



Candidate Information

EXAMINATION CONTENT OUTLINE - THEATRE RIGGING

Examination Topic	Number of Questions
1. PLANNING AND LAYOUT	50
A. FORMULAS	6
1. Calculate conversions: SI Imperial (e.g. length, weight)	
2. Apply mathematical formulas, including:	
a. Algebra	
b. Geometry	
3. Apply general principles of forces, including:	
a. Force/weight	
b. Vectors	
c. Two components of force	
B. PRINCIPLES	44
1. Apply general principles of forces, including:	
a. Point load	
b. Uniformly distributed load	
c. Static load	
d. Dynamic load	
e. Shock load	
2. Apply general principles of rigging, including:	
a. Breaking strength	
b. Design factors	
c. Working load limit	
d. Efficiency (e.g. terminations, materials)	
e. Service factor	
f. D/d ratio	
g. Fleet angle	
h. Center of gravity	
i. Load distribution (e.g. beam formulas, simple span)	
j. Fall protection and rescue design procedures	
k. Risk management	
l. Regulations (e.g. OSHA)	
3. Identify and resolve hazardous situations	
4. Determine object weight	
5. Drawings and schedules, including:	
a. Conform rigging plot to building load limitations or obstructions	
b. Interpret facility plans (e.g. electrical, HVAC, structural steel)	
c. Interpret show plans	
d. Interpret line set schedule (e.g. hanging plot)	
e. Generate line set schedule	
6. Calculate sling length and forces, including:	
a. Single point connection	

- b. 2-way bridle
 - c. Breast-lines
7. Select what is needed for safe access, including:
- a. Personnel lifts
 - b. Ladders
 - c. Fall protection
 - d. Personal protective gear
8. Select rigging materials, including:
- a. Support structures (e.g. truss, beams, pipe platform)
 - b. Lifting devices (e.g. hoists, block and fall, lever hoist)
 - c. Hardware (e.g. shackles, slings, wire rope)
 - d. Manufacturers recommendations

2. IMPLEMENTATION AND MANAGEMENT

50

A. MANAGEMENT

25

1. Perform layout, including:
- a. Assign tasks to riggers
 - b. Mark floor/grid
 - c. Determine safety guidelines (e.g. fall protection, rescue)
 - d. Establish communication procedures
 - e. Determine if adequate electrical powewr is available
2. Install rigging attachments (e.g. blocks, sheaves, anchors, points), including:
- a. Inspect assembled hardware (e.g. wire rope, slings, terminations)
 - b. Verify assembly/integrity of objects to be lifted using allowable load charts
3. Inspect entire system after lifting device is attached to objects to be lifted
4. Perform lifting/lowering operations, including:
- a. Perform pre-movement inspection of entire assembly
 - b. Assign movement tasks (e.g. spotters, operators, communications)
 - c. Establish lifting/lowering zone
 - d. Verify trim and load sharing

B. IMPLEMENTATION

25

1. Install rigging attachments (e.g. blocks, sheaves, anchors, points), including:
- a. Assemble rigging attachment hardware (e.g. hitches, pipes, clamps, anchors)
 - b. Attach hardware to overhead structure (e.g. clamps, hitches, eyebolts, blocks)
 - c. Attach objects (e.g. lights, sound, scenery)
 - d. Attach lifting device to objects to be lifted, including:
 - 1. Fabricate taidowns
 - 2. Install attachment hardware
 - 3. Float objects
 - e. Attach assembled hardware to drop/hand line with:
 - 1. Knots
 - 2. Industrial carabiners
 - f. Install fall protection
2. Perform lifting and lowering operations, including:

- a. Perform bump check
- b. Level objects
- c. Raise/lower objects, periodically rechecking level

3. STANDARD SYSTEMS

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A. STANDARD SYSTEMS

1. Standard rigging systems (including counterweight, hemp, powered and powered-assist, curtain and track, fire curtain and smoke vents):

- a. Identify components of specific systems
- b. Understand design properties of systems
- c. Install and operate spotline set(s)
- d. Determine appropriate anchoring locations
- e. Bring load to controlled stop

2. Counterweight system, including:

- a. Attach, operate, remove balanced loads
- b. Attach, operate, remove unbalanced loads
- c. Secure loads
- d. Mark trim heights
- e. Alter system configurations, including:
 - 1. Lengthen and shorten battens
 - 2. Marry arbors and battens
 - 3. Re-position line sets
 - 4. Breasting line sets
 - 5. Remove system components

3. Operate hemp system, including:

- a. Raise and lower loads
- b. Attach, operate, remove balanced loads
- c. Attach, operate, remove unbalanced loads
- d. Secure loads
- e. Mark trim heights

4. General powered system (e.g. dead haul, power assisted), including:

- a. Determine system capacity
- b. Confirm operation of emergency stop mode

5. Operate dead haul powered system (e.g. chain hoist, drum winch, line shaft), including:

- a. Raise and lower loads
- b. Mark trim heights
- c. Set limits

6. Curtain/Track, including:

- a. Determine track configuration
- b. Determine how to hang track configuration (e.g. straight, curved)
- c. Rig the curtain for operation (e.g. Austrian, Venetian)
- d. Recognize dynamic load situations
- e. Operate system
- f. Inspect system
- g. Identify components of curtain/track system

7. Fire curtain/Smoke vents, including:
 - a. Inspect system
 - b. Maintain system
 - c. Adhere to properties of the design
 - d. Recognize hazardous situations
8. Fire curtain, including:
 - a. Identify triggers (e.g. fusible links, cut the rope)
 - b. Identify clutch
 - c. Raise loads
 - d. Lower loads

TOTAL QUESTIONS 150

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