

SAMPLE

CCC/CCE CERTIFICATION EXAM

One Part

Part A: (70 Points)

Part A has 5 compound questions. After reviewing them completely, answer any two (2) of the Part A questions. Each question is worth 35 points (5 points X 7 multiple-choice sub-sections of each question).

A1 An engineering company was awarded a project with an original budget of 160,000 hours, valued at \$15,000,000. The Client has asked the project to prepare an in-depth analysis of the project performance and make a formal presentation.

Use the following data to prepare the reports and presentation as requested by the Client.

Planned hours	65,000
Actual hours spent to date	73,000
% complete	40%

A.1.1 What many hours have the project earned?

- A. 64,000
- B. 73,000
- C. 6,400
- D. 5,900

A.1.2 What is the cost variance (CV)?

- A. - 9,000
- B. + 8,000
- C. - 12,000
- D. +7,000

A.1.3 What is the schedule variance (SV)?

- A. - 1,000
- B. +1,000
- C. - 9,000
- D. + 10,000

A.1.4 What is the cost performance index (CPI)?

- A. .88
- B. 1.14
- C. .98
- D. .89

A.1.5 What is the schedule performance index (SPI)?

- A. .98
- B. 1.01
- C. .89
- D. 1.25

A.1.6 What is the forecast workhours to complete (EAC)?

- A. 181,818
- B. 169,000
- C. 160,000
- D. 183,890

A.1.7 What the status of the project?

- A. Cost favorable, Schedule unfavorable
- B. Cost favorable, Schedule favorable
- C. Schedule unfavorable, Cost unfavorable
- D. Schedule unfavorable, Cost favorable

A2. It is necessary to perform operating and manufacturing cost estimates at both full plant capacity and at conditions other than full plant capacity. An analysis of costs at other than full plant capacity needs to take into account fixed, variable, and semi-variable costs. Answer the following seven (7) questions relating to this scenario.

A2.1 An analysis of operating and maintenance costs at partial capacity enables the determination of:

- A. Variable costs
- B. Fixed costs
- C. Semi-variable costs
- D. Break-even point

A2.2 Those costs that are independent of the system throughput are:

- A. Variable costs
- B. Fixed costs
- C. Operating costs
- D. All of the above

A2.3 Semi-variable costs could include:

- A. Costs that are not directly fixed
- B. Supervision
- C. Plant overhead
- D. All of the above

A2.4 Fixed costs include all of the following except:

- A. Depreciation
- B. Property taxes
- C. Utilities
- D. All of the above

A2.5 Another name for semi-variable costs is:

- A. Proportional costs
- B. Production costs
- C. Manufacturing costs
- D. Packaging costs

A2.6 Royalty cost can be considered as:

- A. Variable costs
- B. Semi-variable costs
- C. Fixed costs
- D. Any of the above

A2.7 An example of a fixed cost is:

- A. Depreciation
- B. General expense
- C. Plant overhead
- D. Material

A3. A construction contractor borrows \$50,000 to take advantage of a 2% cash discount offered on material required for the project. The note is a single note payable in 60 days at an 11% annual interest rate (assumed 365 days). However the contractor receives construction progress payments and applies part of the note as follows:

- A. \$20,000 paid on the note 15 days after the note is made.
- B. \$20,000 paid 30 days from the date of the original note.
- C. \$10,000 balance paid on the maturity date of 60 days.

Assumption: With simple interest, single payment notes, any amount paid on the principal stops the interest paid on that amount as of the date payment is made.

To work this problem you will need to find the total amount of interest paid, how much money the contractor saved by making partial payments on the note, and the percent saved. Use 4 decimal places for all calculations. Answer the following seven (7) questions regarding this scenario. (35 total points)

A3.1 The total amount of interest paid is:

- A. \$452.10
- B. \$451.00
- C. \$904.20
- D. \$902.00

A3.2 How much did the contractor save by making partial payments on the note?

- A. \$451.00
- B. \$452.10
- C. \$226.05
- D. \$225.50

A3.3 The total amount of interest due in 60 days with no partial payments on the note is:

- A. \$904.20
- B. \$656.00
- C. \$657.60
- D. \$902.00

A3.4 What is the percent saved:

- A. 1.8%
- B. 25%
- C. 50%
- D. 24.9%

A3.5 The significance of the assumption in the calculation of this problem is:

- A. Compounding of interest is avoided by making partial payments
- B. The present value of the loan is minimized
- C. The loan can be depreciated earlier by making partial payments
- D. The amount of savings can be increased by the partial payments

A3.6 If the contractor actually paid \$50,000 for job material, how much did he save by taking the cash discount?

- A. \$1,000.24
- B. \$2,000.60
- C. \$1,200.03
- D. \$1,020.41

A3.7 The total saved in interest plus the cash discount is:

- A. \$1,472.51
- B. \$1,451.00
- C. \$1,426.05
- D. \$2,225.50

A4. ABC Valve Company is purchasing a sub-component part from a vendor and is experiencing quality difficulties. Ten percent (10%) of the parts have been defective and rejected. Reworking the part and scrap has averaged \$16 per component. Projected sales over the next two (2) years indicate that 4,000 parts will be required for manufacturing the valves. Engineering has suggested and defined two methods to reduce the risk of questionable parts. Cost of the part will only be borne by the vendor if the parts are rejected upon delivery. Therefore, engineering is proposing either a visual or gauged inspection upon receipt.

Visual inspection would reduce the receipt of defective sub-components by 5%. Labor cost for visual inspection would be \$1,000 per year.

If gauges for testing were purchased for \$1,800, receipt of defective sub-components would drop to 0.5%. Annual Labor cost for gauged inspections would be \$1,700 with a one time training cost of \$600.

Ignore the impact of interest and escalation for the estimated costs. Answer the following 7 questions regarding this scenario. (35 total points)

A4.1 The number of defective components for no inspection, gauged, and visual is:

- A. 200,20,400
- B. 100,10,200
- C. 400,20,200
- D. 200,100,10

A4.2 What is the cost of the gauged inspections not counting rework?

- A. \$4,100
- B. \$5,800
- C. \$6,120
- D. None of the above

A4.3 What is the total cost if no inspections are performed?

- A. \$1,640
- B. \$2,640
- C. \$6,400
- D. None of the above

A4.4 What is the total cost if gauged inspections are selected?

- A. \$5,800
- B. \$6,120
- C. \$4,420
- D. None of the above

A4.5 What is the total cost if visual inspections are selected?

- A. \$4,200
- B. \$1,600
- C. \$5,000
- D. \$5,200

A4.6 What inspection recommendation would you suggest to management?

- A. No inspection
- B. Gauged inspection
- C. Visual inspection
- D. Combination of visual and gauged inspection

A4.7 If used gauges could be purchased for \$1,000 what inspection method would you recommend?

- A. No inspection
- B. Gauged inspection
- C. Visual inspection
- D. Combination of visual and gauged inspection

A5. You are AACEI certified Project Manager on a large long term project with over 200 personnel under your leadership. The project was under funded from the start and problems have developed with schedule slips. Consequently, morale is not the best. Answer the following seven (7) questions regarding communication and ethics. (35 total points)

A5.1 Which of the following is not an essential attribute for communicating with the project personnel?

- A. Your knowledge and understanding of human motives
- B. Your ability to be respected and trusted by peers
- C. Your proficiency with the art of persuasion
- D. Your ability to avoid answering tough questions

A5.2 The following should all be considered before initiating a communication except:

- A. The purpose of the communication
- B. Is the message valid for tomorrow as well as today
- C. Do your everyday actions support your words
- D. None of the above

A5.3 A trade magazine has asked for information to publish a story of the project. Which of the following should not be a guideline for information supplied?

- A. Remain dignified and modest during any interviews
- B. Statements should be objective and truthful
- C. Seek acknowledgement for yourself, and AACEI
- D. Only supply information for which you are qualified

A5.4 Which of the following statements or actions cannot inhibit communications:

- A. Giving insincere praise
- B. Treating a serious problem, seriously
- C. Telling the other person what to do
- D. Psychoanalyzing the other person

A5.5 For written word communication which of the following guidelines does not apply?

- A. Use complete sentences that are short, with short words
- B. Limit each paragraph to a primary and secondary idea
- C. Avoid use of jargon and abbreviations in the document
- D. Have a beginning, middle, and end to the document

A5.6 The best way to improve your verbal and written communication effectiveness is:

- A. Actual practice
- B. Reading technical papers
- C. Video training
- D. Professional assistance

A5.7 Which of the following is not generally true of successful meetings:

- A. Meetings should start and end on schedule
- B. Meetings require preparation, and control
- C. Time should be allowed for extraneous discussion
- D. Minutes are taken and distributed to the attendees

Part B: (30 Points)

Answer all of the following Part B questions. Select only one answer per question. If you select more than one answer per question the question will be marked incorrect. Each question is worth 1.5 points.

- B1. As the purchasing manager for a local company located in the USA, you receive a request from a purchasing manager representing a project buyer overseas for a price quotation for six (6) kilograms (kg) of Babbitt for a project. Babbitt is priced in your firm for \$3.62 per pound. What price would you quote (in US dollars excluding freight) in reply to the request?
- A. \$47.88
 - B. \$21.72
 - C. \$ 4.78
 - D. \$27.15
- B2. The following technique can be used to prepare an Order of Magnitude estimate:
- A. Parametric Estimate
 - B. Monte Carlo Method
 - C. Detailed Takeoffs and Pricing
 - D. All of the above
- B3. Which condition listed below would not enable Liquidated Damages to be applied to a contract?
- A. Delay in the completion of the overall contract
 - B. Loss of revenue for the owner
 - C. Acts of nature
 - D. Unreasonable inconvenience
- B4. What are the six phases of the value study where primary Value Methodology is applied?
- A. Collect User Attitudes, Gather Complete File, Determine Evaluation Factors, Scope the Study, Build Models, Determine Team Composition
 - B. Information, Function Analysis, Creative, Evaluation, Development, Presentation
 - C. Estimate The Costs, Develop Alternatives, Provide User With Alternatives, User Selects Alternatives, Evaluate Alternatives, Implement Alternatives
 - D. Plan; Establish Written Policies; Control Changes; Employ Partnering; Train Managers; Be Selective When Seeking Outcome
- B5. A method of evaluating project or investments by comparing the present value or annual value of expected benefits to the present value or annual value of expected costs is referred to as:
- A. Benefit Cost Analysis
 - B. Net Present Value
 - C. Rate of Return
 - D. Buy Back Analysis

B.6 If you buy a set of baseball cards for \$60.00 and sell them 4 years later for \$90.00, what is the annual rate of return?

- A. 9.5%
- B. 10.7%
- C. 11.4%
- D. 12.3%

B.7 The formula for Schedule Variance (SV) is:

- A. $BCWP / BCWS$
- B. $BCWP - BCWS$
- C. $BCWP - ACWP$
- D. $BCWS - BCWP$

B.8 The formula for Schedule Performance Index (SPI) is:

- A. $BCWP / BCWS$
- B. $BCWP / ACWP$
- C. $BCWS / BCWP$
- D. $BCWS / ACWP$

B.9 Resources that are expended solely to complete the activity or asset is called:

- A. Direct Costs
- B. Indirect Costs
- C. Fixed Costs
- D. Variable Costs

B.10 ABC Computer Company assembles computers in the Atlanta area. Each fully assembled computer sells for \$1,395, it costs ABC Computer Co. \$960 to assemble each computer and ready for shipping. The fixed costs for ABC Computer Co. are \$1,500. What is the break-even point in units for ABC Computer?

- A. 3
- B. 6
- C. 2
- D. 4

- B.11 Design Basis, Planning Basis, Cost Basis, and Risk Basis are all clearly defined in what document?
- A. Estimating Department Guidelines (EDG)
 - B. Contingency and Risk Analysis (C&RA)
 - C. Basis of Estimate (BOE)
 - D. Design Readiness Review (DRR)
- B.12 Influencing the future by making decision based on missions, needs, and objectives is the definition for:
- A. Planning
 - B. Scheduling
 - C. Estimating
 - D. Cost Reporting
- B.13 The _____ through the network determines each activity's ES and EF and the project's duration or the earliest date a project can finish.
- A. Backward Pass
 - B. Coding Techniques
 - C. Forward Pass
 - D. Time-scaled logic diagrams
- B.14 The most complex form of organization structure is the _____ organization.
- A. Functional
 - B. Departmental
 - C. Matrix
 - D. Product-line
- B.15 A Project Controls Professional from Alberta Canada relocates to a job site in south Texas. Upon arrival in Texas, the temperature was recorded at 85 degrees Fahrenheit. Since our Project Controls Professional is accustomed to reading temperatures in Celsius, what would the temperature be in degrees Celsius?
- A. 29
 - B. 95
 - C. 45
 - D. 19

- B.16 To _____ another is to protect them against loss or damage either by paying for the loss or standing in their place in the event of a legal dispute.
- A. Insure
 - B. Indemnify
 - C. Force Majeure
 - D. Audit
- B.17 The two fundamental approaches to cash flow analysis are:
- A. Equivalent Worth, Rate of Return
 - B. Benefit-Cost Ratio, Present Worth
 - C. Future Value, Net Future Worth
 - D. Capitalized Cost, Depreciation
- B.18 _____ is a formal lawsuit in a state or federal court pursuant to the terms of the contract and under the rules of the jurisdiction where the lawsuit is filed.
- A. Mediation
 - B. Litigation
 - C. Arbitration
 - D. Liability
- B.19 According to AACEI “Recommended Practice for Cost Estimate Classification” (AACE 17R-97), the purpose of a Class 3 estimate is:
- A. Control or Bid Tender
 - B. Budget Authorization
 - C. Conceptual Study
 - D. Screening
- B.20 _____ allows activities to be grouped together, which reduces the number of activities in a network and can reduce the overall time of performance.
- A. Overlapping network techniques
 - B. Work breakdown structure
 - C. Project evaluation review technique
 - D. Activity coding techniques

ANSWERS AND SOLUTIONS:

PART A

A.1

A.1.1. A

SOLUTION: Earned value = % complete X budget
 .40 X 160,000 = 64,000 hours earned

A.1.2 A

SOLUTION: $CV = BCWP - ACWP$
 (earned hours – actual hours)
 64,000 – 73,000 = -9,000

A.1.3 A

SOLUTION: $SV = BCWP - BCWS$
 (earned hours – planned hours)
 64,000 – 65,000 = -1,000

A.1.4 A

SOLUTION: $CPI = BCWP / ACWP$
 (earned / actual)
 64,000 / 73,000 = .88

A.1.5 A

SOLUTION: $SPI = BCWP / BCWS$
 (earned / planned)
 64,000 / 65,000 = .98

A.1.6 A

SOLUTION: $EAC = BAC / CPI$
 160,000 / .88 = 181,818

A.1.7 C

SOLUTION:

Cost:	CV = -9000 hours (over budget) CPI = .88 (below 1.0 reflects over budget)
Schedule:	SV = -1,000 hours (slightly behind schedule) SPI = .98 (below 1.0 reflects behind planned)
Earned Hours:	64,000
Actual Hours Spent:	73,000 (spending too many hours and not earning value on all the hours spent to date)
Original Budget:	160,000
Forecast at Complete:	181,818

ANSWER SOURCE: Skills & Knowledge 5, Chapters 14, 15, 16, 17

A.2

A.2.1	D
A.2.2	B
A.2.3.	D
A.2.4	C
A.2.5	A
A.2.6	D
A.2.7	A

ANSWER SOURCE: Skills & Knowledge 5, Chapter 10, Pages 10.1 through 10.24

A.3

A.3.1 A

Solution:

$$\text{INTEREST} = \text{PRINCIPLE} \times \text{RATE} \times \text{TIME}$$

1st \$20,000
payment

$$\$50,000.00 \quad \times \quad 11\% \quad \times \quad (15/365)$$

$$\$50,000.00 \quad \times \quad .11 \quad \times \quad .0411$$

(use 4 decimal places, round up on
5th place if 5 or greater)

\$226.05

2nd \$20,000
payment

$$\$50,000.00 \quad \text{minus } 1^{\text{st}} \text{ payment of } \$20,000 = \$30,000$$

$$\$30,000.00 \quad \times \quad 11\% \quad \times \quad (15/365)$$

\$135.63

\$10,000 final
payment

$$\$10,000.00 \quad \times \quad 11\% \quad \times \quad (30/365)$$

$$\$10,000.00 \quad \times \quad .11 \quad \times \quad .0822$$

(use 4 decimal places, round up on
5th place if 5 or greater)

\$90.42

$$1\text{ST PAYMENT} + 2 \text{ PAYMENT} + 3 \text{ PAYMENT}$$

$$\$ 266.05 \quad \$ 135.63 \quad \$ 90.42$$

\$ 452.10

A.3.2 B

Solution:

$$\text{INTEREST} = P \times R \times T$$

$$\$ 50,000.00 \quad \times \quad 11\% \quad \times \quad (60/365)$$

$$\$ 50,000.00 \quad \times \quad .11 \quad \times \quad .1644$$

(use 4 decimal places, round up on 5th place if 5 or greater)

$$\$ \quad 904.20$$

$$\$ \quad 904.20 \quad \text{minus} \quad \$ \quad 452.10$$

$$\boxed{\$ \quad 452.10}$$

A.3.3 A

Solution:

$$\text{INTEREST} = P \times R \times T$$

$$\$ 50,000.00 \quad \times \quad 11\% \quad \times \quad (60/365)$$

$$\$ 50,000.00 \quad \times \quad .11 \quad \times \quad .1644$$

(use 4 decimal places, round up on 5th place if 5 or greater)

$$\boxed{\$ \quad 904.20}$$

A.3.4 C

Solution:

$$\$ \quad 452.10 \quad \text{divided by} \quad \$ \quad 904.20$$

$$\boxed{50\%}$$

A.3.5 D

A3.6 D

Solution: \$ 50,000.00 Actually paid
2% or (1-.02)

\$50,000 divided by .98

\$ 51,020.41

\$51,020.41 minus \$50,000.00 =

\$1,020.41

A3.7 A

Solution: \$ 1,020.41 saved by cash discount
\$ 452.10 saved in interest
\$ 1,472.51 total saved

ANSWER SOURCE: Skills & Knowledge 5, Chapter 27, Pages 27.1 through 27.7

A.4. answers and solutions to A.4

A.4.1 C

Solution:

No inspection $10\% \times 4000$
400

Gauged $.5\% \times 4000$
20

Visual $5\% \times 4000$
200

A4.2 B

Solution: \$ 1,800.00 + (\$1700 x 2) + \$600 (reminder: labor for 2 years)
\$ 5,800.00

A4.3 C

Solution: $10\% \times 4000 \times \16.00
 $\$ 6,400.00$

A.4.4 B

Solution: $0.5\% \times 4000 \times \16.00
 $\$ 320.00$
 $\$ 5,800.00$ cost of gauged inspections, plus labor and training
 $\$ 6,120.00$

A4.5 D

Solution: $5\% \times 4000 \times \$16.00$
 $\$ 3,200.00$
 $\$ 2,000.00$ (labor for 2 years)
 $\$ 5,200.00$

A4.6 C

Solution:	gauged	\$6,120.00
	Visual	\$5,200.00
	no inspection	\$6,400.00

VISUAL INSPECTION -- MOST COST EFFICIENT

A4.7 C

Solution: $\$ 1,000.00 + (\$1700 \times 2) + \$600$ (reminder: labor for 2 years)
 $\$ 5,000.00$

$0.5\% \times 4000 \times \16.00
 $\$ 320.00$
 $\$ 5,000.00$ cost of gauged inspections, plus labor and training
 $\$ 5,320.00$

VISUAL INSPECTION - STILL MORE COST EFFICIENT

A.5

A.5.1 D

A.5.2 D

A.5.3 C

A.5.4 B

A.5.5 B

A.5.6 A

A.5.7 C

ANSWER SOURCE: Skills & Knowledge 5, Chapter 22, Pages 22.1 through 22.9

PART B ANSWERS:

B.1 A

Solution:

Convert kilograms to pounds

6 kilograms divided by .4535924 = 13.2278 pounds

13.2278 pounds X \$3.62 / pound = \$47.88 for order of Babbitt for this project

ANSWER SOURCE: Skills & Knowledge 5, Appendix B – SI Units, Pages B.1 through B.8

B.2 A

ANSWER SOURCE: Skills & Knowledge 5, Chapter 9, Page 9.1 through 9.35

B.3 C

ANSWER SOURCE: Skills & Knowledge 5, Chapter 25, Pages 25.1 through 25.17

B.4 B

ANSWER SOURCE: Skills & Knowledge 5, Chapter 24, Pages 24.1 through 24.7

B.5 A

ANSWER SOURCE: Skills & Knowledge 5, Chapter 7, Pages 7.1 through 7.7

B.6 B

$$\begin{aligned}\text{Solution: } F &= P (1 + i)^n \\ 90 &= 60 (1 + i)^4 \\ 90 / 60 &= (1 + i)^4 \\ 1.5 &= (1 + i)^4 \\ i &= 10.7\%\end{aligned}$$

ANSWER SOURCE: Skills & Knowledge 5, Chapter 27, Pages 27.1 through 27.7

B.7 B

ANSWER SOURCE: Skills & Knowledge 5, Chapter 14, Pages 14.1 through 14.6

B.8 A

ANSWER SOURCE: Skills & Knowledge 5, Chapter 14, Pages 14.1 through 14.6

B.9 A

ANSWER SOURCE: Skills & Knowledge 5, Chapter 1, Pages 1.1 through 1.9

B.10 A

Solution:

$$\begin{aligned}\text{Selling Price} &= \$1,395 \\ \text{Variable Costs} &= \$960 \\ \text{Fixed Costs} &= \$1,500\end{aligned}$$

$$X = FC / (SP - VC)$$

$$X = \$1,500 / (\$1395 - \$960)$$

$$X = \$1,500 / \$435$$

$$X = 3 \text{ units} \quad (3.45 \text{ actually, round DOWN to whole number – as we are assembling completed computers ready for shipment – can't ship .45 of a computer})$$

ANSWER SOURCE: Skills & Knowledge 5, Chapter 2, Pages 2.1 through 2.5

B.11 C

ANSWER SOURCE: Skills & Knowledge 5, Chapter 9, Pages 9.1 through 9.35

B.12 A

ANSWER SOURCE: Skills & Knowledge 5, Chapter 12, Pages 12.1 through 12.5

B.13 C

ANSWER SOURCE: Skills & Knowledge 5, Chapter 13, Pages 13.1 through 13.19

B.14 C

ANSWER SOURCE: Skills & Knowledge 5, Chapter 19, Pages 19.1 through 19.4

B.15 A

Solution: Convert degrees Fahrenheit to degrees Celsius
 $(5 / 9) (F - 32) = C$
 $.5556 (85 - 32) = C$
85 degrees F = 29 degrees C

ANSWER SOURCE: Skills & Knowledge 5, Appendix B

B.16 B

ANSWER SOURCE: Skills & Knowledge 5, Chapter 25, Pages 25.1 through 25.17

B.17 A

ANSWER SOURCE: Skills & Knowledge 5, Chapter 28, Pages 28.1 through 28.4

B.18 B

ANSWER SOURCE: Skills & Knowledge 5, Chapter 25, Pages 25.1 through 25.17

B.19 B

ANSWER SOURCE: Skills & Knowledge 5, Chapter 9, Pages 9.1 through 9.35

B.20 A

ANSWER SOURCE: Skills & Knowledge 5, Chapter 13, Pages 13.1 through 13.19