

■ Information Technology Engineers Examination —————

Project Manager Examination

(Level 4)

Syllabus

— Details of Knowledge and Skills Required for
the Information Technology Engineers Examination —

Version 4.1

The logo for the Information Technology Promotion Agency (IPA) of Japan, consisting of the letters 'IPA' in a bold, red, sans-serif font.

INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

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Major category	Minor category	Outline	Required knowledge	Required skills
1 Project Initiation	1-1 Preparation of an individual computerization plan for information systems or embedded systems (hereinafter referred to as systems)	<p>A project is a set of fixed-term activities conducted for achieving a specified goal.</p> <p>When an IT strategist creates an individual computerization plan to obtain approval for a system development project, present the significance of the project, and support the documentation of resource usage and promotion scheme.</p> <p>The individual computerization plan should outline the purpose, goal, positioning, deliverables, milestones, budget/cost, and necessary resources of the project. In addition, it should describe issues on project implementation and management, risks, and external factors affecting the project.</p>	<ul style="list-style-type: none"> • Fundamentals of the organization's situation • Fundamentals of the organization's system strategy • Fundamentals of the organization's overall computerization plan • Project • Project organization • Project budget/cost • Project resources • Project schedules • Project risks • Description style of individual computerization plans • Documentation 	<ul style="list-style-type: none"> • Recognizing the significance of a project from the state of the organization and its management policy, as well as its relationship with competing and associated organizations • Planning a feasible project • Creating an individual computerization plan in accordance with trends in information technology (including IoT, big data, AI, etc.) • Concisely summarizing the contents of an individual computerization plan • Expressing priority matters of an individual computerization plan to the stakeholders in an easy-to-understand manner • Understanding advice from the stakeholders when creating an individual computerization plan • Explaining the contents of an individual computerization plan to the approver
	1-2 Submission and approval of an individual computerization plan	<p>When an IT strategist submits an individual computerization plan to an organization that reviews and approves it (hereinafter referred to as the approval organization), and explains the plan details according to the requests of the person responsible for approval, complement the IT strategist's explanations as necessary.</p> <p>Support the IT strategist's activities to obtain approval for the plan, through validation by the approval organization.</p>	<ul style="list-style-type: none"> • Fundamentals of the organization's situation • Approval organization of the individual computerization plan • Fundamentals of presentation techniques 	<ul style="list-style-type: none"> • Logically explaining priority issues in an individual computerization plan • Understanding the meaning of questions from the person responsible for approval or persons in charge of the individual computerization plan, and responding appropriately to them

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	1-3 Completion of an individual computerization plan	<p>After evaluating the sufficiency of the plan contents with regard to the evaluation criteria, the approval organization of the individual computerization plan may impose some constraints or conditions on the plan if necessary, in consideration of the budget limit for the organization, the desired completion date, necessary quality level, and available amount of resources. Support the IT strategist when he/she judges whether or not the imposed constraints become a major obstacle to the plan and makes adjustments with the approval organization of the individual computerization plan as needed.</p> <p>The project is approved by the approval organization of the individual computerization plan after going through its review. Then, the project manager is appointed by a senior manager of the information systems department. At the same time, the role, duties, and privileges of the project manager are clarified. This individual computerization plan will become the initial requirements for project planning phases thereafter.</p>	<ul style="list-style-type: none"> • Documentation 	<ul style="list-style-type: none"> • Accurately understanding matters pointed out by the person responsible for approval or persons in charge of the individual computerization plan • Creating an alternative plan in response to constraints imposed by the person responsible for approval or persons in charge of the individual computerization plan

Note 1: This syllabus assumes that a system development project is drafted as a project for a system to be developed and used within the organization. However, a system development company may initiate a project in response to a proposal request from a customer organization. In such a case, the terms used in this “Project Initiation” will need to be alternated, for example, as “procurement manager of the customer organization” in place of “approval organization of the individual computerization plan” and “sales manager of the proposing company” in place of “IT strategist.”

Note 2: The positioning and authority of an approval organization of individual computerization plans, as well as the responsibility scope and authority of a senior manager are different depending on the organization. This syllabus assumes that approval of a project is delegated to the approval organization of the individual computerization plan, and that appointment of the project manager is delegated to the senior manager of the information system department by the top management of the organization.

Note 3: Here, it is assumed that, in the preparation phase of the individual computerization plan, the project manager candidate provides advice, etc. in response to requests by the IT strategist. The project manager may be appointed after the individual computerization plan is approved. In such cases, different types of people may take charge of the tasks mentioned in “1. Project Initiation.”

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2 Project Planning	2-1 Creating a project charter	Clarify the requirements of stakeholders, project background and purpose, goals to be achieved in the project, problems to be resolved, role and duties of the project managers and project teams, and policy and rules to control projects. In addition, clarify the project scope, constraints and assumptions for project, rough schedule, and budget, and then document them as a project charter.	<ul style="list-style-type: none"> • Individual computerization plan • Requirements • Project control • Project schedule • Project budget • Quality of deliverables and processes • Stakeholders in the project within the organization • Project risks • Responsibilities and authority of project managers • Documentation 	<ul style="list-style-type: none"> • Understanding the fundamental requirements of an individual computerization plan • Drawing the overall picture of a system development project • Collecting and determining the requirements • Structurally understanding system development work • Identifying risks and constraints • Identifying stakeholders • Rationally explaining the project charter to the stakeholders • Understanding conflicting opinions
	2-2 Defining the system development policy	Considering system development characteristics, appropriate work efficiency, budget, period, and quality, determine the system development lifecycle model, software development method, development environment, and development standards (quality assurance, configuration management, documentation, etc.) that are suitable for the development of the target system.	<ul style="list-style-type: none"> • System development lifecycle models and their application • Software development methods • Development environments • International standards, national standards, and organizational standards related to system development • System quality assurance • Configuration management • Documentation in system development 	<ul style="list-style-type: none"> • Understanding the characteristics of the systems to be developed • Applying the system development lifecycle model • Selecting a development standard suitable for the project characteristics • Presenting an optimum resolution policy for the development issues for the target system Rationally explaining the development policy • Understanding conflicting opinions
	2-3 Scope definition	As the final state of the project, define objectives, deliverables, and requirements as a project scope and then document them as a scope description. Next, based on the deliverables, hierarchically break down the project work into the smaller components that are performed in each phase constituting the project life cycle, and create a WBS (Work Breakdown Structure). For each WP (Work Package) which is the minimum unit for broken down components, set the work details and deliverables. Based on WP, identify the work that should be set in the schedule, define as an activity, and create an activity list.	<ul style="list-style-type: none"> • Project life cycle • Phases that make up the project life cycle • Structure of the project work • Techniques for breaking down project work • Stepwise refinement • Documentation 	<ul style="list-style-type: none"> • Making up a project life cycle using appropriate phases • Identifying project deliverables • Hierarchically breaking down project work • Identifying WPs • Analyzing relationships between WPs • Rationally explaining the scope definition to the stakeholders • Understanding conflicting opinions

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	2-4 Scheduling	<p>Identify logical relationship between project activities, and determine the order in which the activities are conducted. Then, estimate the activity duration that is required to complete each activity.</p> <p>For scheduling, set the baseline of the entire project schedule by calculating the starting time and ending time of each activity. In addition, make necessary allowances, seek to shorten the execution period in a logically feasible manner and to level the resources, and document them as the schedule.</p>	<ul style="list-style-type: none"> • Structure of the project work • Activity chart representation of the project work • Techniques for breaking down project work • Order of activities • Estimating activity duration • Calculation of the critical path and critical chain • Priority of activities, leads, lags, and constraints • Scheduling baseline • Scheduling support software • Documentation 	<ul style="list-style-type: none"> • Drawing the workflow of the entire project • Setting project milestones • Schematically expressing and analyzing relationships between activities • Determining the order in which the activities are conducted so that the logical and physical conditions are satisfied. • Identifying the factors (e.g. a reference value for productivity) for estimating the activity duration, and estimating the period required • Planning to level out the allocation of feasible resources and to shorten the execution period • Considering scheduling risks • Rationally explaining the schedule to the stakeholders • Understanding conflicting opinions
	2-5 Resource estimate	<p>Estimate and decide the resources required for each activity, such as persons, facilities, equipment, materials, infrastructure, and tools. Then, determine the appropriate amount and timing of each resource.</p> <p>Document them as the resource plan.</p>	<ul style="list-style-type: none"> • Skills required for project implementation and management • Facilities, equipment, materials, and infrastructure • System development environment and tools • Estimate of the project workload, productivity, and person-hours • Personal skill information in the organization • Resource planning support software • Documentation 	<ul style="list-style-type: none"> • Identifying necessary resources to each activity, and allocating them • Setting the timing and quantity of efficient resource allocation • Identifying resource commitment risks • Rationally explaining the resource plan to the stakeholders • Understanding conflicting opinions

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	2-6 Project organization decision	<p>Taking the project direction and characteristics into consideration, form a project team, identify the roles, duties, and authority of the project team, and then decide the project organization that controls the project. Select members who can reliably implement and manage the project, assign them to WPs, and clarify their responsibilities and privileges. The framework that conducts such an organization and controls them is called project governance.</p> <p>The staff members consist of those who join the project full-time and those who conduct partial work for the project. When necessary, consign part of the development work to external organizations or engineers who are not part of the project, or ask for their cooperation such as provision of information, technical consulting, and reviews. Also, create staff education and training plans. Document them as the organization chart of the project.</p>	<ul style="list-style-type: none"> • Project team formation • Project organization and control • Skills required for project execution • Fundamentals of project governance • Communication method for projects • Staff education and training • Fundamentals relating to human aspects or organization such as leadership and motivation • Fundamentals of labor management, such as the Labor Standards Act • Documentation 	<ul style="list-style-type: none"> • Forming a project team that is most suitable for the project characteristics • Defining requirements for potential staff such as abilities, qualifications, and aptitude • Selecting staff • Evaluating the abilities, qualifications, and aptitude of the potential staff • Appropriately assigning staff members, their responsibilities, and privileges to WPs • Constructing an appropriate governance for the project • Establishing a communication method suitable for the project • Considering staff commitment risks • Rationally explaining the project organization to the stakeholders • Understanding conflicting opinions
	2-7 Procurement plan and supplier selection	<p>Making a plan of the organization's procurement strategy and procurement processes, and document them as a procurement planning.</p> <p>Consider working efficiency, available staff, and budget, and create the procurement specifications and requirements for obtaining system development staff, products, and services from suppliers.</p> <p>Collect information from suppliers according to the procurement specifications and the requirements, determine the methods of supplier selection, and then document them as the contracts or orders and the selected suppliers list.</p>	<ul style="list-style-type: none"> • Procurement type of system development procurement (undertaking, mandate, dispatch, SI, outsourcing, alliance, etc.) • Suppliers • An organization's selection standards for suppliers • RFP (Request For Proposal) • Procurement specifications and requirements • Inquiries • SLA • Fundamentals of contract types • Fundamentals of compliance • Fundamentals of confidentiality • Fundamentals of intellectual property rights • Fundamentals of overseas procurement • Documentation 	<ul style="list-style-type: none"> • Judging whether to procure from suppliers • Identifying procurement assumptions and constraints • Appropriately applying an organization's procurement standards • With project characteristics in consideration, identifying parts to be internally manufactured parts and those to be procured from suppliers • Creating appropriate procurement specifications and requirements • With project characteristics in consideration, configuring the optimum combination of forms of transaction • Considering procurement risks • Rationally explaining the procurement plan to the stakeholders in evaluation • Understanding conflicting opinions

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	2-8 Cost estimate	<p>For each activity, estimate the total costs for the overall project on the basis of the quantities and unit costs of necessary staff and resources, and then specify miscellaneous expenses necessary for project promotion, and contingency costs for risks, etc.</p> <p>Verify the total cost considering the budgetary limitations and the organization's budget determination policy given when the project was started. Use them to determine the project's initial plan cost, and document it as the cost estimate.</p> <p>Distribute the total cost for the project that is decided by the cost estimate, and develop the budget. Determine where and when costs will be expended, and establishes a baseline whereby cost performance can be managed.</p>	<ul style="list-style-type: none"> • Market prices and actual prices of staff and resources • Cost estimate • Items for cost estimate • Models for estimating system development costs • Techniques for estimating system development costs • Models for estimating project-related costs • Techniques for estimating project-related costs • Cost estimate support software • Budget development by distributing total cost • Estimate for contingency costs and allowance • Cost baseline • Documentation 	<ul style="list-style-type: none"> • Estimating necessary costs for each activity • Balancing cost-related total optimization and partial optimization • Considering cost estimate risks • Rationally explaining the cost estimate to the-stakeholders • Appropriately distributing total cost to activities • Dealing with the possibilities of risks or uncertainties • Understanding conflicting opinions
	2-9 Quality plan	<p>First clarify the quality requirements and standards applied for the project and project deliverables. Then, considering the quality requirements specified in the organization's quality policy and the individual computerization plan, determine the project quality objectives and quality management items. In addition, determine the metrics for quality management methodology, quality assurance implementation procedures, and quality evaluation, and then confirm consistency with the development standards. As well, plan configuration management which is closely related to quality assurance. Determine methodologies, techniques, and resources to implement the quality activities. Finally, confirm their validity as quality assurance measures and document them as a quality plan.</p>	<ul style="list-style-type: none"> • Organization's quality policy • Quality management methodologies • Quality assurance procedure for each process of system development • Differences in specifications, defects, and failures of the system • Quality=requirements for the project • Reviews and tests for the system • Metrics for quality evaluation • Verification methods for quality • Quality verification tools, procedures, techniques, and resources • Configuration management • Documentation 	<ul style="list-style-type: none"> • Evaluating quality requirements • Constructing an appropriate quality assurance procedure and quality management method suitable for the project characteristics • Understanding the quality requirements for the project, and clarifying the quality objectives • Selecting the quality assurance technique to confirm user satisfaction, such as prototyping • Evaluating the trade-off between costs spent to ensure quality and quality improvement effects • Rationally explaining the quality objectives and quality requirements to the stakeholders • Understanding conflicting opinions

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	2-10 Risk identification and risk assessment	<p>Identify risk events and their characteristics that may have a positive or negative impact on the project objectives in the project life cycle. The risk identification process should involve multiple stakeholders. Identified risks should be registered in the risk register. Evaluate identified risks in terms of the probability of occurrence and the impact on quality, associated cost, and delivery date. On this basis, estimate work to lower the probability of occurrence and necessary resources, and create risk response plans to minimize impact when they occur. Define the priority of risk countermeasures, determine preventive measures and estimate the workload, and then include them in the schedule. In addition, determine a contingency plan for risk occurrence and its trigger conditions.</p>	<ul style="list-style-type: none"> • Possible risks in the project • Impact of risk occurrence • Risk management methods • Qualitative risk analysis techniques • Quantitative risk analysis techniques • Risk evaluation • Risk prevention measures • Risk response (avoidance, reduction, transfer, acceptance) • Information security • Contingency plan • Cost for preventive measures • Documentation 	<ul style="list-style-type: none"> • Identifying risks assumed from project characteristics • Projecting the impact of risks • Estimating risk occurrence probability • Evaluating the trade-off between costs spent on risk prevention measures and the contingency plan and the impact of risks • Creating a contingency plan • Rationally explaining the risk response plan to the stakeholders • Understanding conflicting opinions

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	2-11 Preparation of the project plan	<p>Coordinate all plans, integrate them as a consistent and feasible plan, and document them as a project plan.</p> <p>In the project plan, clearly describe the communication plan including the following: the target values and target scopes as various management indexes, the baseline to perform the project, the overview of the project management that apply method, tools, and techniques to proceed with the plan as scheduled, the project environment that affects the project, how to respond to change requests, how to confirm the completion of the project phases, measurement method of project post-completion evaluation index, user receiving inspection method for deliverables, how to confirm the completion of the project, the method for distributing information such as progress reports to the stakeholders. Submit the created project plan to the senior manager for approval.</p> <p>The senior manager should evaluate the details together with the stakeholders and determine whether or not to approve the project execution.</p> <p>In the project plan, describe an overview of project post-completion evaluation indexes to conduct an overall evaluation after project completion.</p>	<ul style="list-style-type: none"> • Project properties (fixed term, identity, stepwise refinement) • Project management • Various project management indexes • Project scope • Project schedule • Project resources • Roles and responsibilities of project team members • Project cost • Procurement from suppliers • Project quality assurance • Project risks • Project environment • Change management • Project and project phase completion criteria • Organization's standard project completion achievement indexes • Documentation 	<ul style="list-style-type: none"> • Comprehensively coordinating all plan elements related to the project and resolving conflicts between plan elements • Determining conformity to the requirements of the individual computerization plan • Evaluating project feasibility • Setting appropriate target values and target scopes to various management indexes • Applying a monitoring method suitable for the project characteristics • Developing the change management process • Clarifying deliverables from each process • With consideration to the project purpose and goal, defining a general outline of post-completion evaluation indexes used as a basis for completion evaluation • Rationally explaining the project plan to the stakeholders • Understanding conflicting opinions

Note 1: It is defined that the first tasks in a project are to create the project charter, formulate the system development policy, and define the scope. After these, tasks from 2-4 through 2-10 will be performed in parallel while maintaining consistency with each other.

Note 2: Note that the cost estimate and quality plans may be created in different ways depending on whether the project is planned internally within the organization or is a consigned project. For example, a system development company may have to estimate costs, not simply by accumulating necessary costs, but by considering a company's specific budget calculation policy or its corporate strategy. The company may also have to define quality objectives focusing on user satisfaction and usability.

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3 Project Implementation and Control	3-1 Direction of project work	This is the process where the project manager should exhibit his or her own best performance. Direct project work including the scope, schedule, resource usage, cost, quality, organizational operations, staff, procurement, and risks in project operations so that the project, as individual activities and as a whole, can progress smoothly; perform work that is defined in the project plan; and create project deliverables.	<ul style="list-style-type: none"> • Project plans • Scope control • Schedule control • Resource control • Cost control • Quality control • Project team management • Procurement management • Risk control • Stakeholder management • Project implementation management support software 	<ul style="list-style-type: none"> • Identifying, analyzing, and evaluating the cause of differences between a project plan and work result to plan and implement measures • Feeding back results-detailed for each step based on project progress to the project plan • Projecting the impact that individual problems could have on the entire progress • Maintaining the balance of the entire progress • Appropriately evaluating the current situation against project purpose and goal • Identifying unexpected new risks
	3-2 Project work control	<p>Measure the implementation status of project work, appropriately understand the contents, and monitor for signs or phenomenon that interfere with plan implementation. If abnormality is found or is projected, trace the cause and improve it.</p> <p>Define the frequency of monitoring according to the project scale, complexity, or risk. Although basically every abnormality should be found in this work, especially focus on the monitoring and tracking of the scope, schedule, quality, cost, and risk.</p>	<ul style="list-style-type: none"> • Collection of the implementation status data of project work • Maintenance and evaluation of scope • Evaluation of schedule progress • Quality evaluation • Evaluation of resource allocation status • Evaluation of resulting costs • Progress measurement tools (trend chart, EVM, etc.) 	<ul style="list-style-type: none"> • Collecting and analyzing appropriate data related to project progress, and identifying problems • Evaluating the validity of the frequency of planned monitoring and tracking • Making use of progress measurement tools appropriately in accordance with the project characteristics • Evaluating the impact of plan changes, and prioritizing responses

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	3-3 Scope control	<p>In scope control, maximize positive impacts of scope changes, and minimize negative impacts.</p> <p>Compare the present scope to the approved scope to determine any discrepancy. For those with little impact on project operations, consider countermeasures considering them as problems within the project scope. Estimate the required workload and resources, determine the impact, and resolve the problem.</p> <p>For a discrepancy which requires a change to the plan, change the project plan according to the change management procedure, obtain approval from the stakeholders, and then implement the changes.</p>	<ul style="list-style-type: none"> • Procedures to present scope changes and management of presented scope changes • Evaluation of the impact of scope changes • Required work and resources for scope changes • Evaluation of the level of the impact of scope changes • Approvals by the stakeholders 	<ul style="list-style-type: none"> • Judging the significance of a presented scope changes • Evaluating the level of the impact of scope changes on the project • Estimating the required workload and resources for scope changes • Collecting information for scope changes • Rationally explaining scope changes to the stakeholders and obtaining the approval
	3-4 Closure of project phases	<p>Upon completion of each project process and activity defined in the schedule, evaluate the work results and the quality of deliverables. Also, evaluate the ability of project teams and staff, cooperative framework, communication, and project management methods.</p> <p>For items which did not produce desirable results, create improvement plans for phases thereafter, and make use of the evaluation results to achieve better results.</p> <p>Confirm the above items at the phase completion evaluation, and from the stakeholders, obtain approval for the completion of the current phase and start of the next phase.</p>	<ul style="list-style-type: none"> • Evaluation points of processes and activities • Evaluation of project management methods • Quality evaluation of the deliverables • Project phase achievement evaluation and analysis • Conditions for the start of the next phase 	<ul style="list-style-type: none"> • Planning and conducting the project phase completion evaluation • Hearing opinions at the completion evaluation • Collecting, summarizing, analyzing, and evaluating information that contribute to project phase evaluation • Creating and executing an improvement plan based on the evaluation result • Evaluating improvement effects • Appropriately explaining the completion of a project phase and start of the next phase to the stakeholders in order to obtain approval

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	3-5 Management of stakeholders and communications	<p>Identify and manage concerns of the stakeholders so that the needs of the stakeholders are satisfied by communicating the project status accurately and appropriately through the distribution of information or the holding of briefing sessions. With a focus on performance reports for plans concerning the scope, quality, cost, schedule, and risk, projections on deviations from the plan, the status of resolving problems which have occurred, and the results of responding to change requests should be reported as priority matters.</p> <p>Also, in order to satisfy the communication needs of the stakeholders, respond to a problem appropriately when it occurs. To do so, increase the understanding and cooperation among the various stakeholders, provide timely and accurate information, and minimize the risk that the project is negatively affected by misunderstandings of the stakeholders.</p>	<ul style="list-style-type: none"> • Project report criteria • Analysis of problems impacts and their resolutions • Power/influence of stakeholders • Information distribution • Fundamentals of communication • Fundamentals of presentation • Fundamentals of reporting and documentation for internal control 	<ul style="list-style-type: none"> • Analyzing and evaluating the project status • Reporting future prospects of the project • Accurately and appropriately reporting project status without omitting priority matters • Identifying concerns of the stakeholders and appropriately responding to them • Accurately grasping project issues • Proposing an alternative plan when changing the project plan, and prompting judgment and decision-making from the stakeholders and senior managers. • Recognizing the scope of responsibility for the project • Evaluating the validity of the project achievements • Evaluating the effectiveness of project post-completion evaluation indexes • Understanding conflicting opinions
	3-6 Schedule control	<p>Evaluate the costs, resources, and yield and quality of deliverables during a certain period, check the progress against the schedule, and take appropriate actions if there is any variance comparing to the schedule.</p> <p>Forecast the progress to project completion, and if a delay is occurring, forecast the completion date and develop measures such as changing the schedule or adding staff and resources. According to these measures, reevaluate the cost and completion period, consult the senior manager, and then change the plan as necessary.</p>	<ul style="list-style-type: none"> • Actual progress data • Method for forecasting completion date • Change management procedures • Schedule compression techniques • Forecasting completion date of activities • Progress management support software 	<ul style="list-style-type: none"> • Estimating the impact of a partial delay on the project • Restoring overall balance with respect to imbalanced progress • Analyzing the cause of progress delay • Planning and adding staff and resources with respect to a delay • Creating an alternative schedule for a delay • Forecasting the completion date

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	3-7 Resource control	<p>Ensure the planned resources and assign according to the plan. Moreover, evaluate resources allocated during a certain period, and check the allocation status, timing, qualitative and quantitative sufficiency against the resource estimate.</p> <p>Forecast the progress to project completion, and if impact due to resource shortage is anticipated, develop measures for resource requirements. Based on these measures, consult the senior manager and reevaluate the cost and completion period, obtain the approval of the senior manager, and then reallocate the resources as necessary.</p>	<ul style="list-style-type: none"> • Ensuring resources • Resource allocation • Evaluation of resource utilization status • Resource requirement • Resource usage limit • Resource reallocation • Resource management support software 	<ul style="list-style-type: none"> • Ensuring the required resources and allocating them appropriately according to the plan • Analyzing a tendency in a difference between an actual use of resources and a plan • Analyzing the cause of resource excess or shortage • Estimating the impact of resource requirements • Understanding the relationship between resources and project productivity • Planning resource reallocation • Managing types of usage to optimize resource usage
	3-8 Project team development and project team management	<p>Try to improve the overall effect by unifying project teams, as well as developing them to have vitality and initiative. For this purpose, allocate costs and time for necessary education and training to improve the abilities of the staff and teams. Also, manage the mental and physical health of the staff. Achieve the final objective of the project, maximize team performance, improve interaction between team members, resolve issues, encourage communication, and manage project teams, in order to achieve the objectives.</p>	<ul style="list-style-type: none"> • Project team development • Various organizational operation skills used in project work • Staff development such as education and training • Fundamentals of healthcare • Fundamentals of labor management, such as the Labor Standards Act 	<ul style="list-style-type: none"> • Evaluating the abilities of staff and teams to achieve goals • Leading project teams and staff toward goals • Identifying skill deficiencies • Planning a productivity improvement measure • Improving an organization's sense of stagnation • Continuously motivating the staff • Conducting important decision-making meetings for a project • Revitalizing communication between project teams and staff • Enforcing compliance to standards and regulations of the organization

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	3-9 Supplier selection and procurement management	<p>When procuring system development staff, products, and services from external organizations, select a supplier which is best suited to the project conditions.</p> <p>Negotiate the contract with the supplier with an intention to suppress mutual risks.</p> <p>Manage the project work process so that the procured staff can harmonize with the internal teams to exert their expected abilities. Also, receive regular progress reports, evaluate if quality and productivity are compliant with procurement specifications, and take appropriate actions if necessary.</p> <p>In the case of nonfulfillment of the contract by the supplier, both parties should consult on the matter to resolve the problem as soon as possible. If the contract is changed, clarify the details of the change and modify the contract.</p>	<ul style="list-style-type: none"> • System development business and contracts • Suppliers such as system development corporate or service provider corporate • System development staff • Products • Service utilization • System development requirements • SLA • RFP (Request For Proposal) • Procurement specifications • An organization's standards for selecting suppliers • Fundamentals of deal negotiation • Fundamentals of legal restrictions • Fundamentals of confidentiality • Fundamentals of intellectual property rights • Fundamentals of overseas procurement • Documentation 	<ul style="list-style-type: none"> • Evaluating the suitability and quality of the items procured from suppliers • Creating an appropriate RFP • Evaluating suppliers in accordance with the criteria and selecting the most appropriate supplier • Evaluating if procured goods comply with the procurement specifications • Estimating the impact of delays in procurement activity • Analyzing the cause of delays in procurement activity • Pointing out the nonfulfillment of a contract, and promoting recovery • Creating a procurement change plan • Negotiating a procurement change contract
	3-10 Cost control	<p>Analyze the costs spent during a certain period comprehensively through comparison with the cost baseline, and also analyze the costs in detail for each activity. Forecast the planned cost at completion on the basis of actual cost, the progress of scheduled activities, the forecasted completion date of the activities, and scope changes.</p> <p>If a large deviation from the cost baseline is projected, understand the problem, consult the senior manager or stakeholders, and change the cost plan by using contingency costs as necessary.</p>	<ul style="list-style-type: none"> • Actual cost data • Analysis of the variance between the cost plan and actual costs • Forecast of activity completion • Impact of scope change on the cost • Forecast of total cost at project completion • Management of a reserve fund • Cost management support software 	<ul style="list-style-type: none"> • Analyzing a difference between a planned cost and an actual cost • Estimating the impact of cost overrun • Analyzing the causes of cost overrun • Logically explaining the cause of cost overrun to the stakeholders • Creating an alternative plan including countermeasures against cost overrun and using reserve funds • Promoting decision-making by the stakeholders and the senior manager regarding the use of reserve funds • Rationally explaining the need to change the cost plan to the stakeholders

Major category	Minor category	Outline	Required knowledge	Required skills
	3-11 Implementation of quality assurance and quality control	<p>To meet quality requirements, execute quality plan such as review of the deliverables. Evaluate implementation status of the quality assurance and achievement status of quality requirements by the deliverables during a certain period.</p> <p>If the objectives have not been implemented nor achieved, prepare measures for defect removal, and make efforts to improve the quality.</p> <p>If the quality assurance procedure needs to be improved, take corrective measures based on a quality plan change procedure. If necessary, correct the configuration management by using similar procedures.</p>	<ul style="list-style-type: none"> • Organization's quality policy • Quality management methodologies • Quality assurance implementation in each development process • Reviews and tests for the deliverables • Defect removal cost • Quality evaluation metrics • Configuration management 	<ul style="list-style-type: none"> • Understanding the quality requirements for the project • Evaluating the effectiveness of the quality evaluation metrics • Estimating the impact that partial poor quality can have on project quality • Analyzing the cause of poor quality • Logically explaining the cause of poor quality to the stakeholders • Changing the quality plan • Rationally explaining the need to change the quality plan to the stakeholders
	3-12 Risk response and control	<p>Treat risks by injecting resources and activities into the budget and schedule. Risk response includes risk avoidance, risk reduction, risk transfer, risk acceptance or the development of contingency plans to be used if the risk occurs.</p> <p>Monitor and control the implementation status of the response to risks and signs of possible risk occurrence during a certain period. Reevaluate the sufficiency of the risk identification and evaluation, basic policy toward risk occurrence, and risk response plan together with the project progress, and change them as necessary to suit actual conditions.</p> <p>When reporting the project status, handle the risk management plan and its implementation status as important information.</p>	<ul style="list-style-type: none"> • Impact of the exposure of risks on the project • Risk treatment (avoidance, reduction, transfer, acceptance) • Creation of risk response plan • Qualitative risk analysis techniques • Quantitative risk analysis techniques • Risk identification and evaluation • Risk prevention measures • Information security • Contingency plan • Documentation 	<ul style="list-style-type: none"> • Detecting the exposure of risks • Ascertaining that the risk response is not sufficient, and preparing additional measures • Identifying the root cause of a manifested risk, and preventing its reoccurrence • Evaluating the results of implementing the risk prevention measure • Selecting appropriate response to risk • Directing the exercising of the contingency plan • Evaluating the results of implementing the contingency plan
4 Change control	4-1 Understanding change requests	<p>Check the details of a filed change request, and record it on change register.</p> <p>The change request should include an overview of the change, reason for the change request, impact due to the change, and impact of not implementing the change.</p>	<ul style="list-style-type: none"> • Change request • Change request procedure • Change register 	<ul style="list-style-type: none"> • Judging the validity of the change request description format • Analyzing and evaluating change requests, and judging the validity of change requests • Confirming the sufficiency of information quantity which is the basis for the change request

Major category	Minor category	Outline	Required knowledge	Required skills
	4-2 Analysis and evaluation of change requests	After consulting the stakeholders over the details of the change request according to the predefined change management procedure, evaluate them in terms of benefit, scope, time, cost, quality and risk, and then obtain approval of the senior manager as to whether the request should be accepted, rejected, or deferred.	<ul style="list-style-type: none"> • Change request • Information on stakeholders such as persons with experience or engineers related to the change request • Change management procedure • Evaluation of impacts with and without changes • Impacts of changes on project work 	<ul style="list-style-type: none"> • Appropriately evaluating the contents of the change request • Collecting detailed information to judge the importance of the change request • Making use of past change management information • Evaluating each impact of whether or not implementing the change • Considering the balance between the benefits and risks from the change • Explaining to the senior manager, a change request for which a judgment cannot be made.
	4-3 Change approval	Report the judgment of the change request to the stakeholders, and obtain their approval. If it is approved, change the related plans as necessary	<ul style="list-style-type: none"> • Change request • Impacts of change requests 	<ul style="list-style-type: none"> • Rationally explaining the necessity of the change, impact on project execution and control, and risks to the stakeholders • Understanding conflicting opinions
	4-4 Implementing the change	When the change request is approved, the project manager should instruct all members involved in the change to implement the change. In addition, the project manager should check and evaluate the results of implementing the change.	<ul style="list-style-type: none"> • Change request • Evaluation of the results of change implementation • Configuration management • Configuration management support software 	<ul style="list-style-type: none"> • Explaining the impacts and responses accompanying the change • Analyzing and evaluating the progress and results of implementing the change
5 Closure of project	5-1 Closure of project	<p>Verify the functions, performance, and quality of all the final deliverables including the receiving inspection of items procured from suppliers to confirm achievement of the completion criteria of project processes and activities.</p> <p>At the closure of the project, confirm that all problems, except those judged not to affect project closure, have been solved and the handling of all approved change requests has been completed.</p>	<ul style="list-style-type: none"> • Organization's project completion criteria • Project closure confirmation procedure • Organization's deliverables storage standards • Termination of a procurement contract with a supplier 	<ul style="list-style-type: none"> • Evaluating the achievement status of the project purpose and goal • Verifying the deliverables completion status • Determining the validity of completion reports from each team of the project • Directing the completion of unfinished portions • Judging the validity of unresolved problems

Major category	Minor category	Outline	Required knowledge	Required skills
	5-2 Preparation of a project completion report	Document the situation at project completion with respect to the following: the achievement status of the project purpose and goal; the functions, performance, and quality of final deliverables; variance between the project plan and actual results; handling of problems and change requests; project work process; and the status of compliance with the contract. Be sure to record all remaining problems in the project completion report so that they can be taken over.	<ul style="list-style-type: none"> • Organization's project closure report criteria • Organization's project performance criteria • Compliance with the contract • Documentation 	<ul style="list-style-type: none"> • Summarizing the entire project • Identifying important matters in the project work process, and evaluating the project work history • Appropriately evaluating project on the basis of the project completion evaluation indexes • Analyzing the success or failure factors of the project • Identifying points of improvement concerning the project, and making an improvement plan • Proposing how to deal with the remaining issues
	5-3 Receiving inspection of the deliverables by the stakeholders	Hand over all the deliverables related to the project to the stakeholders, and offer appropriate support to them in conducting the receiving inspection as necessary.	<ul style="list-style-type: none"> • Handover of deliverables • Receiving inspection conditions for deliverables 	<ul style="list-style-type: none"> • Explaining the deliverables to the person in charge of the receiving inspection • Appropriately answering inquiries from the person in charge of the receiving inspection
	5-4 Project completion report and termination	Report project completion status to project teams, the senior manager, stakeholders, and the plan approval organization. Conclude all project activities with approval by the stakeholders and the plan approval organization, and release all project staff and resources.	<ul style="list-style-type: none"> • Contents of the project completion report • Fundamentals of presentation • Shared information to promote the project • Documentation 	<ul style="list-style-type: none"> • Appropriately documenting important matters of the project work process and completion status • Concisely explaining all important matters concerning the project work process and completion status • Appropriately answering questions from the stakeholders • Identifying information useful for future project work

Major category	Minor category	Outline	Required knowledge	Required skills
6 Project Evaluation	6-1 Evaluation after project completion	<p>Analyze variance between the project plan and actual results, by compiling what results have been achieved on the basis of the post-completion evaluation indexes defined at the time of project planning (concerning the project plan, project work, deliverables, achievements of the project teams and staff, etc.).</p> <p>During evaluation, make use of data and documented information that have been recorded as the project progressed. Also refer to the answers by the stakeholders in the questionnaire created based on the evaluation indexes, etc. and to information on other projects in the past, as required.</p>	<ul style="list-style-type: none"> • Project post-completion evaluation indexes • Project evaluation techniques and applicable techniques • Information on the post-project completion evaluations in the past • Project survey results published by an external organization 	<ul style="list-style-type: none"> • Collecting information useful for post-completion project evaluation • Evaluating the quality level achieved at project completion • Obtaining appropriate evaluation information from the stakeholders and the senior manager by creating questionnaires • Evaluating the project objectively by using survey results published by an external organization
	6-2 Collecting lessons learned	<p>Organize performance data collected during the course of project implementation and work with regard to committed person-hours, allocated quantity of resource, work period, quality, costs, risks, scope change, and various problems. Then, classify and calculate the data by activities, phases, and project teams. Based on this data, analyze the variance between the plan and the actual performance.</p> <p>Compile databases of the analysis results including project evaluation results, and make use of them as standard values, reference information for failure recovery operations, and lessons learned for future projects.</p> <p>Evaluate whether or not the obtained data and evaluation criteria defined by the organization are effective in various aspects such as decision-making by contrasting them with actual conditions, and change them as necessary.</p>	<ul style="list-style-type: none"> • Organization of data • Fundamentals of statistical analysis of data • Compilation of a database of the project performance 	<ul style="list-style-type: none"> • Identifying important information useful for project management • Comparing and analyzing past project data and the current project data • Organizing data for a certain purpose • Proposing revision of organization's evaluation criteria • Identifying effective information obtained in the project, and compiling it so that it can be shared.

**■ Project Manager Examination (Level 4)
Syllabus (Version 4.1)**

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