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Execution and Control of Operations

APICS CPIM-ECO

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Topic Break Down

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QUESTION NO: 1

A production manager uses a hoshin plan to communicate:

A. financial status.

B. operational issues.

C. new ideas.

D. strategy.

ANSWER: D

Explanation:

strategy. is correct because hoshin planning (also called hoshin kanri or policy deployment) is a structured management process for translating an organization's strategic direction into aligned objectives, measures, initiatives, and actions throughout the business. A production manager uses the hoshin plan to show how operational priorities support breakthrough objectives and longer-term business goals. The process creates vertical alignment—from senior leadership's strategic intent to departmental and individual responsibilities—and promotes cross-functional coordination through ongoing review and feedback. In a production environment, this means teams can connect improvement work, resource decisions, performance targets, and daily management activities to the organization's chosen strategic priorities rather than treating them as isolated local efforts. Hoshin plans commonly use tools such as an X-matrix to make the relationships among objectives, tactics, owners, and metrics visible and communicable. APICS-aligned operations management emphasizes this type of alignment so that execution and control activities directly advance the enterprise strategy. See ASQ's overview of hoshin kanri and Lean Enterprise Institute's description of strategy deployment.

QUESTION NO: 2

Which of the following measures best indicates the effectiveness of a preventive maintenance program?

A. Reduction in unplanned equipment downtime

B. Increase in maintenance work orders issued

C. Increase in spare-parts inventory

D. Reduction in planned maintenance time

ANSWER: A

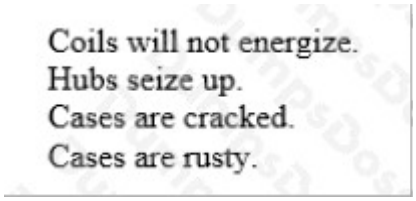
Explanation:

Reduction in unplanned equipment downtime is correct because preventive maintenance is intended to reduce unexpected failures through planned inspection, service, adjustment, and replacement of components before breakdown occurs. A decline in unplanned downtime demonstrates that equipment availability and reliability are improving.

The number of maintenance work orders completed may indicate maintenance activity, but it does not by itself show whether failures have been prevented. Similarly, increasing spare-parts inventory or maintenance spending is not evidence of program effectiveness. See the Lean Enterprise Institute overview of total productive maintenance.

QUESTION NO: 3

The following problems were reported from the field:



Which of the following techniques could be used to solve these problems?

A. Tighten present tolerances

B. Analyze process control data

C. Establish supplier certification

D. Increase the inspection rate

ANSWER: B

Explanation:

Analyze process control data is the appropriate technique because field-reported problems should be investigated by connecting observed failures to evidence from the process that produced the product. Process-control data, including control charts, measurements, defect records, and process capability information, helps the organization determine whether variation is stable and inherent to the process or whether identifiable, assignable causes are present. This analysis provides a factual basis for locating when and where performance departed from requirements, identifying relationships between process conditions and field failures, and selecting corrective action that addresses the underlying source of variation. In an execution-and-control environment, this is essential feedback: quality information from customers and the field is used to evaluate process performance and drive continuous improvement. Statistical process control is specifically intended to monitor process behavior over time and detect meaningful changes requiring investigation. The National Institute of Standards and Technology describes control charts and related statistical methods as tools for monitoring and improving process quality; see NIST's Statistical Process Control overview. Further practical guidance on using control charts to distinguish process variation and support improvement is available from ASQ's control-chart resource.

QUESTION NO: 4

Which of the following topics is the most important training for lean team members?

A. Kanban

B. Problem solving

C. Single minute exchange of dies

D. Standard work

ANSWER: B

Explanation:

Problem solving is the most important foundational training for lean team members because lean depends on the capability of people closest to the work to identify abnormalities, understand causes, test countermeasures, and sustain improved processes. Continuous improvement is not a one-time implementation activity; it is a daily management discipline. Team members therefore need a shared, structured method for defining a problem, gathering facts at the source, analyzing root causes, selecting and testing countermeasures, checking results, and standardizing successful changes. This capability enables teams to improve quality, flow, delivery, cost, and safety as operating conditions change. It also supports the lean principle of developing people rather than relying exclusively on specialists to solve operational issues. ASCM's CPIM curriculum emphasizes the execution and improvement of operations, including continuous-improvement practices and problem resolution in production environments. The Lean Enterprise Institute similarly describes A3 thinking as a practical approach to problem solving, decision making, and continuous improvement. A strong problem-solving foundation allows lean methods to be applied thoughtfully and consistently in the actual work context. See ASCM CPIM certification information and Lean Enterprise Institute: A3 problem solving.

QUESTION NO: 5

A supplier of roller bearings makes lots of 10,000 and sorts them automatically according to size. In a typical lot of 10,000, the sizes break into the following categories:

{exhibit 1213}

The product requires rollers on target or, at most, 0.0001 oversize. Experience indicates that 100% must be reinspected before use because the machine inspection lets a few defective units slip through. The supplier should be encouraged to take which of the following actions?

A. Learn what factors cause variability.

B. Tighten the inspection criteria.

C. Seek deviations from Quality Control.

D. Doubly inspect the rollers

ANSWER: A

Explanation:

Learn what factors cause variability. is correct because the recurring need to reinspect an entire lot signals that the supplier's manufacturing process is not consistently capable of producing rollers within the required dimensional limits. The effective long-term quality action is to identify and control the sources of process variation, rather than depend on sorting to separate acceptable and unacceptable pieces after production. The supplier should investigate potential common and special causes, such as machine setup, tooling wear, material variation, environmental conditions, measurement-system capability, and operator methods. Statistical process control can help distinguish stable process variation from assignable causes and show whether the process is centered on the target and has adequate capability for the tolerance. Reducing variation at its source improves conformance, lowers the cost and risk associated with repeated inspection, and provides more reliable incoming material for the customer. This prevention-oriented approach reflects core quality-management practice: build quality into the process and use data to achieve a capable, controlled operation. See the ASQ overview of variation and the NIST resource on process capability indices.

QUESTION NO: 6

Based on the theory of constraints (TOC) scheduling approach, smaller lots created as a result of splitting order quantities are considered to be:

A. period order quantities.

B. bottleneck batches.

C. transfer batches.

D. campaign orders.

ANSWER: C

Explanation:

transfer batches. is correct because a transfer batch is the quantity moved from one operation or work center to the next before the entire order quantity has been completed. In TOC scheduling, an order may retain a larger process batch for efficiency at a resource, while being divided into smaller transfer batches to enable overlap between successive operations. This allows downstream work to begin as soon as the first portion is available rather than waiting for the full order to finish at the preceding operation.

This distinction is particularly valuable when managing flow around a constraint. Moving material in smaller transfer batches can reduce queue and lead time, improve the responsiveness of downstream operations, and help synchronize release and movement with the constraint's schedule. The transfer quantity is therefore a scheduling and material-movement decision, not necessarily the quantity processed in a single setup or run. APICS terminology distinguishes the batch processed at an

operation from the batch transferred between operations; TOC uses this capability to support continuous flow while protecting constraint performance. See the ASCM/APICS Dictionary resources and the TOC Institute for TOC concepts and terminology.

QUESTION NO: 7

In process improvement, which of the following procedures should be done first?

A. Assess employee productivity.

B. Analyze process variances.

C. Identify process steps.

D. Establish priorities for process change.

ANSWER: C

Explanation:

Identify process steps is correct because improvement begins by defining and understanding the current process—the "as-is" state—before attempting to measure, analyze, prioritize, or change it. Identifying the process's activities, sequence, inputs, outputs, handoffs, decision points, and responsible roles creates a shared, factual view of how work is actually performed. This baseline is commonly documented through a process map or flowchart. Once the steps are visible, the team can determine where to collect meaningful performance data, distinguish normal variation from special causes, locate delays or waste, and select improvement opportunities that align with operational priorities. Without a clearly defined process boundary and sequence, measures such as productivity or variance may be applied to the wrong activity or interpreted without the operational context needed for an effective corrective action. APICS-aligned process improvement relies on understanding the current state as the foundation for disciplined analysis and control, rather than beginning with a presumed solution. The American Society for Quality describes flowcharts as tools for mapping a process and understanding its sequence of steps: ASQ Flowchart Resource. The U.S. National Institute of Standards and Technology likewise identifies process mapping as a means to understand and document a process for improvement: NIST Improvement Tools.

QUESTION NO: 8

Operation-to-operation quantity reporting is most important to which of the following production environments?

A. Job-lot production

B. Process production

C. Repetitive manufacturing

D. Continuous manufacturing

ANSWER: A

Explanation:

Job-lot production is correct because work is produced in distinct, often low-volume orders that may follow unique routings through separate work centers. In this environment, reporting quantities as they are completed, moved, scrapped, or reworked at each operation provides the detailed shop-floor visibility needed to control individual jobs. The information updates work-in-process records, shows the job's current location and status, supports accurate remaining-operation scheduling, and permits labor, material, yield, and cost to be associated with the appropriate operation. Because job-lot work can vary substantially from order to order, managers need transaction-level feedback rather than relying primarily on aggregate production reporting. Operation-to-operation reporting also allows downstream operations to recognize when material is available and enables planners to identify delays or quality losses before the entire order is complete. This use of detailed routing and operation feedback aligns with the CPIM focus on executing and controlling work through the shop floor. ASCM identifies CPIM as covering the planning and execution activities used to manage production and inventory

operations; see ASCM's CPIM certification overview. Related APICS terminology and operations-management concepts are available through the ASCM APICS Dictionary.

QUESTION NO: 9

Which of the following basic layout principles should be applied to improve work flow?

A. Sequencing layouts for families of parts

B. Locating supermarkets near U-cells

C. Reducing number of machine tools

D. Increasing vertical part movement

ANSWER: A

Explanation:

Sequencing layouts for families of parts is correct because effective facility layout aligns the physical order of workstations with the processing sequence required by a product or part family. Grouping equipment and arranging it in routing order creates a more continuous flow, reducing travel distance, handoffs, queues, and opportunities for material to backtrack. This principle is central to cellular manufacturing: parts with similar processing requirements are assigned to a family, and the resources needed to make that family are located together in the sequence of operations. The resulting flow makes movement more visible and predictable, supports smaller lot sizes and faster feedback, and helps reduce work-in-process inventory and lead time. In operations planning and control, layout decisions should therefore facilitate the intended material flow rather than force material through disconnected functional areas. ASCM's terminology and learning resources describe the operations-management concepts underlying flow, routing, and cellular organization; see the ASCM APICS Dictionary. Additional practical guidance on designing manufacturing cells around product-family flow is available from the Lean Enterprise Institute.

QUESTION NO: 10

In a work center that requires a large number of tooling changes, the best way to increase productivity is to:

A. manage work center queue.

B. optimize run time.

C. reduce setup time.

D. implement theory of constraints.

ANSWER: C

Explanation:

reduce setup time. is correct because frequent tooling changes consume a significant share of the work center's available capacity. Setup time includes the activities required to change from one product, job, or operation to another, such as removing and installing tooling, making adjustments, verifying settings, and producing an acceptable first piece. Reducing this nonproductive time directly increases the time available for processing orders, improving effective capacity, throughput, schedule responsiveness, and often work-center utilization without requiring additional equipment or labor.

APICS operations-management practice emphasizes setup reduction as a key means of improving flow, particularly where small lot sizes, mixed-product production, or frequent changeovers are necessary. Techniques associated with single-minute exchange of die (SMED) distinguish tasks that must occur while equipment is stopped from those that can be performed externally before or after the changeover. Standardizing tooling, pre-staging materials and fixtures, and using quick-release mechanisms can reduce the duration and variability of each change. With many tooling changes, even a modest reduction per setup produces a substantial cumulative capacity gain. See Lean Enterprise Institute: SMED and ASQ: Setup Reduction.

QUESTION NO: 11

A work center's backlog has increased for several consecutive weeks. Which of the following conditions is most likely present?

A. Input has exceeded output

B. Output has exceeded input

C. Efficiency has exceeded 100%

D. Queue time has been eliminated

ANSWER: A

Explanation:

Input has exceeded output is correct. Backlog represents work released to or arriving at a work center that has not yet been completed. When backlog rises consistently, the work center is receiving more work than it is completing over the same periods.

Input/output control uses this relationship to monitor whether work-center flow is consistent with the plan. Corrective actions may include regulating order release, improving output, adding temporary capacity, or revising the production schedule.

QUESTION NO: 12

Which of the following project characteristics would suggest using the PERT technique, rather than the critical path method?

A. Estimates of individual task times are probabilistic.

B. Project tasks are backward scheduled.

C. Due dates are needed to identify critical tasks.

D. Project management can determine the critical path.

ANSWER: A

Explanation:

Estimates of individual task times are probabilistic. is correct because PERT (Program Evaluation and Review Technique) is designed for projects in which activity durations are uncertain. Rather than relying on one fixed duration for each activity, PERT uses three time estimates: optimistic, most likely, and pessimistic. These estimates are combined to calculate an expected activity duration, commonly using the weighted formula (optimistic + 4 × most likely + pessimistic) ÷ 6. This approach also enables evaluation of schedule uncertainty and, where needed, the likelihood of completing the project by a specified date. PERT is therefore particularly useful for nonroutine, innovative, development, or research work where historical duration data are limited and task completion times vary. Although a PERT network can still identify a critical path, its distinguishing characteristic is the treatment of activity-time estimates as variable or probabilistic rather than fixed. In contrast, the traditional critical path method is generally associated with deterministic activity durations and is most suitable when task-time estimates are reasonably reliable. See the ASCM project management terminology reference and the Project Management Institute overview of PERT.

QUESTION NO: 13

Which of the following approaches should improve a supplier's quality, price, and delivery performance?

A. Long-term commitments for capacity

B. Fixed warehouse storage locations

C. Secondary sources for components

D. Timely inspection of material

ANSWER: A

Explanation:

Long-term commitments for capacity is correct because a stable, continuing customer–supplier relationship gives the supplier a predictable demand signal and confidence that investments will be utilized. With committed capacity and a more reliable order horizon, the supplier can plan labor, materials, equipment, production schedules, and process-improvement work more effectively. This supports better delivery reliability by reducing avoidable capacity uncertainty and expediting. It can also improve quality because the supplier has an incentive and financial basis to invest in capable processes, prevention, training, and continuous improvement for the relationship. Price performance can improve as well: steadier volumes and lower uncertainty reduce administrative, scheduling, inventory, and change-related costs, enabling efficiencies that can be reflected in more competitive pricing. This is consistent with strategic supplier relationship management, in which buyers and suppliers collaborate over a longer horizon to create mutual value rather than transact solely order by order. ASCM describes supplier relationship management as managing supplier interactions to maximize value, including collaboration with key suppliers; see ASCM CPIM. The long-term partnership principle is also reflected in the Baldrige Excellence Framework, which emphasizes supplier partnerships and supply-network performance as contributors to organizational results.