

NCARB

PRACTICE EXAM

ARCHITECT REGISTRATION EXAMINATION® 5.0

Practice Management
division



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Question 1

A small firm in the South wins a large waterpark project in the Pacific Northwest. The firm has decided that they will team with a firm based in the Pacific Northwest to deliver the project.

Why should the firm from the South team with the firm from the Pacific Northwest? **Check the four that apply.**

- A. To benefit from the experience of a firm that is more familiar with construction regulations in the project jurisdiction.
- B. To benefit from the experience of a firm that is more familiar with design in the project climate.
- C. To have a team member located close to the project during construction administration.
- D. To increase production capacity during the construction document phase.
- E. To shift project responsibility and liability to the local firm.
- F. To maximize profits for this type of project.

Correct answer: ABCD

CORRECT RESPONSES

To benefit from the experience of a firm that is more familiar with construction regulations in the project jurisdiction.
The Pacific Northwest firm is more familiar with local regulations and how they will impact the project.

To benefit from the experience of a firm that is more familiar with design in the project climate.
The Pacific Northwest firm is more familiar with the local climate and how it will impact the project.

To have a team member located close to the project during construction administration.
Having a team member in close proximity to the project site increases the design team's availability and decreases travel costs.

To increase production capacity during the construction document phase.
The second firm will increase production capacity during the construction documentation phase.

Section: Practice-Wide Delivery of Services

Question 2

Staff Member	Annual Salary
Principal Partner A	\$ 150,000
Principal Partner B	\$ 150,000
BIM Specialist A	\$ 75,000
BIM Specialist B	\$ 75,000
Office Administrator	\$ 50,000
Total Annual Gross Salaries	\$ 500,000

Refer to the exhibit.

An architecture firm completes a project that generates an \$80,000 fee surplus. The partners decide to reward the entire staff by dividing the surplus and issuing bonus checks proportional to the gross salaries of the staff members. All bonus amounts are also gross.

Click on the row in the Bonus Amounts list to indicate the bonus that BIM Specialist B should receive.

Correct answer:

Bonus Amounts	
\$	48,000
\$	24,000
\$	18,000
\$	12,000
\$	8,000

CORRECT RESPONSE
\$12,000

CALCULATIONS

1. The Firm's Total Annual Gross Salaries: \$500,000
2. Annual Salary for BIM Specialist B: \$75,000
3. Proportion of BIM Specialist B's salary of the firm's total annual gross salaries: $\$75,000 / \$500,000 = .15$ or 15%
4. BIM Specialist B will receive 15% of the bonus distribution: $.15 \times \$80,000 = \$12,000$

Section: Finances, Risk, & Development of Practice

Question 3

A principal at an architecture firm works 20 hours per week and has committed 60% of their time to marketing, business development, and management. With growing project work, they have agreed to increase their utilization by eight hours while still maintaining their overall schedule.

What is the principal's new utilization rate after this adjustment in hours? Round to the nearest whole number.

- A. 42%
- B. 57%
- C. 80%
- D. 100%

Correct answer: C

CORRECT RESPONSE
80%

CALCULATIONS

1. Calculate current utilization rate: $100\% - 60\% = 40\%$
2. Calculate direct billing utilization in hours: $40\% \times 20 \text{ hours} = 8 \text{ hours}$
3. Calculate new utilization rate with increase of hours: $(8 \text{ hours} + 8 \text{ hours}) / 20 \text{ hours} = 80\%$

Section: Practice Methodologies

Question 4

A managing principal wants to decrease the utilization of senior design associates in favor of assigning them a greater share of business development. The managing principal is now determining the tasks that should be required of senior design associates in order to align with this redirection of their efforts.

Which of the following should the senior design associates be required to attend? **Check the three that apply.**

- A. Staff meetings
- B. Executive meetings
- C. Consultant sessions
- D. Coordination sessions
- E. Redline work sessions
- F. Project design meetings

Correct answer: ABF

CORRECT RESPONSES

Staff meetings

In-house staff meetings can properly assist in the allocation of resources, which is important for the managing principal and all associates.

Executive meetings

Executive meetings are where the most critical, impactful, and formative decisions are made. The associates should be required to be in attendance at meetings where the most impactful decisions are made.

Project design meetings

Project design meetings are critical meetings where design aesthetics are presented and discussed, requiring the participation of the design associates.

Section: Practice Methodologies

Question 5

Team A	Team B	Team C
<ul style="list-style-type: none">• Prior relationship with client, but no prior relationship with ABC	<ul style="list-style-type: none">• Prior relationship with ABC, but mainly on residential and commercial projects	<ul style="list-style-type: none">• Prior relationship with ABC on other college projects
<ul style="list-style-type: none">• Last project with owner resulted in \$250,000 in construction changes caused by design errors, mainly the fault of the architect	<ul style="list-style-type: none">• Have not worked together in > 2 years and primary principal retired 6 months ago resulting in a reorganization of staffing	<ul style="list-style-type: none">• Last higher education project with ABC, Team C cost the design team \$175,000 in construction changes caused by design errors
<ul style="list-style-type: none">• Extensive experience in higher education projects	<ul style="list-style-type: none">• Some experience in higher education projects, extensive experience in lab design	<ul style="list-style-type: none">• 2 previous higher education projects, both with ABC
<ul style="list-style-type: none">• Designs frequently exceed client's budget and require significant rework	<ul style="list-style-type: none">• Designs routinely meet budget and are well coordinated	<ul style="list-style-type: none">• Designs frequently have coordination issues and require last minute rework
<ul style="list-style-type: none">• Staff is small compared to current workload	<ul style="list-style-type: none">• Adequate staff compared to workload	<ul style="list-style-type: none">• Adequate staff, but significant turnover has occurred in last 6 months
<ul style="list-style-type: none">• 6 design awards for higher education projects	<ul style="list-style-type: none">• Brought RFP to ABC's attention to expand into the market	<ul style="list-style-type: none">• 1 design award for higher education projects (with ABC)
<ul style="list-style-type: none">• Fee: \$400,000	<ul style="list-style-type: none">• Fee: \$300,000	<ul style="list-style-type: none">• Fee: \$200,000

Refer to the exhibit.

ABC Architects is reviewing an RFP for a new science and technology building at a university. Relevant project information follows:

- The building is to have a signature style, anchor the campus, and attract high-caliber students.
- Design teams must have significant experience and a history of award-winning designs.
- There is a 24-month design and construction timeline, and construction is to be fast-tracked, with the building opening in time for fall admissions.
- Total design fee is limited to \$1,000,000.
- Total construction cost is limited to \$10,000,000.

ABC Architects has never worked for the university, but ABC has considerable higher education experience, including five award-winning projects. ABC determines that they will need to partner with a consultant engineering firm in order to respond to the RFP.

With which consultant team should ABC Architects partner?

- A. Team A
- B. Team B
- C. Team C

Correct answer: B

CORRECT RESPONSE

Team B

Team B has experience working with ABC, has experience with the project type, and delivers well-coordinated work on time. While this team does not have a history of delivering award-winning designs, ABC's record of award-winning design and experience is significant, which is more important than the consultant engineer's history of awards.

Section: Business Operations

Question 6

An architecture firm is awarded a project for an addition to an elementary school. Project details follow:

- Negotiated fee percentage: 5%
- Construction budget: \$5,000,000
- Gross fee profit: 10%
- Consultant expenses: 35%

The firm now wants to manage the available architectural fee with the hours required to complete the project.

What is the value of the fee the architect should use in planning these hours?

- A. \$137,500
- B. \$146,250
- C. \$162,500
- D. \$187,500

Correct answer: A

CORRECT RESPONSE
\$137,500

CALCULATIONS

1. \$5,000,000 (construction budget) x 0.05 (negotiated fee percentage) = \$250,000 (negotiated fee)
2. 0.35 (consultant expenses percentage) x \$250,000 (negotiated fee) = \$87,500 (consultant expenses)
3. \$250,000 (negotiated fee) - \$87,500 (consultant expenses) = \$162,500
4. 0.10 (gross fee profit percentage) x \$250,000 (negotiated fee) = \$25,000 (target profit)
5. \$162,500 - \$25,000 = \$137,500 (available architectural fee)

Section: Business Operations

Question 7

An architecture firm wants to increase the business development roles of their project architects. Some of their current activities will be delegated to the administrative support team with project architect oversight.

Which activities should be delegated? **Check the three that apply.**

- A. Development of technical documentation standards and protocols
- B. QA/QC document reviews
- C. Project close-out compilation
- D. MEP design coordination
- E. Construction contract administration tracking
- F. Monitoring of in-house budget against production actuals and percent complete

Correct answer: CEF

CORRECT RESPONSES

Project close-out compilation

Project close-out includes several routine and confirmation-type items that can be reviewed by the PA or PM once delegated.

Construction contract administration tracking

Tracking of change orders, RFIs, submittals, bulletins, and schedules are standardized tasks easily delegated to administrative personnel.

Monitoring of in-house budget against production actuals and percent complete

Monitoring and reporting of actuals versus budgeted project costs is a standardized report which can be flagged to the PA for concerns.

Section: Business Operations

Question 8

An architecture firm wants to hire an architect who will be trusted with several important clients. In exchange for a sign-on bonus, the firm asks the prospective employee to sign a non-compete agreement to protect the firm's interests if the future employee eventually leaves the firm.

Which one of the following clauses is reasonable to include in the non-compete agreement?

- A. Employee agrees to not seek employment with a competing firm located in the same region within 18 months of leaving the firm.
- B. Employee agrees to not solicit clients from the firm for a minimum of six months after leaving.
- C. Employee must stop communications with all clients and consultants upon notification that they intend to leave the firm.

Correct answer: B

CORRECT RESPONSE

Employee agrees to not solicit clients from the firm for a minimum of six months after leaving.

This is a reasonable request that protects the hiring firm's client list and allows them to adequately adjust to the employee leaving their firm.

Section: Finances, Risk, & Development of Practice

Question 9

An architect is reviewing contractor insurance requirements for a new multifamily development.

Which one of the following most appropriately describes the coverage offered by builder's risk insurance?

- A. Coverage if the contractor fails to complete their work.
- B. Coverage if a building system fails within a period of time after construction.
- C. Coverage of damages to the building during the course of construction.
- D. Coverage of any errors or omissions by the contractor.

Correct answer: C

CORRECT RESPONSE

Coverage of damages to the building during the course of construction.

Builder's risk is designed to cover losses or damage to the property or construction materials occurring during the construction period on site.

Section: Business Operations

Question 10

A municipality hires an architecture firm to provide construction documents for a new public library. The firm has completed 35% of the design and has seven months to deliver a 95% set for bidding, per the contract.

The municipality notifies the firm that they need to accelerate the bid schedule by four months in order to have an accurate cost for the next municipal budget submission. The firm needs to maintain a good working relationship with the municipality without increasing risk to the firm.

Which of the following responses meet the needs of both the firm and the municipality? **Check the two that apply.**

- A. Negotiate with the municipality to provide a bid set at 65% design completion on the accelerated schedule and recommend that contractors bid the project as cost-plus.
- B. Negotiate with the municipality to provide a bid set at 65% design completion and recommend the contractors bid the project as a guaranteed maximum price.
- C. Accelerate the design to meet the new bid schedule only if the municipality agrees to waive the firm's liability should the acceleration result in errors and omissions.
- D. Accelerate the design schedule by hiring two additional staff members to complete the bid set as requested.
- E. Decline to change the 95% submission schedule and provide a 35% estimate to the municipality.
- F. Send the municipality a request for additional services to hire a third-party cost engineer who will perform a cost estimate at 65% design.

Correct answer: BF

CORRECT RESPONSES

Negotiate with the municipality to provide a bid set at 65% design completion and recommend the contractors bid the project as a guaranteed maximum price.

Bidding a 65% set is feasible, and GMP will ensure the bids are accurate enough for the budget submission.

Send the municipality a request for additional services to hire a third-party cost engineer who will perform a cost estimate at 65% design.

This responds to the client's request without adding risk to the architect.

Section: Practice-Wide Delivery of Services

Question 11

Available Staff	Hourly Rate	Current Utilization Rate
Project Architect A	\$150	37.5%
Project Architect B	\$100	25%
Project Manager O	\$100	60%
Draftsman	\$30	95%

Refer to the exhibit.

An architecture firm is working on a new office project. After submitting the construction documents, the client requests an increase in the number of flexible workstation areas. The firm expects the change to require five weeks at 40 hours per week. The total amount for the change order is \$20,000.

Which staff member should be assigned to this project to stay within budget?

- A. Project Architect A
- B. Project Architect B
- C. Project Manager O
- D. Drafter

Correct answer: B

CORRECT RESPONSE
Project Architect B

Project Architect B has the lowest utilization rate of the staff and can complete the work within the budget.

CALCULATIONS

1. 5 weeks x 40 hours = 200 hours to complete the task
2. \$100 (Project Architect B's hourly rate) x 200 hours = \$20,000 (within budget)

Section: Business Operations

Question 12

A local school board contracts an architecture firm to design and document renovations to two wings of an existing high school building. The contract calls for a design fee of \$500,000 with the following distribution:

- Schematic Design: 15%
- Design Development: 25%
- Construction Documentation: 35%
- Permits and Bidding: 5%
- Construction Administration: 20%

The firm completes the design development phase when the school board informs them that, due to funding, the project will need to be constructed in two phases. Each construction phase will cover only one of the wings, will start in May and finish in September, and will need to be bid and permitted before each phase begins.

What additional fee should the architecture firm request from the school board?

- A. \$25,000
- B. \$100,000
- C. \$125,000
- D. \$300,000

Correct answer: C

CORRECT RESPONSE
\$125,000

Construction Documentation will not change because the renovation areas are already separated. Both the Permits and Bidding and the Construction Administration phases will need to be completed twice.

CALCULATIONS

1. 5% (Permits and Bidding) x \$500,000 (design fee) = \$25,000
2. 20% (Construction Administration) x \$500,000 (design fee) = \$100,000
3. \$25,000 (for Permits and Bidding) + \$100,000 (for Construction Administration) = \$125,000 additional fee request

Section: Practice Methodologies

Question 13

A firm that specializes in senior housing is contacted by a developer who wants to build 50 townhouses for residents over 55 years old. The developer is asking for a fee proposal to provide the overall preliminary design as well as construction documents for all the units. Project details follow:

- The project will be permitted and constructed in five phases.
- The project will be built in clusters of four-, five-, and six-townhouse units.
- The units will have three-, four-, and five-bedroom options.
- Unit distribution will be determined by sales.

The firm wants to make sure that their fees capture the value of their expertise as well as maximize cash flow and profit.

Which fee proposal structure is most appropriate?

- A fixed fee for the preliminary design and a fixed fee per unit for the construction documents, based on the number of units in each phase.
- A fixed fee for the preliminary design, a fixed fee for the construction documents for each unit type, and a reuse fee for all subsequent units.
- A time and materials fee for the preliminary design and a fixed fee per unit for the construction documents, based on the number of units in each phase.
- A time and materials fee for the preliminary design, a fixed fee for the construction documents for the first phase, and a reuse fee for all subsequent phases.

Correct answer: B

CORRECT RESPONSE

A fixed fee for the preliminary design, a fixed fee for the construction documents for each unit type, and a reuse fee for all subsequent units.

A fixed fee for the preliminary design is an efficient compensation method and appropriately compensates for the architect's expertise; the fixed fee for the construction documents for each unit type also efficiently covers the cost of the base construction documents; and the reuse fee is a fair way to compensate for repetitive use.

Section: Practice-Wide Delivery of Services

Question 14

An owner and architect contractually agree that construction costs are not to exceed a specified amount. However, several cost overruns occur during construction. The owner holds the architect responsible, but the architect disagrees, claiming they provided fully contractual, professional services consistent with the legal standard of care. The owner and architect agree to resolve the dispute through arbitration.

Which one of the following arbitration rulings should the architect expect?

- The architect has provided services consistent with the professional skill and care ordinarily provided in the same or similar locality under the same or similar circumstances.
- The architect has failed to provide services agreed upon by both parties in their written agreement, which exceeded the professional skill and care ordinarily provided.
- The architect has provided services consistent with the professional skill and care ordinarily provided, and that the architect had no control over the increase in construction cost.

Correct answer: B

CORRECT RESPONSE

The architect has failed to provide services agreed upon by both parties in their written agreement, which exceeded the professional skill and care ordinarily provided.

The architect expanded the standard of care in the written agreement with the owner to include a guarantee of the maximum construction cost, which exceeds the professional skill and care ordinarily provided. Because the architect was unable to uphold their contractual obligation, the architect should expect the arbitrator to rule in favor of the owner.

Section: Business Operations

Question 15

An architecture firm has started annual performance reviews for their employees. A minimum utilization rate of 75% for each architect is required to maintain profitability. The office manager is meeting with Architect A to review their efficiency.

Which of the following activities should Architect A highlight as a billable task? **Check the two that apply.**

- Redlining of a project.

- B. Designing a project booklet for a prospective client.
- C. Developing an innovative rain-screen detail for a project.
- D. Writing an architectural services RFP response for a project.
- E. Developing a continuing education seminar on healthcare design.
- F. Coordinating the new office furniture delivery for the architect's office.

Correct answer: AC

CORRECT RESPONSES

Redlining of a project.

Redlining drawings is a billable task to the client.

Developing an innovative rain-screen detail for a project.

Generating construction details is a billable task to the client.

Section: Finances, Risk, & Development of Practice

Question 16

ABC Architects and their consultant team have been working on a project for several weeks. The construction documents were completed on the afternoon of the project deadline. During the submittal of documents to the AHJ, several electrical outlets are found to be missing in the engineer's drawings in locations required by code. ABC Architects is unable to reach the electrical engineer. ABC Architects must consider the following variables:

- The client has set a hard deadline with possible damages if missed.
- The AHJ requires all submissions to be two sets of wet, stamped plans submitted in person at the building department.
- The AHJ technician will allow the architect to add the missing outlets by hand on the plans with a red pen.
- The architect used an AIA B101 with the project owner.
- The architect used an AIA C401 with the consultant team.

How should ABC Architects handle this situation?

- A. Make the changes to the drawings by hand to ensure the deadline is not missed and notify the engineer the next day.
- B. Request that the engineer update the drawings and prepare for submission the next day.
- C. Call the owner and request written approval to modify the drawings by hand because they own the documents being submitted.

Correct answer: B

CORRECT RESPONSE

Request that the engineer update the drawings and prepare for submission the next day.

The engineer must make their own corrections or provide written consent otherwise.

Section: Practice-Wide Delivery of Services

Question 17

An architecture firm is awarded a 10-story condominium project located in a downtown metropolitan area. The firm's project manager is in the process of assigning an architect to the project. The architect will be responsible for developing the design and generating the construction drawings.

Click on the name of the architect in the list who should be the architect for this project.

Correct answer:

Name	Licensed in Jurisdiction of Project Locations	Years of Experience	Utilization Rate	Work Experience
Architect A	Yes	30	65	K-12 Education, Higher Education, Condominium
Architect B	Yes	18	95	Commercial, Residential, Condominium, Lighting
Architect C	No	15	45	Condominium, Historical Preservation
Architect D	Yes	12	40	Urban Design, Condominium, Residential
Architect E	No	10	75	Sports, Wellness, Condominium

CORRECT RESPONSE

Architect D

Architect D is licensed in the project's jurisdiction, has a low utilization rate, and significant experience on condominiums and residential projects, making them the most appropriate choice for architect on this project.

Section: Business Operations

Question 18

During construction, a contractor falls behind schedule and has no plan to align with the critical path. The owner asks the architect to assist in getting the schedule back on track without additional services.

Which action is within the architect's standard of care for construction contract administration?

- A. Prioritizing the review and return of sequential submittals numbered by the contractor.
- B. Performing daily site visits in order to immediately respond to contractor questions in the field.
- C. Approving partially complete work in order to allow trades to work on other parts of the building.
- D. Laying out a more efficient scaffold solution that allows more access to exterior enclosure progress.

Correct answer: A

CORRECT RESPONSE

Prioritizing the review and return of sequential submittals numbered by the contractor.

The review of submittals falls within the standard of care, and the review of priority submittals to assist with the schedule does not raise the standard of care.

Section: Business Operations

Question 19

The partners in an architectural firm are reviewing their policies and procedures in order to become a more socially responsible design practice that better supports organizational health.

Which workplace policies and procedures should the firm implement? **Check the three that apply.**

- A. Implement a fixed work schedule with structured breaks.
- B. Increase staff diversity to reflect the community served.
- C. Donate 1/5 of billable hours to volunteer work.
- D. Limit times of extended computer use.
- E. Add a workplace wellness program.
- F. Allow for unlimited overtime.

Correct answer: BDE

CORRECT RESPONSES

Increase staff diversity to reflect the community served.

Public health, safety, and welfare is ensured more effectively when architecture professionals reflect the communities they serve.

Limit times of extended computer use.

Interrupting extended computer use will decrease work-related health problems and will increase productivity.

Add a workplace wellness program.

Wellness programs have been proven to reduce sick days and increase productivity.

Section: Practice Methodologies

Question 20

The partners of a newly created architectural firm have a goal of establishing themselves as experts in the aviation and transportation sectors. They are awarded a small-scale aviation project that will require them to hire several junior CAD/BIM staff members. The firm wants to make sure that the junior staff efficiently assemble contract documentation for the project.

How can the firm partners increase the efficiency of the junior production staff?

- A. Establish master specifications of common aviation materials.
- B. Implement a standard detail library of material assemblies.
- C. Hire engineering consultants that specialize in aviation projects.

Correct answer: B

CORRECT RESPONSE

Implement a standard detail library of material assemblies.

A standard detail library will save junior staff time in drawing or recreating details for the construction documents and will also reduce opportunities for errors and/or omissions.

Section: Business Operations

Question 21

An owner asks an architect to suggest a delivery method that is suited for a time-sensitive, two-building project in which risks are decreased by validating costs per task.

Click on the row in the delivery method options schematic to indicate the most appropriate delivery method.

Correct answer:

Delivery Method Options												
PD	SD		DD		CD			BN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CA
<input type="checkbox"/>	PD	SD		DD		<input type="checkbox"/>	CD-Pkg 1	<input type="checkbox"/>	<input type="checkbox"/>	CA	CD-Pkg 2	CD-Pkg 3
PD	SD		<input type="checkbox"/>	DD		CD		BN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CA
<input type="checkbox"/>	PD	SD		DD		CD		BN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PD	SD		DD		CD				CA
PD	SD		DD		<input type="checkbox"/>	<input type="checkbox"/>	CD					CA

<p>PD Pre-design</p> <p>SD Schematic design</p> <p>DD Design development</p> <p>CD Contract documentation</p> <p>BN Bidding/negotiation</p> <p>CA Construction contract administration</p>	<p><input type="checkbox"/> Cost of construction determined</p> <p><input type="checkbox"/> Constructor contract determined</p> <p><input type="checkbox"/> Subcontractors selected</p> <p><input type="checkbox"/> CM selected</p>
--	---

CORRECT RESPONSE

Row 2 - Construction manager as constructor delivery method

This row shows the phases used in a construction manager as constructor project delivery method when time, cost, and risk are factors. Added differentiation of packages also helps to align with the owner's goals.

Section: Practice-Wide Delivery of Services

Question 22

Annual Indirect Expenses		Annual Direct Labor Expenses	
Rent	\$54,600.00	Principal	\$81,500.00
Insurance	\$60,000.00	Project Architect	\$62,500.00
Indirect Labor	\$80,000.00	Intern A	\$32,200.00
Software	\$30,000.00	Intern B	\$20,800.00
IT services	\$20,400.00		
Office Supplies	\$15,000.00		
Printing	\$12,000.00		
Utilities	\$8,000.00		

Refer to the exhibit.

What is the firm's overhead rate?

- A. 0.7
- B. 1.42
- C. 1.7
- D. 2.42

Correct answer: B

CORRECT RESPONSE

1.42

Overhead rate = total indirect expenses / total direct labor expenses

CALCULATIONS

1. Determine total indirect expenses: $\$54,600 + \$60,000 + \$80,000 + \$30,000 + \$20,400 + \$15,000 + \$12,000 + \$8,000 = \$280,000$
2. Determine total direct labor expenses: $\$81,500 + \$62,500 + \$32,200 + \$20,800 = \$197,000$
3. Calculate break even rate: $\$280,000 / \$197,000 = 1.42$

Section: Finances, Risk, & Development of Practice

Question 23

In an effort to facilitate a flexible work environment, a small architecture firm decides to make changes to their design and documentation methodology in order to allow for an off-site, work-at-home option.

Which methodology is most appropriate for enabling off-site work?

- A. Store all project files as PDF files in a password-protected website.
- B. Create an accessible, cloud-based, multi-platform virtual studio space.
- C. Publish all construction documentation in a password-protected database.

Correct answer: B

CORRECT RESPONSE

Create an accessible, cloud-based, multi-platform virtual studio space.

Creating a virtual studio with access to all firm resources, including BIM elements, product specifications, and drawing files, allows staff to work flexibly in a variety of locations and with several user interfaces (laptops, digital pads, phones, etc.) for design and documentation.

Section: Practice Methodologies

Question 24

In January of Year 1, a school asks an architecture firm to design a new gymnasium, which must be available for the start of the school year in September of Year 2. The school wants to thoroughly vet the design and desires competitive construction pricing. The firm has experience with gymnasium design and estimates the following:

- Two months to establish a design.
- Four months to complete construction documents.
- One month to obtain permits.
- Twelve months to complete construction.

Which contracting and procurement scenario should the firm recommend?

- A. A contract for the preliminary design and a competitive bid to select the general contractor.
- B. A contract for the preliminary design and a design-build contract with the selected contractor.
- C. A contract for complete construction documents and a competitive bid to select the general contractor.

D. A contract for complete construction documents and a design-build contract with the selected contractor.

Correct answer: C

CORRECT RESPONSE

A contract for complete construction documents and a competitive bid to select the general contractor.

This will provide the desired design involvement, and a competitive bid addresses the school's concern regarding cost of construction.

Section: Practice-Wide Delivery of Services

Question 25

Two architects open a firm as a partnership. The partners sign a lease for an office, hire two employees, and secure two pending government projects that will financially sustain the firm for several months. The two projects have the following requirements:

- Architect shall carry \$1,000,000 in errors and omissions insurance.
- Architect shall carry all statutory insurance coverage.

Which insurance policies do the partners need to carry? **Check the three that apply.**

- A. General business coverage
- B. Health insurance
- C. Director's insurance
- D. Professional liability
- E. Worker's compensation
- F. Umbrella insurance

Correct answer: ADE

CORRECT RESPONSES

General business coverage

Every business needs general liability insurance.

Professional liability

Professional liability insurance is required for their government work.

Worker's compensation

Every employer with employees is required to have worker's compensation insurance.

Section: Business Operations

Question 26

An architecture firm is competing against three local firms for a new 250,000-square-foot research building. This is the owner's first new construction project and they are concerned about cost and construction. The research building requires green design and must tie into two historical buildings recently renovated by the firm, as well as serve as the new icon for the company. The firm's backlog is low and this project is needed to support their staff.

What should the firm include in the RFP response?

- A. That their staff has sustainable design and historical preservation experience.
- B. That they have had success in dictating means and methods during construction.
- C. That their in-house estimator has perfectly guaranteed pricing of their last five projects.

Correct answer: A

CORRECT RESPONSE

That their staff has sustainable design and historical preservation experience.

That their staff has sustainable design and historical preservation experience is a piece of key information that addresses the project scope without promising an elevated standard of care.

Section: Business Operations

Question 27

An architecture firm successfully completes a coffee shop project in a large city. The owner is planning to construct three more locations in the city using the same design. The owner would like to continue working with the firm under the condition of transferring the ownership of the architectural drawings.

How should the architect respond?

- A. Transfer the ownership under partnership.
- B. Explain to the owner that the designs are not tangible goods for sale.
- C. Suggest using the same drawings for all the upcoming projects as they are all in the same city.
- D. Transfer the ownership since the owner has already paid for the architectural services with the initial contract.

Correct answer: B

CORRECT RESPONSE

Explain to the owner that the designs are not tangible goods for sale.

As the architects are the authors and creators of the drawings, they are the intellectual property of the architects and are protected by U.S. copyright laws.

Section: Finances, Risk, & Development of Practice

Question 28

An architecture firm is approached by a long-term client with an RFP for a hospitality project. The firm has been in practice for 10 years and has concentrated on multifamily projects that generally have a construction budget of between \$10 and \$30 million. Their staff of twenty is very busy and has commitments through the next four months. The firm is deciding whether to proceed with the project by evaluating the following project details:

- The project consists of a hotel containing a restaurant.
- The construction budget is \$20 million.
- The design is expected to start in three months.

For which of the following reasons should the firm proceed with the project? **Check the four that apply.**

- A. The project is for a long term client.
- B. The project is within their usual scale.
- C. The project is within their area of expertise.
- D. The project demands will require additional staff.
- E. The project could provide work as their staff frees up.
- F. The project represents an opportunity to expand their expertise.

Correct answer: ABEF

CORRECT RESPONSES

The project is for a long term client.

They have a relationship that they want to reinforce.

The project is within their usual scale.

The project construction budget is \$20 million, and the firm has experience with projects in the \$10 million to \$30 million range.

The project could provide work as their staff frees up.

Given the small gap between this project's start and the end of their current commitment, this is beneficial.

The project represents an opportunity to expand their expertise.

Opportunities to expand project type could lead to more work.

Section: Practice-Wide Delivery of Services

Question 29

An architecture firm is updating their rules for the proper dimensioning of their architectural drawings. They want to provide their construction personnel with clear and unambiguous aspects of general dimensioning.

Which of the following rules should the firm use? **Check the four that apply.**

- A. Avoid notes on plans when dimensional control of an element is unnecessary so that the lack of information isn't viewed as an error or omission.
- B. Provide actual dimension strings even when there is an opportunity to describe an element with a note such as "align."
- C. Provide critical dimensions for things that are important in location or that must have a controlled placement.
- D. Dimension corridor partitions from the corridor side of the partition with a clear egress width.
- E. Dimension toilet room drywall partitions from the toilet room side of the partition.
- F. Avoid the use of fractions smaller than "1/8" anywhere on floor plans.

Correct answer: CDEF

CORRECT RESPONSES

Provide critical dimensions for things that are important in location or that must have a controlled placement.

This is a general basis for all dimensioning in architectural documentation.

Dimension corridor partitions from the corridor side of the partition with a clear egress width.

The clear width of a corridor is a critical dimension. It is important to account for any finish that might affect the clear corridor width.

Dimension toilet room drywall partitions from the toilet room side of the partition.

The interior clear dimensions of toilet rooms are critical dimensions. This is particularly important in areas of accessibility.

Avoid the use of fractions smaller than "1/8" anywhere on floor plans.

The use of small fractions on plans indicates an unnecessary, overly precise approach.

Section: Practice Methodologies

Question 30

A firm completes design and permitting services for a five-story office building using an AIA B101. During the contractor bidding process, the owner's insurer requests the contract documents for review. The insurer issues the following list of requirements that the architect must provide:

- HVAC system commissioning
- Building envelope leakage testing
- Increased UV performance for roof membrane
- Additional operational insurance requirements

What action should the architect take next?

- A. Revise bid documents to include requirements.
- B. Send an additional service proposal to the owner.
- C. Hire a commissioning agent as a subconsultant.

Correct answer: B

CORRECT RESPONSE

Send an additional service proposal to the owner.

Provision of changes is considered an additional service under the B101 and should be in place prior to beginning the work to update the bid documents.

Section: Practice-Wide Delivery of Services

Question 31

XYZ APARTMENTS - FINAL FINANCIALS		
Total Fee Received		\$150,000
Fees to Consultants		\$50,000
Direct Labor	440 Hours @ \$125	\$55,000
Assigned Overhead	1.5 x Direct Labor	\$82,500
Expenses		\$5,000
Net Profit (Loss)		(\$42,500)

Refer to the exhibit.

In order to avoid problems on future fixed fee projects, an architecture firm is reviewing the financial results from their XYZ Apartments project. For XYZ, the firm originally projected 300 staff hours with an average cost of \$125 per hour. Their consultant proposals for the project included \$10,000 for structural engineering and \$15,000 for mechanical/electrical engineering.

What practices should the firm incorporate to avoid problems on future projects? **Check the four that apply.**

- A. Reduce the overhead factor for the project.
- B. Include a contingency in their estimate of hours.
- C. Monitor time spent during the project more closely.
- D. Secure consultant fee proposals before submitting a fee to the client.
- E. Ask the client for more money when the time spent runs over the estimate.
- F. Include expenses as a reimbursable item rather than including them in the fee.

Correct answer: BCDF

CORRECT RESPONSES**Include a contingency in their estimate of hours.**

A contingency will compensate for incorrect estimations of the amount of time required for the project.

Monitor time spent during the project more closely.

If the amount of time spent on the project is monitored more closely, it will allow the firm to detect and prevent time overruns.

Secure consultant fee proposals before submitting a fee to the client.

Getting consultant fees upfront will eliminate overruns in this area.

Include expenses as a reimbursable item rather than including them in the fee.

Including reimbursable expenses in the owner/architect agreement allows the firm to make up these expenses.

Section: Finances, Risk, & Development of Practice

Question 32

Two recently registered architects decide to start a new firm together. They have one contract pending execution for an office building, and multiple additional proposals are expected in the near future. The partners need to set up their new office and hire staff to help fulfill their pending contract for the office building. In order to start the firm, the following expenses are projected:

- Computers: \$6,300 initial cost
- Employee Salaries: \$4,965 per pay period
- Insurance: \$4,750 for six months
- Office Rent and Software: \$2,350 per month

Architectural design fees under contract for the office building project amount to \$85,000 and will be completed within the first six months.

Excluding the salaries and expenses of the two partners, how will the firm perform financially in the first six months, which includes 13 pay periods?

- A. The firm will generate profit.
- B. The firm will lose money.
- C. The firm will break even.

Correct answer: B

CORRECT RESPONSE**The firm will lose money.**

Based on the calculation, the firm would lose money if they only accepted the single project.

CALCULATIONS

1. Computers: $\$6,300 \times 1 = \$6,300$
2. Employee salaries: $\$4,965 \times 13 = \$64,545$
3. Insurance: $\$4,750 \times 1 = \$4,750$
4. Office rent and software: $\$2,350 \times 6 = \$14,100$
5. Total expenses: $\$89,695$
6. Profit loss: $\$85,000 - \$89,695 = -\$4,695$

Section: Finances, Risk, & Development of Practice

Question 33

A developer hires an architecture firm to design a new apartment building. The firm completes construction documents and a building permit is issued. The firm will provide CA services at a rate of \$200 per hour for the principal and \$150 per hour for the project manager. As the firm starts CA, the owner asks for a not-to-exceed fee based on the following:

- Twenty shop drawings, which the project manager will handle at an average of three hours per review.
- Three site visits, which the principal will handle at an average of four hours per site visit.

The firm includes a 10% allowance for unknowns.

What should the not-to-exceed fee be?

- A. \$11,400
- B. \$12,540
- C. \$13,800
- D. \$15,240

Correct answer: B

CORRECT RESPONSE
\$12,540

CALCULATIONS

1. Shop drawing review: \$150 per hour (project manager) x 3 hours per review x 20 shop drawings = \$9,000
2. Site visits: \$200 per hour (principal) x 4 hours per visit x 3 visits = \$2,400
3. \$9,000 (shop drawing review) + \$2,400 (site visits) = \$11,400
4. \$11,400 + 10% (allowance for unknowns) = \$12,540

Section: Finances, Risk, & Development of Practice

Question 34

	RFP A	RFP B	RFP C
Client	Repeat client with a good relationship	Worked with client previously, but a different project type	No previous experience with client
Contract	Owner generated agreement	Standard AIA agreement	Standard AIA agreement
Project Type / Experience?	Some experience in project type, but a sector the firm would like to grow in	Good amount of experience in project type	Extensive experience in project type, firm has won 5 major design awards
Project Size / Staffing	Small project, adequate staff available	Medium size project, but staff is unavailable or limited during project timeline	Very large project, would require firm to hire 5+ staff or consultants
Fee	Fixed Fee / Good, profit generating	Hourly not to exceed / Adequate	Fixed Fee / Adequate, but will need to be managed very closely
Other / Notes	Potential for several repeat projects of the same type	Requires architect to hire geotechnical consultant & surveyor	Proposal requires 3 concept design to be included in submission, and the purchase of updated BIM software

Refer to the exhibit.

An architecture firm is evaluating three RFPs based on risk to the firm and the potential benefits of expanding to new sectors and gaining new clients.

Which RFP should the firm pursue?

- A. RFP A
- B. RFP B
- C. RFP C

Correct answer: A

CORRECT RESPONSE
RFP A

RFP A allows for the potential benefits of repeat work in a new market sector. The risk of working under an owner-generated agreement is balanced by the small project size and a good fee.

Section: Practice-Wide Delivery of Services

Question 35

Firm Project Summary & Schedule												
Staff Member	January	February	March	April	May	June	July	August	September	October	November	December
Project Manager #1	Elementary School CDs		Bidding		Construction							
Avg. Utilization Rate: 115%	Senior Living DD		CDs				High School SD		DD		CDs	
	College STEM Proposal				Owner Eval		Bidding		Construction			
Project Manager #2	Fire Station Construction											
Avg. Utilization Rate: 87%	Office Building CDs				Construction							
	Rec Center Proposal		Owner Eval		SD			DD				
Architect #1	Elementary School CDs		Bidding		RFIs							
Avg. Utilization Rate: 75%					High School SD		DD		CDs			
					College STEM SD							
Architect #2	Office Building CDs				RFIs							
Avg. Utilization Rate: 98%	Rec Center Proposal		Owner Eval		SD			DD				
	Senior Living DD		CDs				Bidding		RFIs			
Intern #1	Office Building CDs											
Avg. Utilization Rate: 85%	Senior Living DD		CDs				Rec Center SD		DD			
Intern #2	Elementary School CDs		Bidding									
Avg. Utilization Rate: 60%					High School SD		DD		CDs			
					College STEM SD							

Refer to the exhibit.

The Office Building project is put on hold indefinitely after construction documents are complete. Additionally, the High School project is delayed by four months due to a funding issue.

Which one of the following adjustments should the firm make to rebalance the workloads?

- Architect #1 should take on construction phase responsibilities for the Elementary School project.
- Architect #2 should write the College STEM project proposal.
- Architect #1 and Architect #2 should be assigned to the Recreation Center project until the High School project begins.

Correct answer: A

CORRECT RESPONSE

Architect #1 should take on construction phase responsibilities for the Elementary School project.

Since Architect #1 will have a gap in their schedule due to the delay of the High School project, they can take on construction phase responsibilities for the Elementary School project and relieve the overallocated Project Manager #1, whose utilization rate is over 100%.

Section: Business Operations

Question 36

A school board issues an RFP for a new elementary school. CBA Architects has significant experience in designing elementary schools and is eager to respond to the RFP. They contact Building General Contractors (BGC), who has built several schools for CBA's clients. CBA is organized as a professional corporation and BGC is organized as an S corporation. The RFP contains the following information:

- The proposal should be design-build.
- The construction budget will be \$20 million.
- The responding entity should include a complete bond and compliance with prevailing wage regulations.
- The response is due in three weeks along with a complete fee.

Which of the following arrangements should CBA and BGC consider for their response to the RFP? **Check the three that apply.**

- CBA submits an RFP response and fee and lists BGC as the consulting contractor.
- CBA and BGC form a new LLC and then submit an RFP response and fee.
- CBA and BGC form a new C corporation and then submit an RFP response and fee.
- CBA and BGC form a joint-venture partnership and then submit an RFP response and fee.
- BGC submits an RFP response and fee and includes CBA as the consulting architect.
- BGC submits an RFP response and fee and CBA submits a separate response and fee for architectural services.

Correct answer: BDE

CORRECT RESPONSES

CBA and BGC form a new LLC and then submit an RFP response and fee.

An LLC can be used to provide design-build services and can be easily formed.

CBA and BGC form a joint-venture partnership and then submit an RFP response and fee.

The partnership form can be used to provide design-build services and can be easily formed.

This arrangement represents a standard contractor-led design-build.

Section: Practice Methodologies

Question 37

The roof of an architecture firm's office fails in a storm and the server room floods. The firm must close for a week to repair the damage.

Which insurance policies will cover the firm's losses, including revenue and production time? **Check the two that apply.**

- A. Workers' compensation insurance
- B. Commercial property insurance
- C. Business income insurance
- D. Professional liability insurance
- E. General liability insurance
- F. Employee health insurance

Correct answer: BC

CORRECT RESPONSES

Commercial property insurance

Commercial property insurance would help defray the cost of damage to the office and other physical business assets affected by the flood.

Business income insurance

Business income insurance would help cover lost billable income during the closed week and the ensuing recovery process.

Section: Business Operations

Question 38

An architect who is a sole proprietor carries \$1,000,000 in professional liability insurance. The architect wins a new building project that requires \$3,000,000 in professional liability insurance.

For how long must the architect carry the additional professional liability insurance for this project?

- A. For the life of the building.
- B. For years after the project is completed.
- C. Until the completion of all design phases.
- D. Until the certificate of occupancy is issued.

Correct answer: B

CORRECT RESPONSE

For years after the project is completed.

Jurisdictional requirements vary, but the architect will be required to carry additional liability insurance for many years after the completion of construction.

Section: Business Operations

Question 39

An architecture firm receives an RFQ that outlines full design, construction, and commissioning services for a new urban arts center with the following details:

- A 150,000 sf building with teaching spaces, museum, and cafe.
- Adequate parking facilities.
- A three-acre waterfront park connected to the new arts center.
- Requires permitting, design reviews, and city council presentations.
- Pricing sets that must be established early and remain stable throughout design.

The firm specializes in conceptual and specialty design of education and large assembly spaces, but the firm has limited experience in landscape design. Additionally, the firm does not currently have the staffing to fully support construction document production for a project of this scale.

Which project delivery method should the firm submit in their qualifications package?

- A. Bridged design-build with the firm serving as design architect.

- B. Architect-led design-build with the firm serving as full-service lead.
- C. Joint venture design team with a landscape architecture firm.

Correct answer: A

CORRECT RESPONSE

Bridged design-build with the firm serving as design architect.

The project is a high-profile design that requires a specialty architect. A design-build contract will ensure that the project is delivered efficiently in terms of cost while bridging allows the project to have multiple architects/landscape architects taking on separate portions of the design, document preparation, and construction. Design-build allows for the price to be established before design is complete.

Section: Practice-Wide Delivery of Services

Question 40

During the course of work on a project, an architecture firm and its client make a decision that the project architect believes will adversely affect public safety. The project architect expresses concern to their employer and the client about the decision they made and says they cannot consent to following it. The employer tells the project architect that they must follow their decision and prepare the construction documents accordingly or seek employment elsewhere.

According to AIA Code of Ethics and Professional Conduct, what should the project architect do?

- A. Ignore the decision and prepare the documents as they see appropriate.
- B. Inform the building inspector of their concerns with the decision made.
- C. Prepare the construction documents as directed by the employer.

Correct answer: B

CORRECT RESPONSE

Inform the building inspector of their concerns with the decision made.

AIA Code of Ethics and Professional Conduct, Rule 2.105:

"If, in the course of their work on a project, the Members become aware of a decision taken by their employer or client which violates any law or regulation and which will, in the Members' judgment, materially affect adversely the safety to the public of the finished project, the Members shall:

- "(a) advise their employer or client against the decision,
- "(b) refuse to consent to the decision, and
- "(c) report the decision to the local building inspector or other public official charged with the enforcement of the applicable laws and regulations, unless the Members are able to cause the matter to be satisfactorily resolved by other means."

Section: Business Operations

Question 41

An architecture firm is assembling an evidence-based design team for an upcoming microbiology research lab addition at the state medical university.

Click on the name of the staff member in the staffing roster who is most appropriate for this project.

Correct answer:

Staff Name	Qualifications
Furniture Designer A	Workplace research experience
Researcher V	Background in learning environment research projects
Consultant Z	Background in justice programming
Former Nurse D	Health-care focused research experience

CORRECT RESPONSE

Researcher V

Researcher V is the only staff member on the list who has education-related experience. As the upcoming project is a school project, Researcher V is the most appropriate staff member for this project.

Section: Practice Methodologies

Question 42

The principal of an architecture firm realizes there is a significant gap between current profitability and annual goals. The principal decides to implement a sustainable strategy to increase annual profitability.

What strategy should the principal implement?

- A. Add two new interns to the team.
- B. Increase billing rates by \$6 per hour.
- C. Accept various projects in new typologies.
- D. Extend the design team's work to 50 hours per week.

Correct answer: B

CORRECT RESPONSE

Increase billing rates by \$6 per hour.

Increasing billing rates will help meet the annual goal without significantly increasing operational expenses.

Section: Finances, Risk, & Development of Practice

Question 43

A new client asks an architecture firm, who has extensive experience with multifamily housing projects, to design a 500-unit, mixed-use project.

How should the firm verify that they will most likely receive payment for the project? **Check the three that apply.**

- A. Require the client to pay all invoices in full within 30 days or include an additional 1% penalty for late payment.
- B. Evaluate the client's brand to determine if the client's values are in alignment with the firm's values.
- C. Determine if the client's budget can cover both construction costs and design fees.
- D. Require a deposit of 10% of the design fee upfront before beginning services.
- E. Ask other architects about their experience of working with this client.
- F. Ask contractors about their experience of working with this client.

Correct answer: CEF

CORRECT RESPONSES

Determine if the client's budget can cover both construction costs and design fees.

It is appropriate for the architect to determine if the client has a realistic understanding of the costs of the project and has a budget that will cover those costs.

Ask other architects about their experience of working with this client.

It is appropriate for the architect to verify the reputation of a new client with architects who have previously worked with them in order to verify that the client has a history of timely payment.

Ask contractors about their experience of working with this client.

It is appropriate for the architect to verify the reputation of a new client with contractors who have previously worked with them in order to verify that the client has a history of timely payment.

Section: Practice-Wide Delivery of Services

Question 44

An architect is in an initial program meeting with a trusted client. The client says they have acquired drawings of a hotel prototype that has been successfully built in five other locations. The client asks the architect to use the hotel drawings to prepare a permit set for a site that the client owns.

What action should the architect take to comply with ethical standards?

- A. Stamp the drawings, including consultant drawings, based on the historical success of the hotel plan set.
- B. Verify with the client they have satisfied all copyright requirements for use of the design before taking on the project.
- C. Redraft the drawings after all local code analyses are complete.
- D. Assume the drawings have been acquired legally and site adapt the prototype.

Correct answer: B

CORRECT RESPONSE

Verify with the client they have satisfied all copyright requirements for use of the design before taking on the project.

Ethical standards require that all copyright requirements are met when an architect is using drawings that they did not create themselves.

Section: Business Operations

Question 45

PROJECT DESIGN COORDINATION CHECKLIST

Project Title: Niceview Apartments

Phase: 95% CDs / Permit Set

Item	Architect	Mechanical	Plumbing	Structural	Electrical	Civil	Notes
Mechanical room plans match architectural plans	✓						
Rooftop mechanical equipment locations match structural	✓			✓			
Rooftop mechanical equipment clearances	✓						
Mechanical roof penetrations match structural roof penetrations	✓	✓		✓			
Location of exterior AHU matches location of concrete pad	✓				✓		
Concrete pad sized for clearances around exterior AHU	✓						
Ceiling diffusers and grilles match architectural reflected ceiling plan	✓						
Beam/duct clearances	✓						
Duct interferences with plumbing	✓	✓	✓				
All equipment is shown on schedules	✓						
Wiring and control diagrams for AHUs	✓						
Dampers located in all fire walls and rated ceilings	✓						
Fire control system tied to mechanical emergency shut off	✓						
Each room has supply and return	✓						
Thermostat locations	✓						check windows / glazing

Coordination Key

✓ = responsible to review and coordinate across disciplines

Refer to the exhibit.

An architecture firm contracts with a MEP firm for the design of an apartment building. The architecture firm agrees to use the project design coordination checklist recommended by the MEP firm. The checklist is attached to the consultant agreement and signed by both firms.

How does the use of the checklist impact the architecture firm's potential for risk?

- A. It elevates the architect's risk.
- B. It maintains the architect's risk.
- C. It reduces the architect's risk.

Correct answer: A

CORRECT RESPONSE

It elevates the architect's risk.

The checklist requires the architect to be responsible for reviewing and coordinating several items that are more appropriate for the MEP firm to coordinate (e.g. wiring and control diagrams for AHUs, all equipment is shown on schedules, etc.), not an architect. By agreeing to do this work, it elevates the architect's standard of care.

Section: Finances, Risk, & Development of Practice

Question 46

A large sports-focused architecture firm is working on a sports arena delivered through the Construction Manager at Risk (CMaR) method. Though the project has a guaranteed maximum price (GMP), the CMaR is unable to bring the project in budget or give the owner a GMP as the end of the design phase nears. The owner decides to release the CMaR from their contract and publicly bid the project. The delivery method changes to design-bid-build.

What additional responsibility will the architect take on as a result of the changes?

- A. Manage subcontractors.
- B. Sign applications for payments.
- C. Provide detailed estimate of construction cost.
- D. Assist owner in determining the lowest and best bid.

Correct answer: D

CORRECT RESPONSE

Assist owner in determining the lowest and best bid.

In a CMaR-delivered project, the architect is not responsible for assisting the owner in determining the lowest or best bid. For a design-bid-build project, though, the architect is responsible for providing assistance during bidding.

Section: Practice-Wide Delivery of Services

Question 47

An architecture firm is awarded the design of a technologically advanced 100,000-seat stadium with a five-year design and construction schedule. The owner wants to keep overall costs on budget, minimize risk, and open the stadium in time to host several major events.

Which delivery method should the firm recommend?

- A. Design-build
- B. Cost-plus fixed fee
- C. Negotiated select team
- D. Construction manager as constructor

Correct answer: D

CORRECT RESPONSE

Construction manager as constructor

A construction manager as constructor delivery method ensures the schedule of the owner will be met and places the management and risk associated with constructability and cost on the contractor.

Section: Practice-Wide Delivery of Services

Question 48

The principals of an architecture firm have recently noticed large differences in the sizes of construction drawing sets, by up to 40 sheets, for several projects of similar scope and size. They have asked the project manager to recommend construction drawing methodologies in order to properly size a typical set.

What methodologies should the project manager recommend? **Check the three that apply.**

- A. Working in context
- B. Reduction of redundancy
- C. Default scheduling
- D. Referencing systems
- E. Instructional systems
- F. Terms and abbreviations

Correct answer: BCE

CORRECT RESPONSES

Reduction of redundancy

Reduction of redundancy is an effort to manage the duplication of construction drawing elements. This will help in the efficiency of the drawings.

Default scheduling

Default scheduling is used to schedule building components that cover a majority of project conditions. This will reduce construction document sizes by allowing typical and repetitive items to be efficiently documented.

Instructional systems

Instructional systems are drawings and notes that graphically coach the contractor to an understanding of the documentation. These systems define defaults while identifying and documenting the exceptions. This reduces extra sheets in a set of documents.

Section: Practice Methodologies

Question 49

A recently registered architect has one upcoming conceptual kitchen design project that the client wants to start as soon as possible. Before starting the project, though, the architect wants to set up an architectural firm, which will be limited to small-scale conceptual works.

Which type of business entity should the architect adopt?

- A. General corporation
- B. Limited liability partnership
- C. Limited liability company

Correct answer: C

CORRECT RESPONSE

Limited liability company

A limited liability company is an easy business entity to form. As the architect would like to continue with low-risk, small-scale projects alone, they do not need to form a complex legal entity.

Section: Practice Methodologies

Question 50

An architectural firm is awarded an RFP for a \$30 million hospital expansion. The expansion is to be built on an existing parking lot and requires the architect to provide geotechnical services. The firm will need to contract with a geotechnical engineer in order to provide those services.

Which of the following provisions should the firm include in their contract with the geotechnical engineer? **Check the four that apply.**

- A. The architect shall provide the geotechnical engineer with relevant existing condition reports, surveys, and documentation of ownership as provided by the owner.
- B. The geotechnical engineer shall assume the defense of any claims arising from their services directly and will not seek contribution from the architect.
- C. The owner will release the architect of all liability and responsibility for the geotechnical engineer's services.
- D. The geotechnical engineer will provide certificates of insurance that align with the types and limits of coverage required by the architect's contract with the owner.
- E. The architect and geotechnical engineer shall jointly assume costs associated with additional explorations not included in the original scope of the design contract.
- F. The geotechnical engineer shall immediately notify the owner and architect of hazardous materials detected during field explorations.

Correct answer: ABDF

CORRECT RESPONSES

The architect shall provide the geotechnical engineer with relevant existing condition reports, surveys, and documentation of ownership as provided by the owner.

The architect should provide all owner-provided information to the geotechnical engineer.

The geotechnical engineer shall assume the defense of any claims arising from their services directly and will not seek contribution from the architect.

The architect should protect themselves from being responsible for claims levied at their consultant.

The geotechnical engineer will provide certificates of insurance that align with the types and limits of coverage required by the architect's contract with the owner.

Requiring the geotechnical engineer to have the same levels of coverage as the architect provides greater protection to the architect.

The geotechnical engineer shall immediately notify the owner and architect of hazardous materials detected during field explorations.

This information should not be withheld, but should be presented to both the architect (as the engineer's client) and owner simultaneously.

Section: Practice-Wide Delivery of Services

Question 51

An architecture firm is developing a systematic way of eliminating paper copies of files for projects that have been completed. They decide that the files to be eliminated first are those for projects for which no claims can arise.

Which project files should the firm eliminate first?

- A. Files for projects that have the fewest change orders.
- B. Files for projects that are beyond the statute of limitations.
- C. Files for projects that have a letter of recommendation from the owner

Correct answer: B

CORRECT RESPONSE

Files for projects that are beyond the statute of limitations.

Projects that are beyond the statute of limitations are legally protected from claims.

Section: Finances, Risk, & Development of Practice

Question 52

A potential client has requested a proposal from an architect to design the first of several hotels to be located in a major city. The architect has a short but successful history in hospitality design and is licensed to practice in the jurisdiction. As part of the initial discussion with the firm, the client indicates that their goal is to build up to three more hotels in other major cities of the state.

Which factors should the architect consider when deciding on the architectural fee? **Check the three that apply.**

- A. Client type
- B. Contractor's GMP
- C. Project delivery method
- D. Jurisdiction of construction
- E. Standard of care expectations
- F. Owner-consultant coordination

Correct answer: ACE

CORRECT RESPONSES

Client type

The characteristics of clients can have an effect on the amount of person-hours spent on the project and is a consideration in determining the fee.

Project delivery method

Project delivery method should be considered when establishing a fee because the same project can have different levels of risk depending on how the construction is procured.

Standard of care expectations

Risk increases significantly when a client suggests contract language that alters or increases the standard of care, and the architectural fee should reflect this additional risk.

Section: Practice-Wide Delivery of Services

Question 53

An architecture firm must increase profits for the upcoming year and has a current backlog of projects for the year. The firm is comprised of three partners, eight architectural production and management staff members, and three administrative assistants.

Which of the following strategies will most likely increase profits?

- A. Invest in more marketing and advertising.
- B. Reduce the administrative staff to two assistants.
- C. Pursue work in markets where the firm has not worked before.

Correct answer: B

CORRECT RESPONSE

Reduce the administrative staff to two assistants.

Reducing the number of administrative assistants will reduce direct expenses, and if fee income stays the same, profits will increase.

Section: Finances, Risk, & Development of Practice

Question 54

ABC Architects receives the RFP from the Community Development Corporation on March 16 of Year 1. ABC is submitting a proposal as the lead architect for the affordable housing project.

Which one of the following will be an obstacle to the selection of ABC's proposal?

- A. Lack of a license in State B.
- B. Lack of staff expertise in sustainable design.
- C. Lack of experience with housing projects.

Correct answer: A

CORRECT RESPONSE

Lack of a license in State B

No one in ABC Architects is licensed in State B.

CASE STUDY RESOURCES USED

Scenario
RFP
Firm Profile

Section: Finances, Risk, & Development of Practice

Question 55

XYZ Partners is drafting an RFP response for the mixed-use affordable housing project. In their response, XYZ identifies ABC Architects as a consultant, but XYZ still needs to list the consultant services that they want ABC to perform.

For which one of the following combinations of consultant services should ABC Architects be made responsible?

- A. Programming, sustainability consulting, cost estimating
- B. Programming, sustainability consulting, housing unit design
- C. Sustainability consulting, housing unit design, cost estimating
- D. Sustainability consulting, housing unit design, construction administration

Correct answer: B

CORRECT RESPONSE

Programming, sustainability consulting, housing unit design

ABC's firm profile and the scenario establish ABC as the housing design expert and their resume indicates LEED AP credentials.

CASE STUDY RESOURCES USED

Scenario

Firm Profile

RFP

Section: Practice-Wide Delivery of Services

Question 56

ABC Architects and XYZ Partners decide to collaborate on the mixed-use affordable housing project. Their response to the RFP identifies the following project team:

- XYZ Partners: Architect of record
- ABC Architects: Design consultant
- CSME Engineers: Civil, structural, mechanical, electrical, plumbing, and fire protection engineers

The architects propose a total lump sum fee equal to 6% of the maximum construction cost. CSME Engineers' fee is 35% of the total fee. All other required design services will be provided by one of the architecture firms. ABC Architects' lump sum fee meets the RFP's minimum fee requirement for minority-owned businesses.

What is XYZ Partners' fee for the project?

- A. \$140,400
- B. \$216,000
- C. \$378,000
- D. \$486,000

Correct answer: D

CORRECT RESPONSE

\$486,000

CALCULATIONS

1. Determine total fee: $\$18,000,000 \times 6\%$ (architect lump sum fee) = $\$1,080,000$
2. Determine engineering consultant fees: $\$1,080,000 \times 35\%$ (engineer fee) = $\$378,000$
3. Determine total architecture/design fee: $\$1,080,000 - \$378,000 = \$702,000$
4. Determine minimum minority consultant fee: 20% (minority consultant fee) $\times \$1,080,000 = \$216,000$
5. Determine XYZ Partners' fee: $\$702,000 - \$216,000 = \$486,000$

CASE STUDY RESOURCES USED

Scenario

RFP

Firm Profiles

Section: Practice-Wide Delivery of Services

Question 57

Proposed Project Team Arrangements			
A	B	C	D
XYZ will hold the contract and be the architect of record.	ABC will hold the contract and be the architect of record.	ABC will hold the contract; XYZ will be the architect of record.	XYZ will hold the contract and be the architect of record.
ABC will provide the programming and schematic design phases of services and receive 30% of the architectural fee.	ABC will provide the programming and conceptual design phases of services and receive 30% of the architectural fee.	ABC will provide the programming and schematic design phases of services and receive 20% of the architectural fee.	ABC will provide the programming and schematic design phases of services and receive 20% of the architectural fee.
XYZ will provide all remaining architectural services and receive 70% of the architectural fee.	XYZ will provide all remaining architectural services and receive 70% of the architectural fee.	XYZ will provide all remaining architectural services and receive 80% of the architectural fee.	XYZ will provide all remaining architectural services and receive 80% of the architectural fee.

Refer to the exhibit.

ABC Architects wants to respond to the RFP as a way to expand their experience. They expect the engineering fees to represent 30% of the fee and the architectural fees to represent 70%. CSME will provide engineering services.

Which one of the following arrangements should ABC propose?

- A. A
- B. B
- C. C
- D. D

Correct answer: A

CORRECT RESPONSE

A

XYZ has the appropriate insurance and license, and so they must be the architect of record. With 30% of the architectural design fee, ABC will provide the required minority-owned business participation.

CALCULATIONS

1. 70% of the total design fee will be split between ABC and XYZ.
2. 30% of the 70% is allocated for ABC: $30\% \times 70\% = 21\%$
3. 21% meets the RFP's minimum allocation for minority and women owned businesses.

CASE STUDY RESOURCES USED

Scenario
Firm Profiles
RFP

Section: Finances, Risk, & Development of Practice

Question 58

ABC Architects and XYZ Partners have decided to collaborate and have been awarded the affordable housing project. ABC and XYZ are now staffing the project team.

Drag the design service label onto the staffing array to indicate the staff member most appropriate to perform each service. Not all service labels will be used.

Correct answer:

	G.H. Jones	P.Q. Bickford
	Sustainable Design	Landscape Design
	CSME Engineering	L.M. Bowman
	Interior Design	Structural Design
	Structural Design	Cost Estimating

CORRECT RESPONSES

Sustainable Design - G.H. Jones

As the only LEED-certified individual among the staffing options given, G.H. Jones is the most appropriate staff member for providing sustainable design services.

Landscape Design - P.Q. Bickford

As the only landscape architect on the staff, P.Q. Bickford is the most appropriate staff member for providing landscape design services.

Structural Design - CSME Engineering

As a provider of structural engineering services, CSME Engineering is most appropriate for handling structural design.

Cost Estimating - L.M. Bowman

As the only cost estimator on staff, L.M. Bowman is the most appropriate staff member for providing cost estimating services.

CASE STUDY RESOURCES USED**Scenario****Firm Profiles**

Section: Practice-Wide Delivery of Services

Question 59

ABC Architects and XYZ Partners Architecture are awarded the mixed-use affordable housing project. The team has been given a 10% total design fee with the architectural portion of the fees equaling 35% of the total design fee.

Assuming ABC Architects is allocated the percentage of the design fee stipulated for minority-owned businesses in the RFP, what is the maximum fee XYZ Partners can earn?

- A. \$126,000
- B. \$225,000
- C. \$270,000
- D. \$360,000

Correct answer: C

CORRECT RESPONSE

\$270,000

CALCULATIONS

1. For the total design fee: \$18,000,000 (maximum construction budget) x 0.1 (design fee percentage) = \$1,800,000
2. For the maximum fee percentage for XYZ Partners: 35% (architectural portion of design fee) - 20% (percentage of fee needed to allocate to a minority-owned business, ABC Architects) = 15%
3. For the maximum design fee for XYZ Partners: \$1,800,000 (total design fee) x 0.15 = \$270,000

CASE STUDY RESOURCES USED**Scenario****RFP**

Section: Finances, Risk, & Development of Practice

Question 60

ABC Architects and XYZ Partners hire an interior design firm to design the Community Space interiors and one model apartment of each of the following unit types: Studio, One Bedroom, and Two Bedroom. The model apartment units are to have the maximum square footage stipulated in the program.

The cost of the interior design services will be itemized as part of the stipulated sum in the fee proposal. The interior design service fees are based on \$30 per square foot and 10% for coordination.

What is the itemized fee for interior design services?

- A. \$82,500
- B. \$90,750
- C. \$172,500
- D. \$189,750

Correct answer: D

CORRECT RESPONSE

\$189,750

CALCULATIONS

1. Community Space: 3,000 square feet x \$30 (price per square foot for interior design services) = \$90,000
2. Studio Unit: 650 square feet x \$30 = \$19,500
3. One Bedroom Unit: 900 square feet x \$30 = \$27,000

4. Two Bedroom Unit: 1,200 square feet x \$30 = \$36,000
5. Total Interior Fee: \$90,000 + \$19,500 + \$27,000 + \$36,000 = \$172,500 + 10% (coordination fee) = \$189,750

CASE STUDY RESOURCES USED

**Scenario
RFP**

Section: Practice-Wide Delivery of Services

Question 61

Architecture by Design, LLP is acquiring Beta Architects, LLC, a small, two-person firm that specializes in senior housing facilities. Beta is located in an adjacent state, approximately 150 miles from Architecture by Design's current office. Architecture by Design will take on Beta's current projects, clients, office lease, and remaining staff.

The owner of Beta will retire upon selling and the other employee, a registered architect in the adjacent state, will become an Architecture by Design employee.

Which of the following should Architecture by Design include in their transition plan? **Check the four that apply.**

- A. Owner of Beta Architects will receive a one-time full buyout payment.
- B. Owner of Beta Architects will receive a staged buyout over three years.
- C. Owner of Beta Architects will be retained as a part-time consultant for no longer than 12 months to transition clients and contracts.
- D. Architecture by Design should relocate the Beta architect to the Architecture by Design office so that they can work with the rest of the team.
- E. Architecture by Design should increase their marketing budget to advertise the acquisition and update the business development plan to include marketing in the adjacent state.
- F. Architecture by Design should offer the Beta architect the option to work from home and receive a work-from-home stipend if the architect does not want to immediately relocate.

Correct answer: BCEF

CORRECT RESPONSES

Owner of Beta Architects will receive a staged buyout over three years.

This does not blur the lines between retirement and transition and staggers payout over multiple years.

Owner of Beta Architects will be retained as a part-time consultant for no longer than 12 months to transition clients and contracts.

While this will increase consultant costs, it will ensure relationships are maintained and properly transitioned during the merger while reducing overhead costs.

Architecture by Design should increase their marketing budget to advertise the acquisition and update the business development plan to include marketing in the adjacent state.

While marketing expenses already exceed Architecture by Design's budget, this is a significant transition that requires proper coordination and advertisement, especially since it is a new market and state. Additionally, this does not place the burden on the Beta architect to take on the marketing workload.

Architecture by Design should offer the Beta architect the option to work from home and receive a work-from-home stipend if the architect does not want to immediately relocate.

Keeping the Beta architect in their current location is appropriate from a work management perspective and incentivizes the architect to stay with the new firm.

CASE STUDY RESOURCES USED

**Scenario
Profit and Loss Statement**

Section: Practice Methodologies

Question 62

The architecture firm wants to avoid continuing losses in the coming year.

Which one of the following will most improve their financial performance?

- A. Reducing outside professional services
- B. Reducing administrative labor
- C. Reducing pro bono work
- D. Reducing staff

Correct answer: C

CORRECT RESPONSE

Reducing pro bono work

The level of pro bono work greatly exceeds their budget and cannot be supported by their revenue. Reducing pro bono work will have the most impact on improving the firm's financial performance.

CASE STUDY RESOURCES USED**Scenario****Profit and Loss Statement**

Section: Finances, Risk, & Development of Practice

Question 63

The architecture firm decides to get into the senior housing market for their next project.

Which indirect expense change will have the largest effect on the firm's total expenses?

- A. Professional and technology licenses
- B. Professional liability coverage
- C. Reduced pro-bono hours
- D. New marketing material

Correct answer: B

CORRECT RESPONSE**Professional liability coverage**

Moving into senior living project types will increase their existing liability exposure for which they are not insured.

CASE STUDY RESOURCES USED**Scenario****Profit and Loss Statement**

Section: Finances, Risk, & Development of Practice

Question 64

What is the difference between the firm's budgeted net multiplier and the actual net multiplier for the current year? Round to the nearest hundredth.

- A. 0.07
- B. 0.63
- C. 0.92
- D. 1.52

Correct answer: C

CORRECT RESPONSE

0.92

Net multiplier = net operating revenue / total direct labor (salary) expense

CALCULATIONS

1. Current year budgeted net multiplier: $768,500 / 287,040 = 2.68$
2. Current year net multiplier: $505,500 / 287,040 = 1.76$
3. Difference: $2.68 - 1.76 = 0.92$

CASE STUDY RESOURCES USED**Scenario****Profit and Loss Statement**

Section: Finances, Risk, & Development of Practice

Question 65

Architecture by Design, LLP decides to add new staff in the current year. However, the firm does not want to reduce net revenue per employee based on their projected budget.

How many staff members can the firm add?

- A. 1 staff member
- B. 2 staff members
- C. 5 staff members
- D. 6 staff members

Correct answer: A

CORRECT RESPONSE

1 staff member

CALCULATIONS

1. Prior year: \$527,000 (net operating revenue) / 4 (number of existing employees) = \$131,750 (net revenue per employee)
2. Current year budget: \$768,500 (net operating revenue) / \$131,750 (net revenue per employee) = 5.83, rounded down to 5 total employees
3. For the number of staff members that can be added: 5 total employees - 4 existing employees = 1 new staff member

CASE STUDY RESOURCES USED

Scenario

Profit & Loss Statement

Section: Finances, Risk, & Development of Practice

Testing Resources

For more information on test preparation references and resources, as well as testing policies and procedures, please refer to the ARE 5.0 Guidelines, available on ncarb.org.

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