FE Civil Review 2022

Construction Engineering

NCEES Fundamentals of Engineering (FE)
CIVIL CBT Exam Specifications

Effective Beginning with the July 2020 Examinations

Knowledge	Number of Questions
14. Construction Engineering	**8–12**
A. Project administration (e.g., documents, management, procurement, project delivery methods)	
B. Construction operations and methods (e.g., safety, equipment, productivity analysis, temporary erosion control)	
C. Project controls (e.g., earned value, scheduling, allocation of resources, activity relationships)	
D. Construction estimating	
E. Interpretation of engineering drawings	

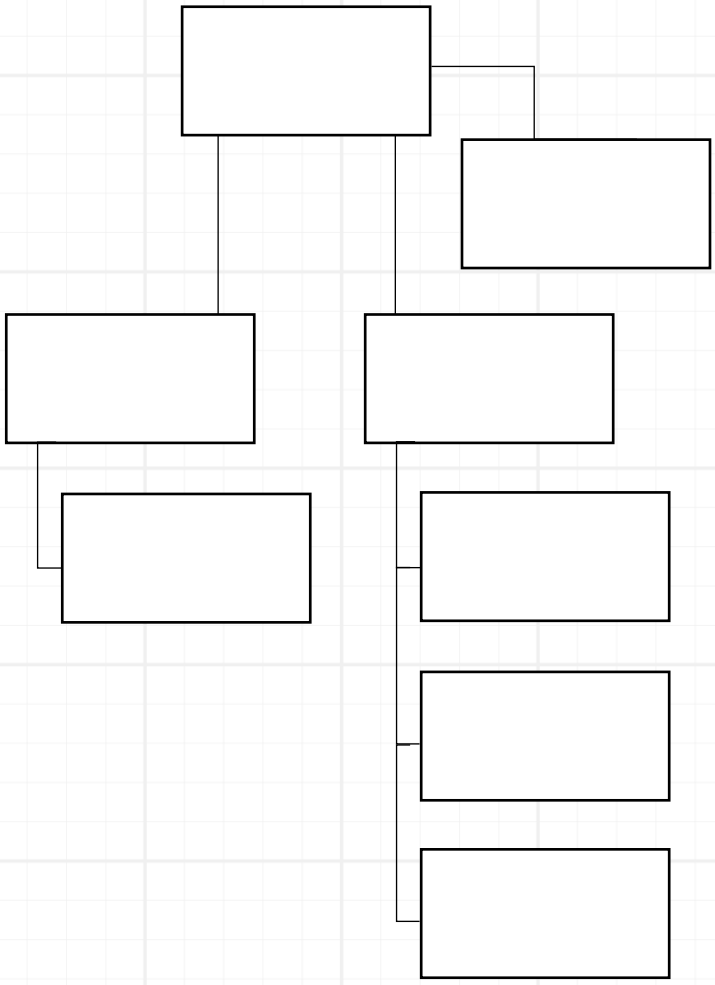
Notes
V1.0 published 4/5/2022
V1.1 updates 4/5/2022

A. Project Administration

Question 1: Shown below is a schematic diagram of a traditional design-bid-build construction project organizational chart and various project parties. The lines represent contractual relationships.

Place the relevant project parties into appropriate positions on the diagram.

Design-Bid-Build Organizational Chart



Project parties:

ENGINEER

INSPECTOR/TESTING AGENCY

CONTRACTOR

OWNER

SUBCONSULTANTS

SUPPLIERS

FABRICATORS

SUBCONTRACTORS

A. Project Administration

Question 2: Various statements related to project delivery methods are provided below. Select **all** that clearly demonstrate an advantage of the **Design-Build** project delivery over the **Design-Bid-Build** approach:

- □ There is single point of contractual responsibility for the Owner for the entire project
- □ There are contractual relationships with the Owner that prevent a conflict of interest
- □ The design is clearly and explicitly defined at the outset of the project
- □ The design includes significant collaboration between the Engineer and the Contractor
- □ The schedule can be fast-tracked and construction can begin before the complete project design is finalized
- □ The Owner will receive a project at the lowest competitive cost

A. Project Administration

Question 3: An indemnification clause in an engineer's design contract is typically tied to:

A. Negligent engineering design
B. Claims submitted by parties affected by a failure
C. Project cost overruns
D. Improper construction methods by the Contractor

A. Project Administration

Question 4: Collusion on a construction project typically refers to which of the following?

A. A practice where multiple contractors conspire to fix prices or rig bids
B. A system where public officials receive money from the contractor after award
C. Falsely increasing the price of change order
D. Misrepresenting the amount of work that has been completed to get advance payments

A. Project Administration

Question 5: A preconstruction conference should be he held:

A. Prior to advertising for bids
B. After advertising for bids but before bids are received
C. After bid opening but before award of the contract
D. After execution of an agreement but before Notice to Proceed

A. Project Administration

Question 6: Types of submittals for engineer approval typically include all the following except:

A. Product data
B. Shop drawings
C. Installation means and methods
D. Mill certificates

A. Project Administration

Question 7: Which of the following statements best define what is meant by "substantial completion" with respect to a construction contract?

A. Project can be used and occupied by the owner and is completely finished
B. Project can be used and occupied by the owner but there is still a punch-list of minor work remaining
C. Contractor's performance bond will be used to finish the remaining work
D. The owner has received a final release of liens from all subcontractors

A. Project Administration

Question 8: A typical amount of retainage on a project is most nearly:

A. 1%
B. 5%
C. 50%
D. 100%

B. Construction operations and methods

Question 9: OSHA requires trench protection systems be installed for the safety of workers:

A. Whenever a trench is dug and workers will be working in the trench
B. For trenches 5 feet deep or greater unless the trench is made entirely in stable rock
C. When the work in the trench will exceed four hours
D. Only if the trench is 8 feet deep or greater or 20 feet long or greater

B. Construction operations and methods

Question 10: The basic responsibility for planning the means and methods of construction is that of the:

A. Owner
B. Inspector
C. Engineer
D. Contractor

B. Construction operations and methods

Question 11: A local iron-worker productivity rate for placement of reinforcement in reinforced concrete foundation walls is 9 hours per ton. A crew consisting of one leader ($38/hour) and three apprentices ($25/hour), with a labor burden of 60% is used to install 45 tons of reinforcing. The total labor cost is most nearly.

A. $11,400
B. $18,300
C. $27,500
D. $45,800

B. Construction operations and methods

Question 12: Best management practices for temporary erosion and sediment control include which of the following? Select **all** that apply:

- □ silt fence
- □ check dams
- □ vortex valves
- □ mulching
- □ concrete washout stations
- □ stormwater wetlands

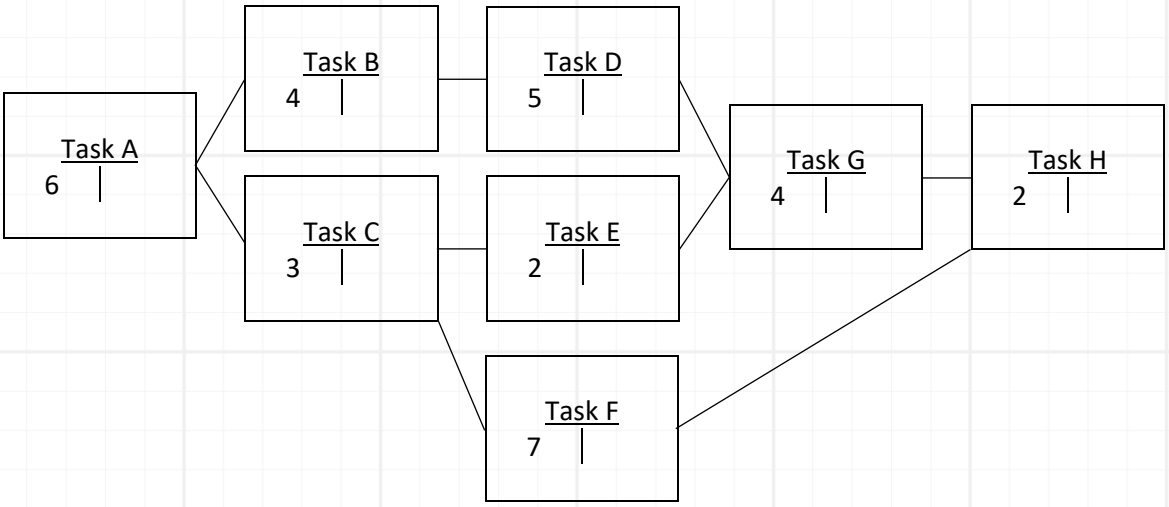
B. Construction operations and methods

Question 13: An excavator with a 1.5-yd^3 bucket is used to remove material at a site. Three trucks with a 12-yd^3 capacity are used to haul the soil to a spoil location that takes 14 minutes to dump the material per trip (plus the time to load the truck). Assuming the excavator can load at a rate of 2-yd^3/minute, the ideal productivity of this system in yd^3/hour is most nearly:

A. 102
B. 108
C. 112
D. 120

C. Project controls

Question 14: An activity on node schedule is shown below with tasks and activity durations in days identified. The duration of the critical path in days is most nearly:



A. 15

B. 18

C. 21

D. 26

C. Project controls

Question 15: A land development project is scheduled on a weekly basis as shown below. The budgeted costs, incurred costs and percent complete after the first four weeks is provided in the table.

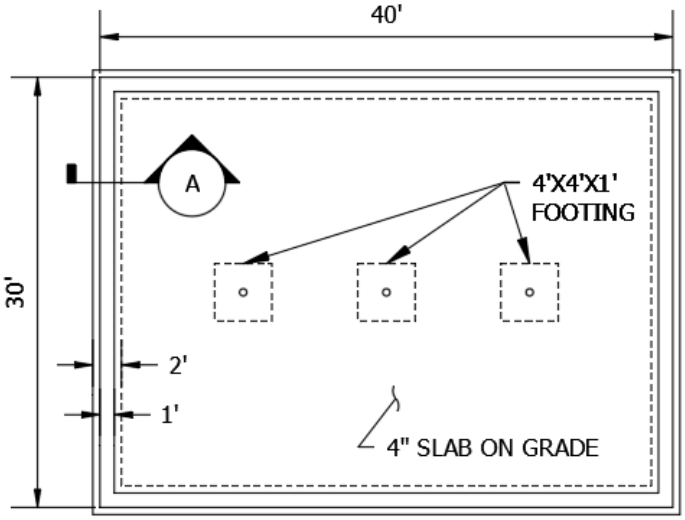
Activity	Budgeted Cost	Incurred Cost	% Complete	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Mobilization	$2,000	$2,000	100%								
Erosion and Sediment Controls	$4,000	$5,000	100%								
Tree Removal	$22,000	$20,000	100%								
Clearing	$18,000	$15,000	75%								
Grading	$44,000	$22,000	50%								
Stabilization	$8,000	$0	0%								
Demobilization	$1,000	$0	0%								

At the end of the first four weeks, which statement best describes the budget and schedule?

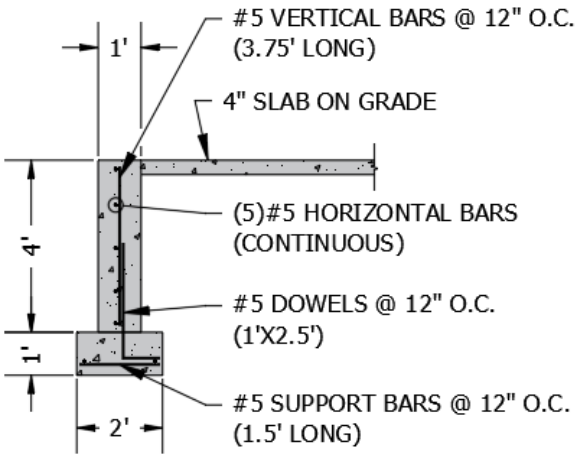
A. The project is **over-budget** and **behind schedule**
B. The project is **under-budget** and **behind schedule**
C. The project is **over-budget** and **ahead of schedule**
D. The project is **under-budget** and **ahead of schedule**

D. Construction estimating

Question 16: Consider the foundation plan and section below.



FOUNDATION PLAN



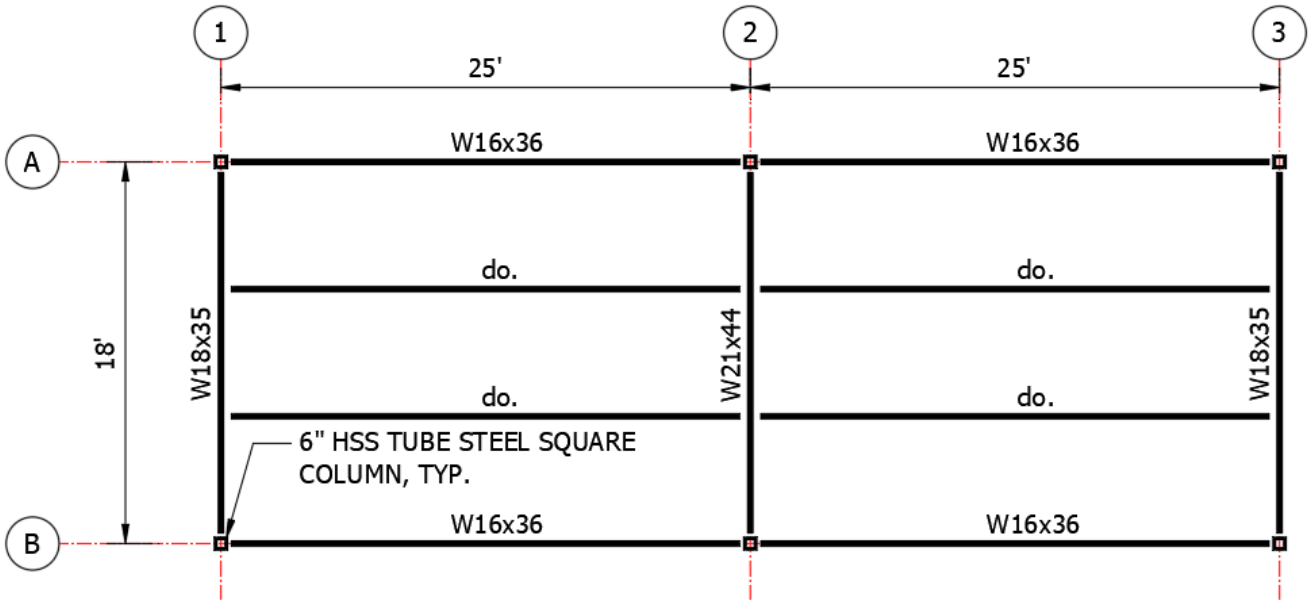
FOUNDATION SECTION A

The total volume of concrete required to construct this foundation (do not include waste) in cubic yards is most nearly:

A. 43
B. 45
C. 47
D. 49

D. Construction estimating

Question 17: Consider the steel framing plan below.



The total weight of steel required for the girders and beams in this plan in tons is most nearly:

A. 4.6
B. 5.4
C. 9.2
D. 10.8

E. Interpretation of engineering drawings

Question 18: If there is a conflict or discrepancy in the construction documents, which of the following is typically given priority:

A. General Conditions of the Contract
B. Construction Drawings
C. Specifications
D. Project Addenda

E. Interpretation of engineering drawings

Question 19: The authority to make design changes to signed and sealed construction drawings can legally be exercised by which of the following persons? Check **all** that apply.

□ Owner's contract administrator
□ Inspector
□ Architect
□ Engineer
□ Contractor
□ Code enforcement official

E. Interpretation of engineering drawings

Question 20: A detail is drawn at a scale of ¾" = 1'-0". If an area measures 3-5/8 inches by 2 inches on paper, the actual area enclosed by these dimensions in square feet is most nearly:

A. 5.4
B. 7.3
C. 9.7
D. 12.9