

CMQ/OE Body of Knowledge

The topics in this new BOK include descriptive details (subtext) that will be used by the Exam Development Committee as guidelines for writing test questions. This subtext is also designed to help candidates prepare for the exam by identifying specific content within each topic that may be tested. The subtext is not intended to limit the subject matter or be all-inclusive of what might be covered in an exam but is intended to clarify how the topics relate to a Quality Manager's role. The descriptor in parentheses at the end of each entry refers to the maximum cognitive level at which the topic will be tested. A more complete description of cognitive levels is provided at the end of this document.

I. Leadership (25 Questions)

A. Organizational Structures and Culture

1. Organizational structures

Define and describe basic organizational designs: matrix, flat, parallel, etc., as well as the management hierarchy and its influence in an organization. (Understand)

2. Organizational culture

Define and describe characteristics of an organization that determine or underlie its culture. (Understand)

B. Leadership Challenges

1. Roles and responsibilities of leaders

Describe typical roles, responsibilities, and competencies of people in leadership positions and how those attributes influence an organization's direction and purpose. (Analyze)

2. Roles and responsibilities of managers

Describe typical roles, responsibilities, and competencies of people in management positions and how those attributes contribute to an organization's success. (Analyze)

3. Change management

Use various change management strategies to overcome organizational roadblocks and achieve desired change levels, and review outcomes for effectiveness. (Evaluate)

4. Motivating, influencing, negotiating, resolving

Apply techniques that support and sustain employee enthusiasm, and implement strategies that enable parties with different or opposing outlooks to recognize common goals and work together to achieve them. (Create)

5. Empowerment

Apply various techniques to empower individuals and teams, identify typical obstacles to empowerment and

appropriate strategies for overcoming them, and distinguish between various techniques used to achieve empowerment, such as job enrichment and job enlargement, job design and job tasks, etc. (Apply)

C. Teams and Team Processes

1. Types of teams

Identify different types of teams (e.g., process improvement, self-managed, temporary/ad hoc, work groups, cellular, special project) and their purpose. (Understand)

2. Stages of team development

Define and describe the classic stages of team development: forming, storming, norming, performing. (Apply)

3. Team-building techniques

Apply basic team-building steps such as holding an introductory meeting in which team members share information about themselves, using ice-breaker activities to enhance team membership, developing a common vision and agreement on team objectives, identifying and assigning specific roles on the team, etc. (Apply)

4. Team roles and responsibilities

Define and describe typical roles related to team support and effectiveness (e.g., facilitator, leader, process owner, champion, project manager, contributor, etc.) and responsibilities with regard to various group dynamics, such as recognizing hidden agendas, handling distractions and disruptive behavior, keeping on task, etc. (Analyze)

5. Team performance and evaluation

Evaluate teams in relation to established goals and objectives and determine when, why, and how to reward teams and celebrate their success. (Evaluate)

D. ASQ Code of Ethics

Identify and apply behaviors and actions that comply with this code. (Apply)

II. Strategic Plan Development and Deployment (15 Questions)

A. Strategic Planning Models

Define, describe, and use basic elements of systematic strategic planning models, including how mission, vision, and guiding principles relate to the plan. (Apply)

B. Business Environment Analysis

1. SWOT analysis

Analyze an organization's strengths, weaknesses, opportunities, and threats, and develop and prioritize actions to take as a result. (Analyze)

2. Market forces

Define and describe various forces that drive strategic plans including entry of new competitors, rivalry among existing competitors, threat of substitutes, bargaining power of buyers and suppliers, etc. (Apply)

3. Stakeholder analysis

Identify and differentiate the needs of various stakeholders to ensure alignment with the organization's strategic objectives. (Analyze)

4. Technology

Describe the effects that changes in technology can have on strategy formation. (Understand)

5. Internal capability analysis

Describe the effects an organization's internal capabilities (e.g., human resources, capacity, operational capabilities, etc.) can have on strategy formation. (Understand)

6. Legal and regulatory factors

Define and describe legal and regulatory factors that can influence strategy formation. (Understand)

C. Strategic Plan Deployment

1. Action plans

Identify basic characteristics of tactics (e.g., specific, measurable/quantifiable, timely, linked to strategic objective, etc.) for translating strategic objectives into action, and determine whether proposed plans meet these criteria. (Evaluate)

2. Resource allocation and deployment

Evaluate current resources to ensure they are available and deployed in support of strategic initiatives. Identify and eliminate administrative barriers to new initiatives. Ensure that all stakeholders understand the plan and have the skills necessary to carry out their responsibilities. Identify advocates/cheerleaders for the plan and assign them initial activities and leadership roles. (Evaluate)

3. **Organizational performance measurement**
Design and use performance measures to drive and monitor organizational performance, and evaluate the results in relation to the plan. (Create)

4. **Quality function in strategic deployment**
Represent the quality function in support of strategic plan deployment, and ensure that the voice of the customer is addressed throughout the process. (Create)

III. Management Elements and Methods (32 Questions)

A. Management Skills and Abilities

1. **Principles of management**
Define and apply basic management principles (e.g., planning, leading, delegating, controlling, organizing, staffing, etc.) in various situations. (Apply)

2. **Management theories, styles, and tools**
Define and describe classic studies such as MacGregor's Theory X and Y, Ouchi's Theory Z, Herzberg's two-factor theory, and other theories of management style, and describe how management styles are influenced by organization size, industry sector, competitive position, etc. Identify basic elements of behavior tools used by managers such as the Myers-Briggs type indicator, the dominance, influence, steadiness, conscientiousness (DiSC) model, etc. (Apply)

3. **Interdependence of functional areas**
Describe the interdependence of an organization's departments or functional areas such as human resources (HR), engineering, sales, marketing, finance, research and development (R&D), purchasing, information technology (IT), logistics, production, service, etc. (Understand)

4. **Human resources (HR) management**
Use basic HR management techniques for employee selection and professional development including coaching, setting goals and objectives, conducting performance evaluations, developing recognition programs, etc., and ensure that quality responsibilities are present in job descriptions throughout the organization. (Apply)

5. **Financial management**
Read, interpret, and use various finance tools including income statements, balance sheets, product/service cost structures, etc. Manage budgets, calculate return on investments (ROI) or assets (ROA), and use the language of cost/profitability to communicate with senior management. (Analyze)

6. **Risk management**
Describe and use basic techniques for risk identification, control, and mitigation. (Apply)

7. **Knowledge Management**

Use knowledge management techniques to identify and collect internal knowledge (core competencies) and best practices, to understand and share lessons learned, and to adapt and use such knowledge in new situations. Identify typical organizational hurdles that must be overcome in order to implement these techniques. (Apply)

B. **Communication Skills and Abilities**

1. **Communication basics**

Define communication and its role in organizations, including characteristics of a conducive communication environment and what factors inhibit communication. Describe nonverbal communication factors and what they convey. Use interpersonal skills (e.g., empathy, tact, open-mindedness, friendliness, etc.) and techniques (e.g., clear writing, active listening, open- and closed-questioning, etc.) to support effective communication. (Apply)

2. **Communications in a global economy**

Identify key challenges of communicating across different time zones, cultures, languages, and business practices, and identify ways of overcoming them. (Understand)

3. **Communications and technology**

Identify how technology has affected communications, including improved information availability, its negative influence on interpersonal communications, the new etiquette for electronic communications, etc. Use appropriate communication methods to deliver different kinds of messages in a variety of situations. (Analyze)

C. **Project Management**

1. **Project management tools**

Use benefit-cost analysis, potential return on investment (ROI), estimated return on assets (ROA), net present value (NPV), internal rate of return (IRR), portfolio analysis, risk assessment, etc., to analyze project risk, feasibility, and priority. (Analyze)

[NOTE: Calculations for ROI and ROA are covered in III. A. 5.]

2. **Project planning and estimation tools**

Use tools such as critical path method (CPM), Gantt chart, PERT, work breakdown structure (WBS), activity network diagram (AND), etc., to plan projects and estimate related costs. (Apply)

3. **Measure and monitor project activity**

Use tools such as cost variance analysis, milestones, actual vs. planned budgets, etc., to monitor project activity against project plan. (Evaluate)

4. **Project documentation**
Use written procedures, project summaries, lessons learned, etc., to document projects. (Apply)

D. **Quality System**

1. **Quality mission and policy**
Develop and monitor the quality mission and policy and ensure alignment with the organization's broader mission. (Create)

2. **Quality planning, deployment, and documentation**
Develop and deploy the quality plan and ensure that it is documented and accessible throughout the organization. (Create)

3. **Quality system effectiveness**
Use various tools to evaluate the effectiveness of the quality system, including balanced scorecard, skip-level meetings, management reviews, internal audits, feedback from internal and external customers, warranty data, traceability and product recall process reviews, etc. (Evaluate)

E. **Quality Models and Theories**

1. **MBNQA Criteria for Performance Excellence**
Define and describe how the Malcolm Baldrige National Quality Award (MBNQA) criteria are used as a management model in support of performance excellence. (Apply)

2. **ISO and other third-party standards**
Define and describe how ISO Standards can be used to support quality management systems. (Understand)

3. **Other quality methodologies**
Describe and differentiate programs such as total quality management (TQM), continuous quality improvement (CQI), six sigma, benchmarking, etc. (Apply)

4. **Quality philosophies**
Define and describe the basic methodologies and theories proposed by quality leaders such as Deming, Juran, Crosby, Feigenbaum, Ishikawa, and others. (Apply)

IV. **Quality Management Tools (28 Questions)**

A. **Problem-Solving Tools**

1. **The seven classic quality tools**

Select, interpret and apply these tools (Pareto charts, cause and effect diagrams, flowcharts, control charts, check sheets, scatter diagrams, histograms) in various situations. (Create)

2. **Basic management and planning tools**

Select, interpret and apply these tools (affinity diagrams, tree diagrams, process decision program charts (PDPCs), matrix diagrams, interrelationship digraphs, prioritization matrices, activity network diagrams) in various situations. (Evaluate)

3. **Process improvement tools**

Select, interpret and apply tools such as root cause analysis, PDCA, six sigma DMAIC model, failure mode and effects analysis (FMEA), statistical process control (SPC), in various situations. (Evaluate)

4. **Innovation and creativity tools**

Use various techniques and exercises for creative decision-making and problem-solving, including brainstorming, mind mapping, lateral thinking, critical thinking, design for six sigma (DFSS), etc. (Apply)

5. **Cost of quality (COQ)**

Define and distinguish between prevention, appraisal, internal, and external failure cost categories and the impact that changes in one category will have on the others. (Evaluate)

B. **Process Management**

1. **Process goals**

Describe how process goals are established, monitored, and measured and what impact they will have on product or service quality. (Evaluate)

2. **Process analysis**

Use process mapping, flowcharting, and other visual aids to analyze a process and compare it to written procedures, work instructions, and other documents. (Evaluate)

3. **Lean tools**

Identify and apply lean tools and processes such as cycle-time reduction, 5 Ss, just-in-time (JIT), kanban, value streams, etc. (Understand)

4. **Theory of constraints (TOC)**
Define key concepts of TOC including local vs. system optimization, physical vs. policy constraints, throughput, etc., and classify various types of constraints such as finite resources, increased expectations, etc. (Understand)

C. **Measurement: Assessment and Metrics**

1. **Basic statistical use**
Use techniques such as the goal-question-metric (GQM) model and others to identify when, what, and how to measure projects and processes. Describe how metrics and data gathering methods affect people and vice-versa. (Apply)
2. **Sampling**
Define and describe basic sampling techniques (e.g., random, stratified, etc.) and when sampling is appropriate. (Understand)
3. **Statistical analysis**
Apply basic statistical techniques (e.g., measures of central tendency, range, variance, types of distribution, check sheet output) to data sets, charts, and other data summaries to monitor processes and make data-based decisions. (Evaluate)
[NOTE: Statistical process control (SPC) applications are covered in IV. A. 3.]
4. **Trend and pattern analysis**
Read and interpret data sets, graphs, charts, etc., and identify various trends such as cyclical, seasonal, environmental, etc., and patterns such as shifts, etc. (Evaluate)
5. **Theory of variation**
Differentiate between common and special causes of variation. (Analyze)
6. **Process capability**
Determine the capability of a process in terms of Cp and Cpk indices. (Evaluate)
7. **Reliability and validity**
Use measurement theories of reliability and validity (including content-, construct-, and criterion-based measures) to guide the development of survey instruments and to support inferences about the data gathered by them. (Analyze)

8. **Qualitative assessment**
Identify subjective measures (e.g., verbatim comments from customers, observation records, focus group output) and how they differ from objective measures, and determine when measurements should be made in categories rather than in terms of numeric value. (Analyze)

9. **Survey analysis and use**
Analyze survey results and ensure that they are interpreted and used correctly. (Analyze)

V. **Customer-Focused Organizations (20 Questions)**

A. **Customer Identification and Segmentation**

1. **Internal customers**
Define and describe the impact an organization's treatment of internal customers will have on external customers, and develop methods for energizing internal customers to improve products, processes, and services. (Evaluate)

2. **External customers**
Define and describe external customers and their impact on products and services, and develop strategies for working with them to improve products, services, and internal processes. (Evaluate)

B. **Customer Relationship Management**

1. **Customer needs**
Use various tools and techniques to identify and prioritize customer needs and expectations, including the voice of customer, house of quality, quality function deployment (QFD), focus groups, customer surveys, etc. (Analyze)

2. **Customer satisfaction and loyalty**
Develop systems to capture customer perceptions and experiences using a variety of feedback mechanisms (e.g., complaints, surveys, interviews, guarantee/warranty data), and use customer value analysis, corrective actions, etc., to measure and improve satisfaction. Describe ways of measuring the value of existing customers and the financial impact of losing customers. (Create)

3. **Basic customer service principles**
Describe and develop strategies for deploying and supporting principles such as courtesy, politeness, smiles, attention to detail, rapid response, etc. (Apply)

4. **Multiple and diverse customer management**
Establish and monitor priorities to avoid and resolve conflicting customer requirements and demands, and develop methods and systems for managing capacity and resources to meet the needs of multiple customers.

Describe the impact that diverse customer groups can have on all aspects of product and service development and delivery. (Evaluate)

VI. Supply Chain Management (15 Questions)

A. Supplier Selection

Define and develop selection criteria such as rating programs, external certification standards, etc., and identify and manage their impact on various internal processes of the organization. (Evaluate)

B. Supplier Communications

Design and implement techniques for communicating with suppliers including scheduled meetings, routine and emergency reporting procedures, presenting explicit expectations, confirming awareness of criticality, etc. (Create)

C. Supplier Performance

Define and describe common measures of supplier performance (e.g., quality, price, delivery, service levels) and metrics (e.g., defect rates, functional performance, timeliness, responsiveness, availability of technical support). (Create)

D. Supplier Improvement

Design and conduct supplier audits, evaluate corrective and preventive action plans, provide feedback, and monitor for process improvement. (Create)

E. Supplier Certification, Partnerships, and Alliances

Design and implement supplier certification programs, including process reviews and performance evaluations, and identify strategies for developing customer-supplier partnerships and alliances. (Evaluate)

F. Supplier Logistics

Describe the impact purchased products and services have on final product assembly or total service package, including ship-to-stock, just-in-time (JIT), etc. (Understand)

VII. Training and Development (15 Questions)

A. Training Plans

Develop and implement training plans that are aligned with the organization's strategic plan and general business needs. (Apply)

B. Needs Analysis

Use various tools and techniques to develop and implement training needs analysis. (Apply)

C. Training Materials/Curriculum Development and Delivery

Use various tools, resources, and methodologies to develop training materials and curricula that address adult learning principles and the learning needs of an increasingly diverse workforce. Describe various methods to deliver training, including classroom style, workbooks, simulations, on-the-job, self-directed, etc. (Apply)

D. Training Effectiveness and Evaluation

Describe and implement various ways of measuring training effectiveness, including customer feedback from training sessions, end-of-course test results, on-the-job behavior/ performance change, departmental or area performance improvements. (Apply)

Topics for the Constructed-Response (Essay) Portion of the Manager of Quality/Organizational Excellence Exam

Candidates will be presented with three open-ended questions from which they can select the two that they prefer to answer. Candidates will have 45 minutes in which to write responses to the two chosen situations. *Prior to the start of the constructed-response portion of the exam, candidates will be given 5 minutes to review and select their situations.* Candidates may split their time spent on the problems as they like. Their responses will be graded on their knowledge of quality management as it relates to the content areas listed below and in the following skills and abilities: communication, critical-thinking, personnel management, general management.

CR-1. Leadership

Demonstrate knowledge of the quality manager's role in organizational leadership and as quality champion and customer advocate. Deploy change agent strategies in support of organization-wide continuous improvement efforts. Develop teams and participate on them in various roles.

CR-2. Strategy Development and Deployment

Develop and maintain organizational focus on the importance of quality and performance excellence. Create quality policies and procedures in support of the strategic plan, and integrate those policies and processes into the tactics developed to support the strategic plan.

CR-3. Management

Demonstrate management abilities in human resources, financial, risk, and knowledge management applications. Use effective communication methods in various situations to support continuous improvement efforts. Select and use appropriate tools and methodologies to plan, implement, and evaluate projects. Develop, deploy, and evaluate quality plans that can be used throughout the organization. Evaluate and recommend appropriate quality models or systems to implement in various situations.

CR-4. Customer Focus

Identify and segment customers using a variety of criteria and tools. Identify and prioritize product or service design and development on the basis of customer requirements and feedback. Solicit customer input proactively and combine with market analysis and other research to achieve organizational goals, etc. Use customer expectations and feedback to manage continuous improvement projects.

CR-5. Supplier Management

Develop and implement supplier management systems from selection process through partnership agreements. Identify methods for assessing supplier performance at various levels of customer-supplier relationships.

CR-6. Training and Development

Demonstrate knowledge and ability in developing, implementing, and evaluating needs assessment, training delivery methods, and outcomes of training efforts.

**Levels of Cognition
based on Bloom's Taxonomy ? Revised (2001)**

In addition to **content** specifics, the subtext for each topic in this BOK also indicates the intended **complexity level** of the test questions for that topic. These levels are based on ?Levels of Cognition? (from Bloom's Taxonomy ? Revised, 2001) and are presented below in rank order, from least complex to most complex.

Remember (Knowledge Level)

Recall or recognize terms, definitions, facts, ideas, materials, patterns, sequences, methods, principles, etc.

Understand (Comprehension Level)

Read and understand descriptions, communications, reports, tables, diagrams, directions, regulations, etc.

Apply (Application Level)

Know when and how to use ideas, procedures, methods, formulas, principles, theories, etc.

Analyze (Analysis Level)

Break down information into its constituent parts and recognize their relationship to one another and how they are organized; identify sublevel factors or salient data from a complex scenario.

Evaluate (Evaluation Level)

Make judgments about the value of proposed ideas, solutions, etc., by comparing the proposal to specific criteria or standards.

Create (Synthesis Level)

Put parts or elements together in such a way as to reveal a pattern or structure not clearly there before; identify which data or information from a complex set is appropriate to examine further or from which supported conclusions can be drawn.