



Final Exam

Name: _____

Date: _____ Score: _____

Course Title: Capstone
Course Number: BCN4709C

Please circle the letter(s) that corresponds to the correct answer(s) to each question or write your answer in the space provided.

1. Contractors are required under OSHA rules to:
 - a. Hire an outside expert to inspect job sites every two months
 - b. Comply with OSHA construction standard CPR 1926
 - c. Designate a competent person to regularly inspect the health and safety of job sites
 - d. Hire only labor employees who have an OSHA background

2. How much current would a 100 watt light bulb draw if it was connected to a 120VAC source?
 - a. 0.83 amps
 - b. 1.2 amps
 - c. 100 amps
 - d. 120 amps

3. The main parts of a typical water supply system include all of the following except:
 - a. Building Main
 - b. Cleanout
 - c. Building Supply
 - d. Riser

4. A complete set of construction drawings and specifications of the HVAC system is needed to convey design information to the contractor. Which of the following is not required as a component of these drawings?
 - a. Ventilation data, ductwork, and equipment
 - b. Energy conservation equipment data
 - c. NPSH data
 - d. Installation of ducts, including supports and hangers

5. Labor Burden is comprised of several basic costs. Which of the following is one of these basic burden cost-centers?
 - a. Average hourly rate
 - b. Workers Compensation Insurance
 - c. 401K Program
 - d. Health Care Insurance

6. A major consideration when developing a start-up plan for a construction building company is to determine the amount of capital needed. Which of the following guidelines is the best from those described below:
 - a. \$100,000 for each project
 - b. One year of projected gross sales
 - c. Credit line of \$10,000
 - d. Four months coverage of total overhead, including owner's pay

7. Several factors affect the compaction of soil. These can be categorized as moisture content, compaction effort, and _____ .
- a. type of soil
 - b. gravel content
 - c. type of sub-surface
 - d. dry unit weight
8. What is the term for the pressure that creates water flow between two subsurface points?
- a. constant of proportionality
 - b. static head
 - c. net positive suction head
 - d. hydraulic head
9. If a vertical load of 1 ton is applied to a column of 1 square foot cross-sectional area, and the column rests directly on the soil surface, the vertical pressure exerted by the column onto the soil would be _____ on average.
- a. 1 ton per cubic yard
 - b. 2000 ft/lbs
 - c. 1 ton
 - d. 1 ton per square foot
10. Central Air Conditioning consists of heating and cooling components. The size of the cooling unit is rated according to its cooling capacity. What is this rating?
- a. CFM
 - b. Cubic feet/Hr.
 - c. BTU/Hr.
 - d. Calories cubic feet/Hr.
11. Precedence diagramming method (PDM) is known as _____ .
- a. AOA
 - b. AON
 - c. Activity description
 - d. Gnat Chart Scheduling
12. Computerized construction scheduling reduces the time needed to develop and modify the network and insures that fewer mistakes are made in updating the network diagram. What is the major disadvantage of using computerized scheduling?
- a. cost
 - b. portability
 - c. not user friendly
 - d. time for learning and training on the program
13. All of the following are basic components of a safety program except:
- a. A management policy statement
 - b. Conflict resolution programs
 - c. Emergency action plans
 - d. A policy on alcohol and drug abuse
14. A contractor's accident experience has a major effect on costs, and especially the cost of insurance. Which of the following is the principal measurement used to establish the insurance rates?
- a. Hours worked without an accident
 - b. Number of lost-time accidents per month
 - c. Experience Modification Rate (EMR)
 - d. Number of fatal accidents per year

15. All lines on a drawing should have significance. This significance varies, and it should be reflected by the _____.
- a. font size
 - b. line color
 - c. line spacing
 - d. line width
16. When the rotation and the inclination of the planes result in a drawing with three equally divided angles about a center point, the principle of consideration of construction is known as:
- a. centroid
 - b. 3-D
 - c. isometric
 - d. axonometric
17. The three basic types of foundations are: full-basement, crawl space, and _____.
- a. pier support
 - b. footing support
 - c. slab-on-grade
 - d. spread footings
18. The ethics theory that centers on the notion of a contract among those involved in any process is _____.
- a. deontological
 - b. categorical imperative
 - c. Ross's Theory
 - d. Contractarian
19. Standards that are to govern the work of construction professionals are often written into 'codes and professional ethics'. Such codes place a _____ level of ethical conduct and behavior than ordinary morality.
- a. equal
 - b. lower
 - c. different
 - d. higher
20. The true tensile strength of concrete is difficult to determine. One common approach is to use the maximum tensile bending stress in a plain concrete test beam at failure. This is called _____.
- a. split-cylinder test
 - b. applied load of splitting
 - c. modulus of rupture
 - d. cracking moment
21. Web reinforcement is a term used to describe the addition of steel reinforcement to _____.
- a. Increase the tensile nature of concrete
 - b. counteract diagonal tension points
 - c. increase the load bearing capacity of columns
 - d. eliminate the negative moments inherent in concrete beams

22. QM estimates are developed for all subcontracted work. These estimates can be prepared by making simplified Quantity Take-Offs (QTO's) and applying either assembly costs or _____.
- a. published references for costs
 - b. work packages from similar projects
 - c. unit prices per square foot of building floor area C
 - d. ratios for labor vs. material costs
23. A construction project has four principal phases. The _____ phase includes the conceptual planning and schematic design.
- a. construction
 - b. resources allocation
 - c. pre-construction
 - d. mobilization
24. Construction contracts normally include five (5) sections. Which of the following is not one of these?
- a. The Plans
 - b. The Specifications
 - c. The Schedule of Values
 - d. The General Conditions
25. The pricing of work follows the quantity take offs. In order to apply accurate costs, the estimator must know the capability of equipment, crew sizes and make-up, and the planned approach to building the project. This information comes from the _____.
- a. planned project schedule
 - b. architect's design
 - c. plans and specifications
 - d. labor and material costs
26. A Safety and Health policy does not prevent accidents unless:
- a. Owners of projects demand a safety plan for onsite work
 - b. Contractors are trained to 'spot' potential hazards
 - c. Employees accept it
 - d. OSHA fines companies that have submitted unacceptable plans to OSHA
27. There are three basic units to describe electricity. They are voltage, resistance and _____.
- a. charge
 - b. discharge
 - c. ohm's
 - d. amperage
28. Competitive bidders begin receiving revenues _____ than design-build firms.
- a. sooner
 - b. later
 - c. at the same time
 - d. higher
29. Soil tests are more reliable than laboratory tests for determining soil _____.
- a. compaction potential
 - b. permeability
 - c. seepage
 - d. porosity

30. There are several modes of transferring heat (thermal energy). Which of the following is not one of these modes?
- Convection
 - Conduction
 - Expansion
 - Radiation
31. What is the voltage most commonly found in a single-family dwelling?
- 120 VDC
 - 120/240 VAC, 1 phase
 - 120/240 VAC, 3 phase
 - 120/208 VAC, 3 phase
32. Where should the neutral and grounding conductors be connected together in a single-family dwelling?
- only at the utility transformer
 - only at the main panel board
 - at the main panel board and any sub-panel boards in the dwelling
 - at each receptacle
33. Linear scheduling is most appropriate when projects have a large number of _____ activities.
- difficult
 - costly
 - repetitive
 - linked
34. The 'Burgess Method' is a way of leveling _____ resources.
- capital
 - labor
 - material
 - multiple
35. The end objective of an accident investigation and data analysis is to _____.
- blame the person for the accident
 - fine those responsible for the accident
 - report the findings to OSHA
 - find the cause and fix it
36. There are a number of types of project delivery. The most common form is the _____ project.
- design-build
 - bid
 - negotiated
 - lump-sum
37. Whose law states that the volume of gas varies inversely with the absolute pressure, as long as the temperature remains constant?
- Charles'
 - Boyle's
 - Newton's
 - Dalton's

38. Pressure in ductwork is expressed in which of the following?
- inches of water column
 - Psig
 - Pia
 - Inches of Hg.
39. The _____ is not considered a type of reinforced concrete column.
- tied
 - spiral
 - pedestal
 - composite
40. ACI stands for _____.
- American Concrete Inspectors
 - American Concrete Institute
 - American Counsel Institute
 - American Code Inspectors
41. ROM's are _____.
- rough order of magnitude estimates
 - rough option magnitude schedules
 - relative order of magnitude estimates
 - roll over magnitude estimates
42. The term _____ is used to indicate the size of a common nail
- plain
 - finishing size
 - penny
 - style
43. A _____ is used to display natural gas and propane gas pressures during installing of gas furnaces and gas burning equipment.
- Inclined Water Manometer
 - U-Tube Water Manometer
 - Digital Electronic Manometer
 - Megohmmeter
44. The bid summary is laid out in five sections. The final section is used for determining _____.
- subcontractor costs
 - markups
 - general condition costs
 - description of self-performed work.
45. Cost control process involves a series of steps. One is the assignment of _____ codes to each element of work in the cost estimate.
- ID's
 - computer cost
 - cost
 - profit
46. The first step in the networking process is to define the _____.
- activities
 - duration
 - work breakdown structure
 - activity sequence

47. The _____ projects the value of work that is scheduled to be involved at the end of each payment period.
- project network diagram
 - project control system
 - schedule of values curve
 - cash flow forecast
48. The most ignored clause in a construction contract is _____.
- the payment clause
 - the bid clause
 - the format clause
 - the change clause
49. The 'tools' of construction laws are:
- the facts
 - the law
 - the contract
 - the owner's input
50. When does an owner pay for unforeseen site conditions?
- never
 - always
 - when a 'spearin' warranty exists
 - if there is a clause in the contract stating the owner will pay.
51. Computer aided drafting and design software programs are currently the norm in creating construction industry drawings. Computers can store graphic information in two ways, vector format and _____ format.
- 3-D
 - linear
 - 2-D
 - Rastor
52. In residential basements, either wood or metal columns can be used under the beams. The columns are usually _____ wooden posts, or round steel columns of 3" or 4" in diameter.
- 4" x 4"
 - 6" x 4"
 - 6" x 6"
 - 12" x 12"
53. Shotcrete is?
- Concrete poured while cold.
 - Concrete pneumatically projected onto a surface at low velocity.
 - Concrete pneumatically projected onto a surface at high velocity.
 - Concrete sprayed onto surfaces as a sealant.
54. Roof drainage systems must be constructed in accordance with the
- plumbing code
 - roof drainage code
 - HVAC code
 - Hurricane code requirements

55. The floor plan
- also serves as a key to all drawings except engineer drawings
 - also serves as a key to all other drawings
 - can also serve as a utility plan
 - also shows the MSL of the various points of a building site
56. The 'bound set' of bidding documents is referred to as _____ .
- the boilerplate documents
 - the project manual
 - bid document package
 - simple bid documents
57. A 'square' of roofing covers _____ .
- 144 square feet
 - 120 square feet
 - 100 square feet
 - 80 square feet
58. With respect to accessible toilet facilities in commercial buildings, they must in addition to building local codes, also comply _____ .
- with the ADA act.
 - with the CCD act.
 - with the federal design act
 - with the state building codes.
59. There are two principal classification systems used in the U. S. for classifying specific types of soils. Which of the following is one of those systems?
- AASHTO
 - AWWA
 - ASTM
 - ASSE
60. Who is responsible for designing a building, and preparing the drawings and written documents from which the building will be constructed?
- the owner
 - the architect
 - the plan reviewers
 - the construction management firm
61. Question: _____ refers to the soil's ability to resist sliding along internal surfaces within a mass of soil?
- Internal strength
 - Angle of internal friction
 - Strain strength
 - Shear strength
62. The wind chill index is based on what combined forces?
- Wind velocity and air (dry-bulb) temperature.
 - Airflow and heat exchange.
 - Air velocity and heat transference (BTU's) lost)
 - Rate of airspeed times humidity.

63. Heat flow (BTU/hr) is expressed as _____ .
- the ratio of heat transference to heat (gain/loss)
 - airflow x % humidity x BTU's released
 - airflow x load x heat/cooling coefficient of thermal conductivity
 - mass flow x specific heat x temperature difference
64. Refrigerants 'transfer heat' (cooling) by changing phase from 'what to what'?
- compression to evaporation
 - liquid to vapor
 - vapor to condensation
 - liquid to condensation
65. Question: _____ is a term used in construction to describe quantities of earth either excavated from areas or filled into low spots.
- profile layout
 - Earthwork
 - Cross section
 - Cut and fill
66. The amount of light required in units are expressed in _____ .
- fc
 - cu
 - lf
 - li
67. Which of the following statements is true about 'implied warranties'?
- they are established by custom
 - they are established by law
 - they are established by contract only
 - they are unenforceable
68. What types of issues do arbitrators decide?
- a. legal issues only
 - factual issues only
 - all issues
 - non-legal issues only
69. To 'crash' a project is to _____ .
- abandon it
 - shorten it
 - lengthen it
 - milestone it
70. Which of the following legal forms of business organization is perpetual?
- Partnerships
 - Corporations
 - Sole-Proprietorships
 - None are
71. Which of the following terms is used to describe the unofficial/informal relationship established between two workers in two different departments?
- Matrix
 - Gangplank
 - Leadership
 - Poled relationships

72. What type of contractual arrangement could be used when quantities of work are difficult to determine in advance, and yet could still provide competition?
- a. Unit price
 - b. Single fixed price
 - c. Cost plus fixed fee
 - d. Cost plus a percentage
73. What bond requirement requires that the contractor will accomplish the work contracted?
- a. Bid bond
 - b. Performance bond
 - c. Payment bond
 - d. Lien bond
74. Overhead burden is the greatest on which of the following cost categories?
- a. In house materials
 - b. In house equipment
 - c. In house labor
 - d. Does not change
75. Project schedules are necessary tools to control what components of construction projects?
- a. Costs
 - b. Quality
 - c. Time
 - d. All the above
76. Which of the following is the name for the technique of preventing disputes from arising on a project?
- a. Partnering
 - b. TQM
 - c. Mediation
 - d. Dispute resolution
77. An OSHA fine is best described as what type of cost?
- a. Insurance
 - b. Liability
 - c. Public relations
 - d. Penalty
78. Eminent Domain is the right of a government to take private property and use it for _____.
- a. private use
 - b. public use
 - c. Private use if a government unit passes legislation to authorize it.
 - d. Commercial private projects
79. The three basic elements that make up labor costs are:
- a. wages, overtime, and fringe benefits
 - b. wages, overtime, and payroll taxes
 - c. wages, fringe benefits, and payroll taxes
 - d. payroll taxes, fringes, and overtime

80. 'Darcy's Law' is:
a. a measurement formula
b. analysis of particles in soil
c. quantitative analysis of water flow
d. quantitative analysis of sewer flow
81. Stress distribution in soil is important to engineers _____
a. with respect to stability analysis only
b. to determine pressure below a spread out load
c. to determine if the theory of elasticity can be calculated
d. with settlement analysis of foundations
82. Site selection and financing are the responsibility of _____
a. the designer
b. the construction project manager
c. the site-subcontractor
→ d. the owner
83. The three E's of a safety program are:
a. Education, Education, and Education
→ b. Education, Enforcement, and Excellence
c. Enforcement, Engineering, and Education
d. Engineering, Enforcement, and Employee acceptance
84. The 'Human Factors' theory of accident causation attributes accidents to a chain of events _____
a. caused by human error
→ b. caused by unsafe working conditions
c. caused by unforeseen hazards
d. caused by unsafe equipment
85. In most states workers compensation insurance is compulsory unless _____
a. a company is placing sufficient reserves to cover claims
b. an employer posts a bond to cover claims
c. a company goes out of business
d. a state allows exceptions
86. A building code is a local ordinance that establishes the _____ requirements for design, construction, use, renovation, alteration and demolition of a building.
a. maximum
b. average
→ c. minimum
d. greatest
87. At least two types of conductors are required to deliver alternate current in a building's electrical system. A third conductor is added to most circuits called _____
a. a neutral conductor
→ b. a grounding conductor
c. a hot conductor
d. a live conductor

88. A collection of flow lines intersecting equipotential lines constitute a flow net. This is a useful tool in calculating _____ .
- hydraulic pressure
 - flow lines
 - seepage
 - soil permeability
89. The theory of elasticity assumes that stress is proportional to _____ .
- load
 - depth
 - permeability
 - strain
90. Retaining structures are built for the purpose of holding back a _____ .
- backfill
 - soil mass
 - reinforced earth
 - flood
91. In construction, heavy rollers are used to:
- compact soil
 - grade soil
 - level soil
 - stratified soil
92. What electrical building code is the basis for most local building codes?
- NEMA
 - ABYC
 - ANSI
 - NEC
93. Which of the following smoke detectors is the most sensitive?
- Ionization
 - photoelectric
 - air sampler
 - fusible alloy
94. Once prepared, a schedule must be updated regularly by using a well-defined procedure. A _____ or reality check of the schedule must always be made before an updated schedule is accepted.
- quality
 - validity
 - early finish
 - early start
95. Training in emergency action plans for a construction site should be provided to employees upon initial assignments and repeated _____ .
- weekly
 - monthly
 - when the plan changes
 - yearly

96. Steel reinforcement must be added to concrete beams and slabs if the shear is _____ than the shear strength of the concrete itself.
- more
 - equal or less
 - less
 - longer
97. There are several methods for pricing construction contracts. A _____ contract is used when the specific scope of work is not well defined.
- cost plus fee
 - unit price
 - GPM
 - time and material
98. In the construction industry, what does CPM stand for?
- Construction Project Management
 - Cost Price Markup
 - Critical Path Method
 - Construction Pricing Methods
99. The general information found in front of the specifications document is often referred to as _____.
- the floor detail plan
 - the boilerplate
 - the general specification sheet
 - the introduction spec. sheet
100. The percentage of completion method requires _____.
- the recognition of revenue and profit at the end of a project, based on the percentage that project contributes to the total of all projects underway.
 - the recognition of revenue and profit only throughout the project.
 - the recognition of revenue on a monthly basis throughout the project
 - the recognition of revenue, expense and profit throughout the project

