

Information Technology Engineers Examination Registered Information Security Specialist Examination

Outline

Ver 3.0

This will be applied from the examination in spring 2017

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

INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

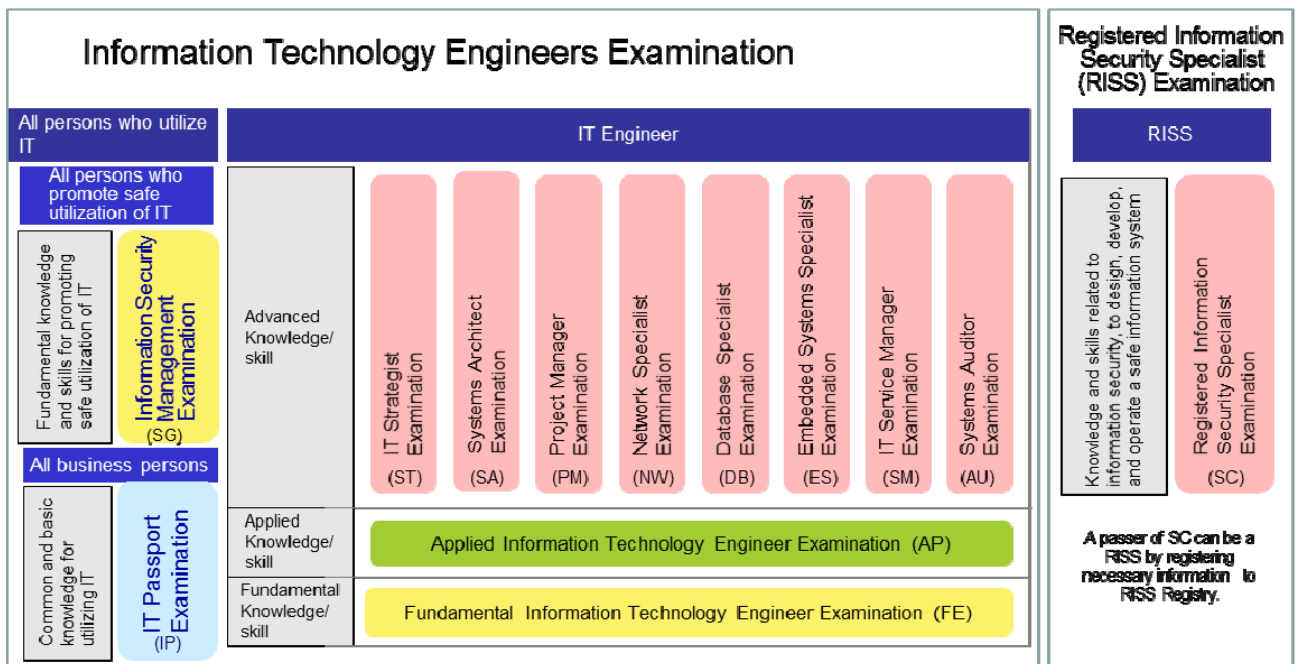
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1. Examination categories

As shown below, the Information Technology Engineers Examination and registered Information Security Specialist Examination are conducted. The Information Technology Engineers Examination consists of the “IT Passport Examination”, the “Information Security Management Examination”, the “Fundamental Information Technology Information Engineer Examination”, the “Applied Information Technology Engineer Examination”, and the Advanced Examinations (the “IT Strategist Examination”, the “Systems Architect Examination”, the “Project Manager Examination”, the “Network Specialist Examination”, the “Database Specialist Examination”, the “Embedded Systems Specialist Examination”, the “IT service Manager Examination”, and the “Systems Auditor Examination”).



2. Typical examinees

The typical examinees, tasks and roles, the expected technology level, and the corresponding levels for each examination category are shown below.

(1) Information Technology Passport Examination [IP]

Typical examinees	Individuals who have basic knowledge of information technology that all business workers should commonly possess, and who are doing information technology related tasks, or trying to utilize information technology in their tasks in charge.
Tasks and Roles	Individuals who have acquired common basic knowledge of information technology that a business worker should possess, and utilize information technology in their tasks as well as perform the following activities: a) Understand information devices and systems to use, and utilize them. b) Understand the tasks in charge, identify problems of those tasks, and act to provide required solutions. c) Perform acquisition and utilization of information safely. d) Support task analysis and systemization activities under the guidance of superiors.
Expected Technology Level	The following basic knowledge is required as a business worker in order to determine information devices and systems, and to perform his/her tasks in charge as well as facilitate systemization. a) Knowledge of computer systems and networks to determine the information devices and systems to use, and knowledge of how to utilize office tools. b) Knowledge of corporate activity and related tasks in order to understand the tasks in charge. Also, in order to identify issues of the tasks in charge and provide required solutions, systematic thinking and logical thinking as well as knowledge of problem analysis and problem solving methodologies are required. c) Ability to act in accordance with relevant laws and regulations as well as various information security provisions in order to utilize information safely. d) Knowledge of development and operations of information systems in order to support analysis and systemization of tasks.
Corresponding Level	Corresponds with Level 1 of the Common Career/Skill Framework for the 5 Human Resource Models (Strategist, Systems Architect, Service Manager, Project Manager, and Technical Specialist)

(2) Information Security Management Examination [SG]

Typical Examinees	Individuals working as information security leaders in a department that uses information systems, who understand the purpose and details of information security measures required for performing operations of the department and information security regulations set forth by the organization (internal regulations of the organization, including information security policy), and who ensure, maintain, and improve information security for safe use of information and information systems.
Tasks and Roles	Individuals perform the following tasks and roles for ensuring, maintaining, and improving information security in the department that uses information systems: a) Performing operations required for maintaining information security of information assets in the department. b) Identifying information assets of the department, conducting information security assessment, and summarizing measures against risks. c) Clarifying information security measures related to information assets of the department and requirements for continuation of information security. d) For procuring information systems, clarifying information security requirements necessary to the department that uses the information systems. Also, for outsourcing business operations, clarifying the requirements of information security measures in the contract and verifying the status of their implementation.

	<p>e) Ensuring information security in the department.</p> <p>f) Preventing information security incidents such as internal fraud by raising information security awareness and compliance of other members in the department.</p> <p>g) In the event of occurrence or likelihood of occurrence of an information security incident, taking appropriate measures based on information security regulations, laws and ordinances, guidelines, standards, etc.</p> <p>h) Proposing opinions and issues to the relevant divisions concerning information security in the department or the overall organization.</p>
Expected Technology Level	<p>The following knowledge and practical skills are required in order to ensure, maintain, and improve information security in the department that uses information systems;</p> <p>a) Capability to independently execute a part of information security management for the department.</p> <p>b) Capability to appropriately deal with an information security incident as information security leaders in the event of occurrence or likelihood of occurrence of an incident.</p> <p>c) Capability to understand basic terms and contents related to overall information technology.</p> <p>d) Capabilities to collect case examples and trends from information security organizations and other companies and to evaluate the necessity of applying them to the department's environment, with basic knowledge of information security technology and information security regulations.</p>
Corresponding Level	Corresponds with Level 2 of Common Career/Skill Framework

(3) Fundamental Information Technology Engineer Examination [FE]

Typical examinees	Individuals who have basic fundamental knowledge and skills required to be an advanced IT human resource, and who possess practical utilization abilities.
Tasks and Roles	<p>Individuals engaged in the planning of basic strategy or in the implementation of IT solutions, products or services, and who perform either of the following activities under the guidance of superiors.</p> <ol style="list-style-type: none"> 1. Participate in strategic planning that utilizes information technology in response to issues that a consumer (company management, social system) faces. 2. Build a highly reliable and productive system through design and development of systems, or through optimally combining (integrating) generic products. Also, contribute to the realization of stable operational services of systems.
Expected Technology Level	<ol style="list-style-type: none"> 1. With regard to strategic planning utilizing information technology, the following knowledge and skills are required, depending on the tasks in charge. <ol style="list-style-type: none"> a) Understanding of the basics of target business fields and tasks and capability to utilize this understanding in his/her tasks in charge. b) Capability to perform projection, analysis and evaluation of information strategies under the guidance of superiors. c) Capability to participate in making proposals under the guidance of superiors. 2. With regard to design, development and operation of systems, the following knowledge and skills are required depending on the tasks in charge. <ol style="list-style-type: none"> a) Understanding of the basics of information technology in general and capability to utilize this understanding in his/her tasks in charge. b) Capability to design, develop and operate systems under the guidance of superiors. c) Capability to design software under the guidance of superiors. d) Understanding of policies of superiors and ability to develop software on his/her own.
Corresponding Level	Corresponds with Level 2 of the Common Career/Skill Framework for the 5 Human Resource Models (Strategist, Systems Architect, Service Manager, Project Manager, and Technical Specialist)

(4) Applied Information Technology Engineer Examination [AP]

Typical Examinees	Individuals who have applied knowledge and skills required to be an advanced IT human resource, and who have established their own direction as an advanced IT human resource.
Tasks and Roles	Individuals engaged in the planning of basic strategy or the implementation of IT solutions, products or services, and who perform either of the following activities independently. <ol style="list-style-type: none"> 1. Devise strategy that utilizes information technology in response to issues that a consumer (company management, social system) faces. 2. Construct a highly reliable, productive system through the design and development of systems, or through optimally combining (integrating) generic products. Also realize stable operational services of systems.
Expected Technology Level	<ol style="list-style-type: none"> 1. With regard to strategic planning that utilizes information technology, the following knowledge and skills are required, depending on the tasks in charge. <ol style="list-style-type: none"> a) Capability to understand the managements' policies, accurately grasp the external environment surrounding the management, and collect trend information and case studies when formulating business and IT strategies. b) Capability to conduct gap analysis, etc. based on predetermined monitoring indicators when evaluating management and IT strategies. c) Capability to participate in discussing proposals and making parts of proposal documents. 2. With regard to system design, development and operation, the following knowledge and skills are required depending on the tasks in charge. <ol style="list-style-type: none"> a) Capability to organize system requirements and conduct surveys of applicable technologies when designing architectures. b) Capability to ensure stable operation and provision of services in the field concerned as a member of teams such as administration, operation, and service desk teams. c) Capability to manage scope, budget, process, quality, etc. as a project member under a project manager (leader). d) Capability to understand the policies of superiors and solve technical problems spontaneously with regard to the design, development, operation, and maintenance of information systems, networks, databases, embedded systems, etc.
Corresponding Level	Corresponds with Level 3 of the Common Career/Skill Framework for the 5 Human Resource Models (Strategist, Systems Architect, Service Manager, Project Manager, and Technical Specialist)

(5) Information Technology Strategist Examination [ST]

Typical Examinees	Individuals who have an established field of expertise as an advanced IT human resource, and who plan, propose, and promote basic strategies to innovate, sophisticate, and optimize certain processes with regard to business models and activities utilizing information technology, based on the company's management strategies. Or, individuals who supervise the planning and development of embedded systems, and plan, propose, and promote basic strategies to realize new values.
Tasks and Roles	Individuals engaged in the planning, promotion, or support of business innovation, operational process innovation, development of innovative products and services utilizing information technology, and who take a leading role in the following while guiding subordinates. <ol style="list-style-type: none"> a) In accordance with the characteristics of businesses in different industry fields, formulate business strategies utilizing information technology in order to realize management strategies, and evaluate implementation results. b) In accordance with the characteristics of the businesses in different industry fields, formulate information system strategies and overall systemization plans for realizing business strategies, and evaluate implementation results. c) Formulate concepts and plans for individual systemization to realize information system

	<p>strategies, and evaluate implementation results.</p> <p>d) Considering the prerequisites and constraints of each business, manage the execution of reform programs comprising multiple individual projects in order to realize information system strategies.</p> <p>e) As well as formulating development strategies for embedded systems, supervise the lifecycle covering development, construction, maintenance, etc.</p>
Expected Technology Level	<p>The following knowledge and practical ability are required to execute the formulation, proposal, and promotion of basic strategies utilizing information technology in sections such as business planning, the promotion of operational process innovation, computerization planning, and product and service planning.</p> <p>a) Capability to advise on the analysis of the business environment, the analysis of information technology trends, and the formulation of business models as well as capability to formulate or support business strategies. Also, capability to evaluate the achievement level of the business strategies and provide feedback to management.</p> <p>b) Capability to conduct surveys and analysis of the target business and task environment, and formulate information system strategies and overall systemization plans. Also, capability to evaluate information system strategies and overall systemization plans.</p> <p>c) Capability to conduct survey and analysis of the target business and task environment, formulate concepts and plans for systemization of individual systems based on overall systemization plans, and procure appropriate individual systems. Also, capability to evaluate the implementation results of the systemization concepts and plans.</p> <p>d) Capability to understand the prerequisites for implementing information system strategies and reform programs, and monitor and control the realization of information system strategies. Also, capability to perform causal analysis, formulate and implement countermeasures, etc. with regard to the risks in the realization of information system strategies.</p> <p>e) With regard to the development of new embedded systems, capability to plan competitive systems based on analysis of related technology trends, social constraints and needs, intellectual property, etc. Also, capability to formulate and promote deployment strategies and development strategies in accordance with added values, extensibility, flexibility, etc.</p>
Corresponding Level	Prerequisite for Level 4 of the Common Career/Skill Framework Human Resource Model of a Strategist

(6) Systems Architect Examination [SA]

Typical Examinees	Individuals who have an established field of expertise as an advanced IT human resource, and in response to suggestions from IT strategists, define the requirements that are necessary for the development of information systems or embedded systems, design the architecture to realize the systems, and for information systems, lead development.
Tasks and Roles	<p>[Information Systems]</p> <p>Individuals engaged in the structure design of information systems for the realization of information system strategies, the requirements definition needed for development, the design of system methods and the development of information systems, and who take a leading role in the following while guiding subordinates.</p> <p>a) Design the structure of the target information system from the perspective of overall optimization in order to realize information system strategies.</p> <p>b) Analyze, organize and document the requirements needed for the development of target information systems, in order to realize overall systemization plans and the individual systemization concepts and plans.</p> <p>c) Design optimal system methods for realizing the requirements of target information systems.</p> <p>d) Based on the requirements and the designed system methods, conduct review of the design, development, testing, operation, and maintenance of software that satisfy the required quality,</p>

	<p>and develop the target information systems. However, for specific technologies such as databases, networks, etc, accept support from specialists when necessary.</p> <p>e) Evaluate target information systems and the effectiveness thereof.</p> <p>[Embedded Systems] Individuals engaged in the survey and analysis of embedded system requirements, deciding functional specifications, and documenting the required specifications for hardware and software, and who take a leading role in the following while guiding subordinates.</p> <p>a) Based on the conceptions and development plans for embedded systems, survey and analyze the functional requirements, technical requirements, environmental prerequisites, and quality requirements and determine the functional specifications of target embedded systems.</p> <p>b) Consider the assignment of functions to hardware and software to realize functional specifications, design optimal system architecture, and compile the required specifications for hardware and software.</p> <p>c) Formulate policies regarding the validity of introducing generic modules and the possibilities of reusing software assets that have already been developed.</p>
Expected Technology Level	<p>The following knowledge and practical skills are required to smoothly execute the tasks and roles of Systems Architect.</p> <p>[Information Systems]</p> <p>a) Capability to correctly understand information system strategies and consider the overall organization of task models and information systems.</p> <p>b) Capability to utilize both specialist knowledge of all types of task processes and knowledge of systems, and to propose appropriate systems.</p> <p>c) Capability to make abstractions (models) of a company's business activities and reconstruct them into a form in which information technology can be applied.</p> <p>d) Knowledge about best practices for each industry, the status of task processes in major companies, and the task processes in many user companies of the same industry, specialist knowledge of each different industry, knowledge of industry specific practices, etc.</p> <p>e) Knowledge related to generic systems such as information system implementation methods, development methods, and software packages, and capability to select and apply them appropriately.</p> <p>f) Knowledge about basic elemental technologies with regard to operating systems, databases, networks, etc. and capability to construct and maintain appropriate information systems, considering the technological risks and effects of those technologies.</p> <p>g) Capability to establish appropriate evaluation criteria for the system operation, task operation, investment effects and task effects of information systems, and analyze and evaluate the systems.</p> <p>h) Capability to consider generalization of software and system services, bearing in mind the possibility of deployment to many companies.</p> <p>[Embedded Systems]</p> <p>a) Capability to examine environmental conditions and quality requirements such as safety of where the target embedded systems are used, and determine the functional specifications that should be realized.</p> <p>b) Capability to design appropriate combinations of hardware and software based on the functional specifications of target embedded systems and compile the designs as separate requirement specifications.</p> <p>c) Thorough knowledge about real time operating systems and knowledge of generic modules, and capability to consider the possibility of reusing software assets and utilizing them appropriately.</p>

Corresponding Level	Prerequisite for Level 4 of the Common Career/Skill Framework Human Resource Models of Systems Architects and Technical Specialists
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(7) Project Manager Examination [PM]

Typical Examinees	Individuals who have an established field of expertise as an advanced IT human resource, and who, as a person responsible for a system development project, prepare project plans, secure the required personnel and resources, and control and manage the project while taking responsibility for achievement of the planned budget, delivery date, and quality.
Tasks and Roles	Individuals engaged in the planning, execution and management of system development projects as the person in charge of the project, and who take a leading role in the following while guiding subordinates. <ul style="list-style-type: none"> a) Support the formulation of individual systemization concepts and plans as required, and prepare project plans for the execution of the relevant projects based on the individual systemization concepts and plans that were formulated. b) Secure necessary personnel and resources, and establish project organizations. c) Manage budget, process, quality, etc. and run the project smoothly. Keep track of the state of progress, pick up and recognize problems and anticipated future issues at an early stage, and implement appropriate measures and actions to achieve project goals. d) Report appropriately to senior members and stakeholders on the project execution plans, state of progress, issues, countermeasures, etc, and obtain support and cooperation to run the project smoothly. e) Analyze and evaluate the project plans and achievements at the end of each stage and at the end of projects, or as needed and reflect these in subsequent operations of the projects as well as provide them as reference models for other projects.
Expected Technology Level	The following knowledge and practical skills are required to smoothly execute the tasks and roles of Project Manager. <ul style="list-style-type: none"> a) Understanding of the basics regarding organization management and IT systems. b) Capability to correctly understand the expectations towards the individual systemization concepts and plans as well as the projects, and prepare feasible project plans. c) Capability to reliably accomplish project goals under the prerequisites and constraints. d) Capability to manage personnel, resources, budget, process, quality, etc, unify overall understanding of the project, and run the project. e) Capability to understand the state of progress of the project and anticipated risks at an early stage, and deal with them appropriately. f) Capability to appropriately analyze and evaluate project plans and achievements. Also, capability to utilize the results in the subsequent operation of the projects as well as provide them as reference for other projects.
Corresponding Level	Prerequisite for Level 4 of the Common Career/Skill Framework Human Resource Model of a Project Manager

(8) Network Specialist Examination [NW]

Typical Examinees	Individuals who have an established field of expertise as an advanced IT human resource, and who utilize specific technologies related to networks and take a central role in the planning, requirements definition, development, operation, and maintenance of optimal information system infrastructures while providing technical support for the planning, requirements definition, development, operation, and maintenance of information systems as a specialist of specific technologies.
Tasks and Roles	Individuals engaged in planning, requirements definition, development, operation, and maintenance work for network systems, and who take a leading role in the following while guiding subordinates. <ul style="list-style-type: none"> a) As network administrator, manage network resources which comprise the foundation of

	<p>information systems.</p> <p>b) Analyze requirements of the network systems and perform the planning, requirements definition, development, operation, and maintenance considering efficiency, reliability, and safety.</p> <p>c) Provide network related technical support for the planning, requirements definition, development, operation, and maintenance of information systems.</p>
Expected Technology Level	<p>The following knowledge and practical skills are required in order to construct and maintain network systems that conform to objectives.</p> <p>a) Capability to foresee the trend of network technologies and services, and select applicable technologies and services according to objectives.</p> <p>b) Capability to understand precisely the requirements of the company, organization or individual applications, and create requirement specifications of network systems.</p> <p>c) Capability to evaluate design techniques such as modeling, protocol technology, reliability design, security technology, network services, and costs etc. that relate to the requirements specifications, and create optimal logical designs and physical designs.</p> <p>d) Capability to utilize network related companies (telecommunications companies, vendors, construction firms, etc.), and construct and operate network systems.</p>
Corresponding Level	Prerequisite for Level 4 of the Common Career/Skill Framework Human Resource Model of a Technical Specialist

(9) Database Specialist Examination [DB]

Typical Examinees	Individuals who have an established field of expertise as an advanced IT human resource, and who utilize specific technologies related to databases and take a central role in the planning, requirements definition, development, operation, and maintenance of optimal information system infrastructures while providing technical support for the planning, requirements definition, development, operation, and maintenance of information systems as a specialist of specific technologies.
Tasks and Roles	<p>Individuals engaged in the planning, requirements definition, development, operation, and maintenance work for data resources and databases, and who take a leading role in the following while guiding subordinates.</p> <p>a) As data administrator, manage data resources for the entire information system.</p> <p>b) Analyze requirements of the database systems and perform planning, requirements definition, development, operation, and maintenance considering efficiency, reliability, and safety.</p> <p>c) Provide database related technical support for the planning, requirements definition, development, operation, and maintenance of individual system development.</p>
Expected Technology Level	<p>The following knowledge and practical skills are required for the planning, requirements definition, development, operation, and maintenance of high quality databases.</p> <p>a) Capability to foresee the trend of database technologies, and select applicable technologies according to objectives.</p> <p>b) Capability to understand the purposes and techniques of data resource management, and perform standardization of data parts as well as conduct the planning, requirements definition, development, operation, and maintenance of repository systems.</p> <p>c) Capability to understand data modeling techniques, conduct data analysis based on user requirements, and create accurate conceptual data models.</p> <p>d) Capability to understand the characteristics of database management systems, and conduct planning, requirements definition, development, operation, and maintenance of high quality databases.</p>
Corresponding Level	Prerequisite for Level 4 of the Common Career/Skill Framework Human Resource Model of a Technical Specialist

(10) Embedded Systems Specialist Examination [ES]

Typical Examinees	Individuals who have an established field of expertise as an advanced IT human resource, and who utilize their broad knowledge and skills related to embedded system development and lead the establishment of optimal embedded system development infrastructure and the design, establishment, and production of embedded systems.
Tasks and Roles	Individuals engaged in the development, implementation, and testing in the development process of embedded systems based on hardware and software requirement specifications of the embedded systems, and who take a leading role in the following while guiding subordinates. a) Balance the division of functions based on trade-offs between hardware and software that realize optimal functional specifications and realtime processing in embedded systems, and create design and specification documents. b) Lead the execution of tasks of each stage in the embedded systems development process. c) Based on advanced specialist knowledge and development experiences in specific technology and product fields, obtain technical knowledge from experts in the relevant development fields, and incorporate the knowledge into each stage of the development processes. d) Prepare and improve the development environment for performing development.
Expected Technology Level	The following knowledge and practical skills are required to appropriately decompose the required functions, performance, quality, reliability, security, etc. into hardware and software requirements and realize an optimal embedded system. a) Capability to realize appropriate combinations of hardware and software based on functional specifications and lead the execution of each stage of embedded system development processes. c) Capability to obtain technical knowledge from experts in the relevant development fields and incorporate the knowledge into each stage of the embedded system development processes, based on advanced specialist knowledge and development experiences in specific technology and product fields. c) Capability to construct and improve effective development environments for performing embedded system development.
Corresponding Level	Prerequisite for Level 4 of the Common Career/Skill Framework Human Resource Model of a Technical Specialist

(11) Information Technology Service Manager Examination [SM]

Typical Examinees	Individuals who have an established field of expertise as an advanced IT human resource, and who with regard to the overall information system, ensure stable operations and act to minimize damage from incidents as well as take efforts such as continuous improvement and quality management to provide highly safe and reliable services.
Tasks and Roles	Individuals engaged in the management of IT services with the objective of continually improving their quality and cost efficiency, and who take a leading role in the following while guiding subordinates. a) Prepare and execute the processes of service support and service delivery as a leader of teams such as operation management, operation, and service desk teams, and provides IT services to customers at optimal quality and cost. b) Conduct acceptance, operation, etc. of systems within the lifecycle management of applications. Also provide stable information system infrastructures including development environments, and conduct efficient operation management of systems. c) Conduct continual improvement of IT services and management processes. Report the state of implementation of IT services to customers, as well as make efforts to improve customer satisfaction. d) Conduct the operation and management of information security policies and the controlling of information security incidents, and effectively manage information security during IT service activities.

	e) Conduct installation of hardware that matches customer facility requirements, installation of software, customization, maintenance, and repair. Also, conduct facility management of data centers.
Expected Technology Level	<p>The following knowledge and practical skills are required to smoothly execute the tasks and role of IT Service Manager.</p> <ul style="list-style-type: none"> a) Capability to provide IT services by understanding and implementing the objectives and contents of each of the process in service support and service delivery. b) Capability to implement system operation control, operation methods in case of an incident, performance management, and configuration management. Management techniques required for system operation management such as incident management, configuration management, account management, and performance management, and capability to maintain the quality of information system infrastructures. c) Capability to prepare a plan, implement and evaluate improvement measures for IT services as well as provide high quality service reports to customers. d) Knowledge and techniques required to implement highly effective information security measures, and capability to operate and manage information security. e) Capability to install, set up, maintain, and extend functions, and recover from incidents with the aim of stable operation of hardware and software that has been or is to be installed. Also, knowledge relating to the safety management of data centers and capability to execute facility management.
Corresponding Level	Prerequisite for Level 4 of the Common Career/Skill Framework Human Resource Model for a Service Manager

(12) Systems Auditor Examination [AU]

Typical Examinees	Individuals who have an established field of expertise as an advanced IT human resource, and who from a standpoint independent from auditees, comprehensively inspect and evaluate the risks and controls of information systems and embedded systems, report audit results to top management and others, and recommend improvements.
Tasks and Roles	<p>Individuals engaged in the audit of information systems and embedded systems from a position independent of auditees, and who take a leading role in the following while guiding subordinates.</p> <ul style="list-style-type: none"> a) Analyze the risks involved in information systems and embedded systems based on broad and thorough knowledge of information systems, embedded systems and their planning, development, operation and maintenance, and understand the necessary controls. b) By verifying or evaluating the controls relating to information systems and embedded systems, either provide endorsements or advice, and contribute to the improvement of IT governance and securing of compliance. c) Prepare audit plans to implement b) and perform audits. Also, report audit results to top management and the relevant people, and perform follow-ups.
Expected Technology Level	<p>The following knowledge and practical skills are required to promote enhancements so that information systems and embedded systems are utilized appropriately and safely, and to contribute to the improvement of IT governance and securing of compliance.</p> <ul style="list-style-type: none"> a) Broad and thorough knowledge of information systems, embedded systems and their planning, development, operation and maintenance as well as specialist knowledge related to the risks and controls of realizing those objectives and functions. b) Capability to evaluate the task processes to which the information systems and embedded systems are applied and the risk to the company strategies, as well as capability to clarify issues of the controls in place and establish decision criteria to analyze and evaluate the issues. c) Capability to prepare audit plans in accordance with business requirements, management policies, regulations, guidelines, contracts, and internal rules for information security, and protection of privacy and internal controls, etc. in order to contribute to the improvement of

	<p>IT governance and securing of compliance, etc, as well as appropriately managing audit tasks based on plans.</p> <p>d) Capability to apply auditing techniques in a timely and precise manner in order to implement effective and efficient auditing procedures at the planning, development, and operation stages of information systems and embedded systems.</p> <p>e) Capability to put together audit results as logical reports based on facts, provide valuable and convincing recommendations, and perform follow-ups.</p>
Corresponding Level	Prerequisite for Level 4 of the Common Career/Skill Framework Human Resource Model for a Service Manager

(13) Registered Information Security Specialist Examination [SC]

Typical Examinees	Individuals who support planning, design, development and operation of an information system in a company or an organization, also investigate, analyze, evaluate cybersecurity measures, and give guidance and advice based on the results, while utilizing the professional knowledge and skills related to cybersecurity.
Tasks and Roles	<p>Individuals engaged in promotion or support tasks for the planning, requirements definition, development, operation, and maintenance of security functions, or the preparation of secure information system foundations, and who take a leading role in the following while guiding subordinates.</p> <p>a) Analyze and evaluate threats and vulnerabilities to information systems and promote or support the planning, requirements definition, and development of security functions that appropriately avoid or prevent these.</p> <p>b) Analyze the threats to information systems during development projects of information systems or security functions, and support project management appropriately.</p> <p>c) Support security administration from a technical side in dealing with security violations, application of security patches, and other information system operation processes.</p> <p>d) Support information security management sections such as in the creation of information security policies and the education of users.</p>
Expected Technology Level	<p>As an information security technology specialist, the following knowledge and practical skills are required to apply information security technology in cooperation with other specialists as well as for the planning, requirements definition, development, operation, and maintenance of secure information systems.</p> <p>a) Capability to conduct risk analysis of information systems or information system infrastructures, and extract concrete information security requirements compliant with information security policies.</p> <p>b) For information security measures, basic skills and application skills for multiple specific areas with regard to technological measures, and capability to apply these skills to target systems as well as evaluating their effects.</p> <p>c) For information security measures, basic knowledge and techniques for applicable cases with regard to physical and administrative measures, and capability to understand the basic approaches to information security management, detailed knowledge of cases where the approaches are applicable, and capability to evaluate them.</p> <p>d) For information technology knowledge, basic knowledge of networks, databases, and system development environments, and capability to select necessary elemental technology including encryption, authentication, filtering, and logging in order to ensure confidentiality, accountability, etc. of information systems.</p> <p>e) Basic knowledge as well as knowledge and experience of specific application examples of process management and quality control for information system development.</p> <p>f) Basic knowledge regarding information security policies, and capability to support information security management sections in policy formulation and user education, etc.</p> <p>g) Basic knowledge of information security related legal requirements, etc. and capability to</p>

	apply them.
Corresponding Level	Prerequisite for Level 4 of the Common Career/Skill Framework Human Resource Model of a Technical Specialist

3. Examination Time, Type, and Number of Questions and Answers

Table below shows the time, type, and number of questions and answers for each examination

[Time, Type, and Number of Questions and Answers for Each Examination]

Examination Category	120 mins		
	Exam Type	No. of Qs No. of As	
IT Passport Examination	Multiple-Choice (1 from 4)	100 ^(Note) Short question	100

(Note) Out of the 100 questions, the 92 questions are used for the total evaluation, while the rest 8 questions are used to evaluate the questions to be given in the future. The number of questions for evaluation in each field are as follows: 32 Strategy questions, 18 Management questions and 42 Technology questions.

Examination Category	Morning		Afternoon	
	9:30~11:00 (90 mins)		12:30~14:00 (90 mins)	
	Exam Type	No. of Qs No. of As	Exam Type	No. of Qs No. of As
Information Security Management Examination	Multiple-Choice (1 from 4)	50 50	Multiple-Choice	3 3

Examination Category	Morning		Afternoon	
	9:30~12:00 (150 mins)		13:00~15:30 (150 mins)	
	Exam Type	No. of Qs No. of As	Exam Type	No. of Qs No. of As
Fundamental Information Technology Engineer Examination	Multiple-Choice (1 from 4)	80 80	Multiple-Choice	13 ^(Note) 7
Applied Information Technology Engineer Examination	Multiple-Choice (1 from 4)	80 80	Short Answer	11 ^(Note) 5

(Note) For details of questions in each field of the Afternoon Examination in the Fundamental Information Technology Engineer Examination and Applied Information Technology Engineer Examination, see [Annex](#).

Examination Category		Morning I		Morning II		Afternoon I		Afternoon II		
		9:30~10:20 (50 mins)		10:50~11:30 (40 mins)		12:30~14:00 (90 mins)		14:30~16:30 (120 mins)		
		Exam Type	No. of Qs No. of As	Exam Type	No. of Qs No. of As	Exam Type	No. of Qs No. of As	Exam Type	No. of Qs No. of As	
Advanced Examinations	Information Technology Strategist Examination	Multiple-Choice (1 from 4)	30 30	Multiple-Choice (1 from 4)	25 25	Short Answer	4 2	Essay	3 1	
	Systems Architect Examination			Multiple-Choice (1 from 4)	25 25	Short Answer	4 2	Essay	3 1	
	Project Manager Examination			Multiple-Choice (1 from 4)	25 25	Short Answer	3 2	Essay	2 1	
	Network Specialist Examination			Multiple-Choice (1 from 4)	25 25	Short Answer	3 2	Short Answer	2 1	
	Database Specialist Examination			Multiple-Choice (1 from 4)	25 25	Short Answer	3 2	Short Answer	2 1	
	Embedded Systems Specialist Examination			Common Questions	Multiple-Choice (1 from 4)	25 25	Short Answer	3 2	Short Answer	2 1
	Information Technology Service Manager Exam				Multiple-Choice (1 from 4)	25 25	Short Answer	3 2	Essay	2 1
	Systems Auditor Examination	Multiple-Choice (1 from 4)	25 25		Short Answer	3 2	Essay	2 1		
Registered Information Security Specialist Exam			Multiple-Choice (1 from 4)	25 25	Short Answer	3 2	Short Answer	2 1		

4. Grading Method, Points Allocation and Pass Criteria

- a) As the grading method, IRT (Item Response Theory) is used for IT Passport Exam, and raw points are used for the other examination categories and for all time slots.
- b) The pass criteria for each examination are as follows:
- In the IT Passport Examination, if the total evaluation points (total for all fields) and the evaluation points in each field (points for the 3 fields of Strategy, Management, and Technology) are all above the required standard then a pass is awarded.
 - In the Information Security Management Examination, Fundamental Information Technology Engineer Examination, Applied Information Technology Engineer Examination, Advanced Examinations and Registered Information Security Specialist Examination (hereinafter called “RISS Examination”) a pass is awarded if points in each of the time slots (Morning, Afternoon, Morning I, Morning II, Afternoon I, and Afternoon II Examinations in the table below) are all over the required standard.
- c) The points allocation (100%) and pass points are shown in the table below.
- d) When differences of difficulties are found among the questions in the exam results, pass points may be changed in the other Examinations than IT Passport Examination.

[Points Allocation and Pass Points for Each Examination Category]

Examination	Time Slot	Point	Pass Points		
IT Passport Examination	—	1,000 total points	Total evaluation points (of all fields): 600 points / 1000 total points Evaluation points in each field: Strategy 300 points / 1,000 total points Management 300 points / 1,000 total points Technology 300 points / 1,000 total points		
Examination Category		Time Slot	Total Point	Pass Points	
Information Security Management Examination		Morning	100	60	
		Afternoon	100	60	
Fundamental Information Technology Engineers Examination Applied Information Technology Engineers Examination		Morning	100	60	
		Afternoon	100	60	
Advanced Examinations	IT Strategist Examination		Morning I	100	60
	Systems Architect Examination		Morning II	100	60
	Project Manager Examination		Afternoon I	100	60
	IT Service Manager Examination		Afternoon II	—	Rank A ^(Note)
	Systems Auditor Examination		Morning I	100	60
	Network Specialist Examination		Morning II	100	60
	Database Specialist Examination		Afternoon I	100	60
	Embedded Systems Specialist Examination		Afternoon II	100	60
	Registered Information Security Specialist Examination		Morning I	100	60
			Morning II	100	60
Afternoon I			100	60	
Afternoon II			100	60	

(Note) Evaluation Method for the Afternoon II Examination (essay type)

- The content of the essay is evaluated from evaluation view points such as sufficiency of the points required by the question, specificity of the essay, validity of content, consistency of logic, assertions based on insights, perceptiveness/ability to take action, originality/far-sightedness, and presentation and composition ability. Also, if the essay content does not adhere to the “Instructions for Answering” in the questions booklet, evaluation may be lowered depending on the extent of deviation, despite the content of the essay.
- The relationship between the evaluation ranks and pass & fail are shown in the table below.

[Evaluation Ranks and Pass/Fail Relationship of Afternoon II Examination (Essay Type)]

Evaluation Rank	Content	Pass/Fail
A	Satisfies passing level	Pass
B	Falls just short of passing level	Fail
C	Content is insufficient	
D	Deviates significantly from the requirements of the question	

e) Distribution of points for each question of each examination category is shown in the table below.

[Distribution of points for each question by examination category]

Examination category	Question number	No. of As	Point distribution	Exam type
IT Passport Examination	1~100	100	by IRT (Note 1)	Short question

Examination category	Morning			Afternoon		
	Question number	No. of As	Point distribution	Question number	No. of As	Point distribution
Information Security Management Examination	1~50	50	2 points each	1~3	3	34 points each (Note 2)

Examination category	Morning			Afternoon		
	Question number	No. of As	Point distribution	Question number	No. of As	Point distribution
Fundamental Information Technology Engineers Examination	1~80	80	1.25 points each	1	1	12 points
				2~7	4	12 points each
				8	1	20 points
				9~13	1	20 points

Examination category	Morning			Afternoon		
	Question number	No. of As	Point distribution	Question number	No. of As	Point distribution
Applied Information Technology Engineers Examination	1~80	80	1.25 points each	1	1	20 points
				2~11	4	20 points each

Examination category	Morning I			Morning II			Afternoon I			Afternoon II I		
	Question number	No. of As	Point distribution	Question number	No. of As	Point distribution	Question number	No. of As	Point distribution	Question number	No. of As	Point distribution
Advanced Examinations	Information Technology Strategist Examination Systems Architect Examination]						1~4	2	50 points each	1~3	1	<Based on the evaluation rank> (Note 3)
	Project Manager Examination Information Technology Service Manager Examination Systems Auditor Examination						1~3 2 50 points each			1,2	1	<Based on the evaluation rank> (Note 3)
	Network Specialist Examination Database Specialist Examination			1~25 25 4 points each						1, 2 1 40 points each 2,3 1 60 points each		
	Embedded Systems Specialist Examination											
Registered Information Security Specialist Examination						1~3	2	50 points each				

(Note 1) The evaluation point is calculated from the answer results based on IRT, so no points are allocated.

(Note 2) 100 is the maximum number of point to be scored.

(Note 3) The evaluation is made by the rank, so no points are allocated.

f) The Applied Information Technology Engineer Examination, Advanced Examination, and RISS Examination employ a “Multi-Stage Selection Method” as follows:

<Applied Information Technology Examination>

- If the points in the Morning Examination does not reach the pass level, the Afternoon Examination is not graded and the candidate fails.

<Advanced Examinations Exam Categories, RISS Examination>

- If the point in the Morning I Examination does not reach the pass level, the Morning II, Afternoon I, and Afternoon II Examinations are not graded and the candidate fails.
- If the point in the Morning II Examination does not reach the pass level, the Afternoon I and Afternoon II Examinations are not graded and the candidate fails.
- If the point in the Afternoon I Examination does not reach the pass level, the Afternoon II Examination is not graded and the candidate fails.

5. Method and Season of Examinations

- IT Passport Examination is conducted by CBT^(Note), and the other examinations are conducted on paper.
- The examinations are scheduled as shown in the table below. IT Passport Examination is conducted as needed^(Note), and the Information Security Management Examination, Fundamental Information Technology Examination, Applied Information Technology Examination, and RISS Examination are conducted twice a year in spring and fall (3rd Sunday in April and October), and the other examinations are conducted once a year in either spring or fall.

[Implementation Period of Each Examination Category]

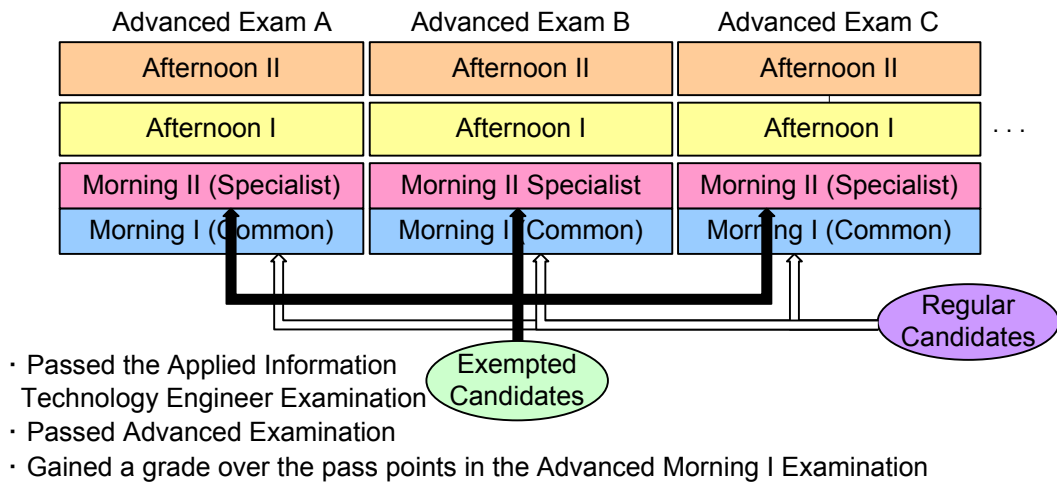
Examination Category		Season	
IT Passport Examination		As needed	
Information Security Management Examination		Spring	Fall
Fundamental Information Technology Engineer Examination		Spring	Fall
Applied Information Technology Engineer Examination		Spring	Fall
Advanced Examinations	Information Technology Strategist Examination		Fall
	Systems Architect Examination		Fall
	Product Manager Examination	Spring	
	Network Specialist Examination		Fall
	Database Specialist Examination	Spring	
	Embedded Systems Specialist Examination	Spring	
	Information Technology Service Manager Examination		Fall
	Systems Auditor Examination	Spring	
Registered Information Security Specialist Examination		Spring	Fall

(Note) People who can't take the examination by CBT because of physical difficulties can take it on paper twice a year in April and October.

6. Exemption System

Candidates for Advanced Examinations and RISS Examination are exempt from sitting the Morning I Examination for 2 years, when they satisfy one of the conditions 1 - 3 below.

- 1) Pass in the Applied Information Technology Engineer Examination.
- 2) Pass in one of the Advanced Examinations or RISS Examination.
- 3) Has gained a grade over the pass points in one of the Advanced or RISS Morning I Examinations.



7. Scope of Questions

(1) IT Passport Examination

IT Passport Examination tests common basic knowledge that is required in order to utilize information technology.

[Scope of Questions in the IT Passport Examination]

Common Career/Skill Framework			Scope of questions to be asked (Concept of exam questions)
Field	Major Category	Middle Category	
Strategy	1 Corporate and legal affairs	1 Corporate activities	<ul style="list-style-type: none"> - Ask about the fundamental concepts about corporate activities and business management. - Ask about the techniques for analyzing familiar business tasks and resolving issues, the concept of PDCA, and operational planning using techniques such as Pareto charts. - Ask about the visual expressions used for understanding business tasks, such as workflow. - Ask about the fundamental concepts of accounting and financial affairs, such as financial statements and break-even points.
		2 Legal affairs	<ul style="list-style-type: none"> - Ask about the familiar laws of workplaces, such as intellectual property rights (copyright law, industrial property rights related laws, etc.), security related laws (act on the prohibition of unauthorized computer access, etc.), Act on the Protection of Personal Information, Labor Standards Act, and Act for Securing the Proper Operation of Worker Dispatching Undertakings and Improved Working Conditions for Dispatched Workers. - Ask about the concepts and characteristics of software license, such as license types and license management. - Ask about the concepts of corporate rules and regulations, such as compliance and corporate governance. - Ask about the significance of standardization.
	2 Business strategy	3 Business strategy management	<ul style="list-style-type: none"> - Ask about the fundamental concepts about typical management information analysis techniques and business management systems, such as SWOT analysis, PPM (Product Portfolio Management), customer satisfaction, CRM, and SCM. - Ask about the understanding of the use of office tools (software packages) such as spreadsheet software, database software, etc.
		4 Technological strategy management	<ul style="list-style-type: none"> - Ask about the understanding of the significance and purpose of technology development strategy.
		5 Business industry	<ul style="list-style-type: none"> - Ask about the characteristics of typical systems in various business fields such as e-commerce, POS systems, IC cards, and RFID application systems. - Ask about the characteristics of typical systems in the engineering field and e-business. - Ask about the characteristics and trends of intelligent home appliances and embedded systems.
	3 System strategy	6 System strategy	<ul style="list-style-type: none"> - Ask about the significance and purpose of information system strategies and the concepts of strategic goals, business improvement, and problem solving. - Ask about the concepts of typical modeling in business models. - Ask about the effective use of groupware for communication and of office tools. - Ask about the purpose and concepts of increasing operational efficiency by using computers and networks. - Ask about the concepts of solution business through typical services, such as cloud computing. - Ask about trends of IT (including IoT, big data, etc) - Ask about the significance and purpose of the promotion and evaluation activities of system utilization.

Common Career/Skill Framework			Scope of questions to be asked (Concept of exam questions)
Field	Major Category	Middle Category	
Management		7 System planning	<ul style="list-style-type: none"> - Ask about the purpose of computerization planning. - Ask about the purpose of the operational requirements definition based on the analysis of current state. - Ask about the fundamental flow of procurement, such as estimates, RFPs, and proposals.
	4 Development technology	8 System development technology	<ul style="list-style-type: none"> - Ask about the fundamental flow of the process of system development such as requirements definition, system design, programming, testing, and software maintenance. - Ask about the concepts of the estimate in system development.
		9 Software development management techniques	<ul style="list-style-type: none"> - Ask about the significance and purpose of typical development models and development methods.
	5 Project management	10 Project management	<ul style="list-style-type: none"> - Ask about the significance, purpose, concepts, processes, and methods of project management.
	6 Service management	11 Service management	<ul style="list-style-type: none"> - Ask about the significance, purpose, and concepts of IT service management. - Ask about the understanding of related matters such as service desks (help desks). - Ask about the concepts about system environment maintenance, such as computers and networks.
		12 Systems audit	<ul style="list-style-type: none"> - Ask about the significance, purpose, concepts, and target of systems audit. - Ask about the flow of systems audit, such as planning, investigating, and reporting. - Ask about the significance, purpose, and concepts of internal control and IT governance.
Technology	7 Basic theory	13 Basic theory	<ul style="list-style-type: none"> - Ask about the fundamental concepts about radix including the characteristics and operations of binary numbers. - Ask about the fundamental concepts about sets, such as Venn diagrams, probability, and statistics. - Ask about the fundamental concepts of how to express information content, such as bits and bytes, and of digitization.
		14 Algorithm and programming	<ul style="list-style-type: none"> - Ask about the fundamental concepts of algorithms and data structures, and how to draw flow charts. - Ask about the roles of programming. - Ask about the types and fundamental usage of markup languages, such as HTML and XML.
	8 Computer system	15 Computer component	<ul style="list-style-type: none"> - Ask about the fundamental configuration and roles of computers. - Ask about the performance and fundamental mechanism of processors, and the types and characteristics of memory. - Ask about the types and characteristics of storage media. - Ask about the types and characteristics of input/output interfaces, device drivers, etc.
		16 System component	<ul style="list-style-type: none"> - Ask about the characteristics of system configurations, of the types of processing, and of the types of usage. - Ask about the characteristics of client/server systems and virtual systems. - Ask about the characteristics of Web systems. - Ask about the concepts of system performance, reliability, and economic efficiency.
		17 Software	<ul style="list-style-type: none"> - Ask about the necessity, functions, types, and characteristics of OSs. - Ask about the concepts and use of basic functions of file management, such as access methods and search methods, and the fundamental concepts of backups. - Ask about the characteristics and fundamental operations of software packages, such as office tools. - Ask about the characteristics of OSS (Open Source Software).

Common Career/Skill Framework			Scope of questions to be asked (Concept of exam questions)
Field	Major Category	Middle Category	
		18 Hardware	<ul style="list-style-type: none"> - Ask about the types and characteristics of computers. - Ask about the types and characteristics of input/output devices.
	9 Technical element	19 Human interface	<ul style="list-style-type: none"> - Ask about the concept and characteristics of interface design, such as GUI and menus. - Ask about the concepts of Web design. - Ask about the concepts of universal design.
		20 Multimedia	<ul style="list-style-type: none"> - Ask about the types and characteristics of encodings such as JPEG, MPEG, and MP3. - Ask about the purpose and characteristics of application of multimedia technology, such as AR (Augmented Reality), VR (Virtual Reality) and CG (Computer Graphics). - Ask about the characteristics of media, and compression and decompression of information data.
		21 Database	<ul style="list-style-type: none"> - Ask about the significance, purpose, and concepts of database management systems (DBMS). - Ask about the concepts of data analysis and design, and the characteristics of database models. - Ask about the manipulation methods such as data extraction. - Ask about database processing methods such as exclusive control and recovery processing.
		22 Network	<ul style="list-style-type: none"> - Ask about the types and configurations of LAN and WAN regarding networks, and the roles of Internet and LAN connection devices. - Ask about the necessity of communication protocols, and the roles of typical protocols. - Ask about the characteristics and fundamental mechanism of the Internet. - Ask about the characteristics of e-mail and Internet services. - Ask about the understanding of the types and characteristics, accounting, and transmission rates of communication services, such as mobile communication and IP phones.
		23 Security	<ul style="list-style-type: none"> - Ask about the fundamental concepts of information security from the viewpoint of safe and secure activities in a network society. - Ask about the information assets, the purpose of risk management, and the concepts of information security policy. - Ask about the concepts, types, and characteristics of technological security measures, such as measures against malware (computer viruses, bots, spyware, etc.) and various attacks (phishing, targeted attacks, etc.) - Ask about the concepts, types, and characteristics of physical and human security measures, such as entrance/exit control and access control. - Ask about the types and characteristics of authentication technologies such as ID, password, digital signature, and biometric authentication. - Ask about the mechanisms and characteristics of encryption technology, such as common key cryptography, public key cryptography, and public key infrastructure (PKI).
		22 Network	<ul style="list-style-type: none"> - Ask about the types and configurations of LAN and WAN regarding networks, and the roles of Internet and LAN connection devices. - Ask about the necessity of communication protocols, and the roles of typical protocols. - Ask about the characteristics and fundamental mechanism of the Internet. - Ask about the characteristics of e-mail and Internet services. - Ask about the understanding of the types and characteristics, accounting, and transmission rates of communication services, such as mobile communication and IP phones.

Common Career/Skill Framework			Scope of questions to be asked (Concept of exam questions)
Field	Major Category	Middle Category	
		23 Security	<ul style="list-style-type: none"> - Ask about the fundamentals of information security from the viewpoint of safe and secure activities in a network society. - Ask about the information assets, the purpose of risk management, and the concepts of information security policy. - Ask about the concepts, types, and characteristics of technological security measures, such as measures against computer viruses. - Ask about the concepts, types, and characteristics of physical and human security measures, such as entrance/exit control and access control. - Ask about the types and characteristics of authentication technologies such as ID, password, callback, digital signature, and biometric authentication. - Ask about the mechanisms and characteristics of encryption technology such as public keys and private keys.

(Note 1) In view of the questions in the exams, the order of fields is: Strategy, Management, Technology.

(Note 2) The major category “Development Techniques” is included in the “Technical Knowledge” field in the Common Career/Skill Framework, but in the Information Technology Passport Examination it is included in the “Management Knowledge” field because questions are centered on the management of software development processes rather than the technical side of software development.

(2) Information Security Management Examination, Fundamental Information Technology Engineers Examination, Applied Information Technology Engineers Examination, Advanced Examinations, and RISS Examination

In the Morning examination, examinees are evaluated through knowledge questions if they reach the expected technology level in the relevant examination category.

In the Afternoon examination, examinees are evaluated through skill questions if they reach the expected technology level in the relevant examination category.

(Morning Examination)

The question fields and the scope of Morning examination questions of each examination category are shown in the tables below.

[Scope of Questions in Morning Examination (Information Security Management Examination)]

➤ **Priority Fields**

Common Career/Skill Framework				Examples of knowledge items (Information Security Management Examination is mainly targeted at "Persons who use IT", so technical items are excluded.)	
Field	Major Category	Middle Category	Minor Category		
Technology	1	Technical elements (security)	1 Security	1 Information Security	confidentiality/integrity/availability of information, threat, malware/malicious program, vulnerability, fraud mechanism, type of attackers and their motivations, cyber-attacks (SQL injection, cross site scripting, DoS (Denial of Service) attack, phishing, password list attack, targeted attack, etc.), cryptography (common key, public key, private key, RSA, AES, hybrid encryption, hash function, etc.), authentication techniques (digital signature, message authentication, time stamp, etc.), user authentication (ID/password, multi-factor authentication, etc.), biometric authentication technique, public key infrastructure (PKI, digital certificate, etc.), etc.
				2 Information security management	overview of information assets and risks, information asset review and classification, risk type, information security risk assessment and its response, information security continuation, information security regulations (internal regulations of the organization including information security policy), ISMS, management measures (information security incident management, compliance with legal and contractual requirements, etc.), information security organizations and institutions (CSIRT, SOC (Security Operation Center), white hacker, etc.), etc.
				3 Security technology evaluation	PCI DSS, CVSS, vulnerability inspections, penetration test, etc.
				4 Information security measures	raising awareness of information security (education, training, etc.), internal fraud prevention guidelines in an organization, measures against malware and malicious program, measures against unauthorized access, measures against information leakage, account management, log management, vulnerability control, entrance and exit control, access control, intrusion detection/intrusion prevention, quarantine network, defense in depth, wireless LAN security (WPA2, etc.), security of mobile devices (cell phone, smartphone, tablet computer, etc.), security products and services (firewall, WAF, DLP, SIEM, etc.), digital forensics, etc.
				5 Security implementation technology	secure protocol (IPsec, SSL/TLS, SSH, etc.), network security, database security, application security, etc.

Common Career/Skill Framework				Examples of knowledge items (Information Security Management Examination is mainly targeted at "Persons who use IT", so technical items are excluded.)		
Field	Major Category	Middle Category	Minor Category			
Strategy	2	Corporate and legal affairs(Legal affairs)	2 Legal affairs	1	Intellectual property rights	Copyright Act, Unfair Competition Prevention Act (trade secrets, etc.), etc.
				2	Laws on security	The Basic Act on Cybersecurity, Act on the Prohibition of Unauthorized Computer Access, Penal Code (crime on computer virus creation, etc.), Act on the Protection of Personal Information, Guidelines for Proper Handling of Specific Personal Information, Act on the Limitation of Liability for Damages of Specified Telecommunications Service Providers and the Right to Demand Disclosure of Identification Information of the Senders, Act on the Regulation of Transmission of Specified Electronic Mail, Standards for Measures against Unauthorized Access to Computers, Standards for Measures against Computer Viruses, etc.
				3	Laws on labor and transaction	Labor Standards Act, outsourcing contract, software contract, license contract, non-disclosure agreement (NDA), Act for Securing the Proper Operation of Worker Dispatching Undertakings and Improved Working Conditions for Dispatched Workers, etc.
				4	Other laws, guidelines, and engineer ethics	compliance, information ethics, engineer ethics, etc.
				5	Standardization	role of related institutions such as JIS, ISO, and IEEE, standardization associations, etc.

Note 1 Priority fields (security, legal) are placed in the beginning as to be in the actual examination..

Note 2 Out of the major/middle categories in "Table of Question Fields by Examination Category (P24)", those not included in the scope of questions of SG Examination (basic theory, development techniques, etc.) are skipped and renumbered from 1 in this table.

➤ **Other fields**

Common Career/Skill Framework				Examples of knowledge items (Information Security Management Examination is mainly targeted at "Persons who use IT", so technical items are excluded.)				
Field	Major category	Middle category	Minor category					
Technology	3	Computer system	3	System components	1	System configuration	system processing mode, usage types of systems, client/server system, web system, thin client system, fault tolerance system, RAID, NAS, SAN, P2P, cluster, etc.	
					2	System evaluation indexes	system performance indexes, system performance characteristics and evaluation, reliability calculation, reliability index, reliability characteristics and evaluation, cost efficiency evaluation, etc.	
	4	Technical elements (except security)	4	Database	1	Database system	types and characteristics of databases, DBMS, etc.	
					2	Database design	data analysis, etc.	
					3	Data manipulation	languages for database operation (SQL, etc.), etc.	
					4	Transaction processing	exclusive control, recovery processing, etc.	
					5	Database application	data warehouse, metadata, big data, etc.	
			5	Network	1	Network architecture	types and characteristics of networks (WAN/LAN, wired or wireless, etc.), internet technology, packet switched network, RADIUS, etc.	
					2	Data transmission and control	transmission method and line, internetworking device, etc.	
					3	Communications protocols	protocols and interfaces, HTTP, IPv6, etc.	
					4	Network management	fault control, etc.	
					5	Network application	internet, intranet, extranet, mobile communication, communication service, etc.	
	Management	5	Project management	6	Project management	1	Project management	project, project management, environment for project, etc.
						2	Project integration management	preparation of project charter, preparation of project plan, direction of project activities, control of project activities, control of change, closing of project phase or project, collection of lessons learned, etc.
3						Project stakeholder management	identification of stakeholders, management of stakeholders, etc.	
4						Project scope management	definition of scope, creation of WBS, definition of activities, control of scope, etc.	
5						Project resources management	creation of project team, estimation of resources, determination of project organization, development of project team, control of resources, project team management, etc.	
6						Project time management	activity sequencing, estimation of activity duration, development of schedule, control of schedule, etc.	
7						Project cost management	estimation of cost, budget planning, control of cost, etc.	
8						Project risk management	identification of risks, evaluation of risks, response to risks, control of risks, etc.	
9						Project quality management	quality planning, execution of quality assurance, execution of quality control, etc.	
10						Project procurement management	procurement planning, supplier selection, management of procurement, etc.	
11						Project communications management	communication planning, distribution of information, management of communications, etc.	

Common Career/Skill Framework				Examples of knowledge items (Information Security Management Examination is mainly targeted at "Persons who use IT", so technical items are excluded.)						
Field	Major category	Middle category	Minor category							
	6	7	Service management	1	Service management	Service Level Agreement (SLA), performance of services and processes, etc.				
				2	Design and transition of services	design and development of services, transition, acceptance criteria of services, handover of operations, etc.				
				3	Service management process	service level management, service reporting, continuation of services and availability management, capacity management, supplier management, incident and service requirement management, problem management, configuration management, change management, release and deployment management, etc.				
				4	Operation of services	system operations management, operation, service desk, monitoring and operations of systems, etc.				
				5	Facility management	facility management (power supply, air-conditioning, etc.), maintenance and protection of facilities, etc.				
		8	Systems audit	1	Systems audit	significance and purpose of system audits, system auditability, system audit quality evaluation, information security audit, etc.				
				2	Internal control	significance and purpose of internal control, mutual check and balance (separation of job duties), IT governance, CSA (Control Self Assessment), etc.				
				7	System strategy	9	System strategy	1	Information systems strategy	significance and purpose of information system strategy, computerization promotion system, etc.
						2		Business process	BPR, business improvement, etc.	
						3		Solution business	types of solution business and service arrangement, ASP, cloud computing (SaaS, PaaS, IaaS, etc.), etc.	
4	System utilization promotion and evaluation	information literacy, data utilization, effective utilization of IT (IoT, AI, etc.), popularization and awareness raising, evaluation and verification of information system utilization, information system disposal, etc.								
10	System planning	1	Computerization planning	information system installation risk analysis						
		2	Requirements definition	requirements analysis, user needs study, current state analysis, definition of problems/issues, operational requirements definition, functional requirements definition, non-functional requirements definition, etc.						
		3	Procurement planning and implementation	procurement plan, request for proposal (RFP), proposal evaluation criteria, estimates, proposals, vendor selection, etc.						
8	Corporate and legal affairs (other than legal affairs)	11	Corporate activities	1	Management and organization theory	business management, PDCA, management organization (CIO, CEO, others), human resources (case studies, others), behavioral science (leadership, communication, etc.), risk management, BCP, etc.				
				2	OR/IE	inspection techniques (sampling, simulation, etc.), quality control techniques (seven QC tools, new seven QC tools, others), etc.				
				3	Accounting and financial affairs	financial statements, depreciation, break-even point, cost, lease and rental etc.				

[Scope of Questions in Morning Examination (Fundamental Information Technology Engineers Examination, Applied Information Technology Engineers Examination, Advanced Examinations, and RISS Examination)]

Field	Major Category	Middle Category	Minor Category	Examples of Knowledge Items
Technology	1 Basic theory	1 Basic theory	1 Discrete mathematics	binary number, radix, numeric representation, arithmetic precision, set, Venn diagram, logical operation, proposition, etc.
			2 Applied mathematics	probability, statistics, numerical analysis, formula manipulation, graph theory, queueing theory, etc.
			3 Theory about information	coding theory, predicate logic, automaton, formal language, computational complexity, artificial intelligence (AI), knowledge engineering, learning theory, compiler theory, programming language theory and semantics, etc.
			4 Theory of communications	transmission theory (transmission channel, modulation and demodulation technique, multiplexing, error detection and correction, signal synchronization technique) etc.
			5 Theories of measurement and control	signal processing, feedback control, feed-forward control, response characteristics, control stability, various controls, types of sensors and actuators and their operating characteristics, etc.
		2 Algorithm and programming	1 Data structure	stack and queue, list, array, tree structure, binary tree, etc.
			2 Algorithm	Understanding of sorting, merging, search, recursion, character string processing, flowchart, etc.
			3 Programming	programming by using existing programming languages (coding convention, program structure, data type, grammar notation, etc.), etc.
			4 Programming languages	types and characteristics of programming languages (assembler language, C, C++, COBOL, Java ¹⁾ , ECMAScript, Perl, PHP, Python, Ruby, etc.), Common Language Infrastructure (CLI), etc.
			5 Other languages	types and characteristics of markup languages (HTML, XML, etc), Data Description Language (DDL), etc.
	2 Computer system	3 Computer components	1 Processor	types of computers and processors, and their configurations and operating principles, interrupts, performance and characteristics, structure and architecture, RISC and CISC, instructions and addressing, multicore processor, etc.
			2 Memory	types and characteristics of memory, memory system structure and storage hierarchy (cache, main memory, auxiliary storage), access method, RAM file, memory capacity and performance, types and characteristics of storage media, etc.
			3 Bus	Types and characteristics of bus, bus system structure, bus control method, bus access mode, bus capacity and performance, etc.
			4 Input /output interface	types and characteristics of input/output devices, input/output interface, device driver, synchronization with device, analog-digital conversion, DMA, etc.
			5 Input /output device	input device, output device, display device, auxiliary storage device and storage media, communication control unit, drive unit, imaging device, etc.
4 System components		1 System configuration	system processing mode, types of systems, system application area, visualization, client/server system, Web systems, thin client system, fault tolerant system, RAID, NAS, SAN, P2P, High Performance Computing (HPC), clusters, etc.	

Field	Major Category	Middle Category	Minor Category	Examples of Knowledge Items
			2 System evaluation indexes	system performance index, system performance characteristics and evaluation, significance and purpose of system reliability and economy, reliability calculation, reliability index, reliability characteristics and evaluation, cost efficiency evaluation, capacity planning, etc.
		5 Software	1 Operating system	types and characteristics of OSs, functions of OS, multiprogramming, virtual storage, job management, process/task management, data management, input/output management, storage management, interrupt, bootstrap, etc.
			2 Middleware	role and functions of various middleware (API for OS, Web API, various libraries, componentware, shells, development framework, etc.), selection and use of middleware, etc
			3 File system	types and characteristics of file systems, access method, search method, directory management, backup, file organization, etc.
			4 Development tools	design tool, building tools, test tool, language processing tools (compiler, interpreter, linker, loader), emulator, simulator, in-circuit emulator (ICE), tools chain, integrated development environment, etc.
			5 Open source software	types and characteristics of OSS, Unix-family OSs, open source community, LAMP/LAPP, open source library, considerations in the use and utilization of OSS (safety, reliability, etc.), trends, etc.
		6 Hardware	1 Hardware	electric and electronic circuit, machine and control, logical design, components/elements and implementation, semiconductor device, system LSI, SoC (System On a Chip), FPGA, MEMS, diagnostic programs, power consumption, etc.
	3 Technical element	7 Human interface	1 Human interface technology	information architecture, GUI, voice recognition, image recognition, moving image recognition, feature extraction, learning function, interactive system, usability, accessibility, etc.
			2 Interface design	form design, screen design, code design, Web design, human centered design, universal design, usability evaluation, etc.
		8 Multimedia	1 Multimedia technology	Authoring environment, sound processing, still image processing, moving image processing, media integration, compression, decompression, MPEG, etc.
			2 Application of multimedia	AR (Augmented Reality), VR (Virtual Reality), CG (Computer Graphics), media application, motion capture, etc.
		9 Database	1 Database system	types and characteristics of databases, database model, DBMS, etc.
			2 Database design	data analysis, logical design of database, data normalization, performance design of database, physical design of database, etc.
			3 Data manipulation	database manipulation, languages used to manipulate databases (SQL, etc.), relational algebra, etc.
			4 Transaction processing	exclusive control, recovery processing, transaction management, database performance enhancement, data control, etc.
			5 Database application	data warehouse, data mining, distributed database, repository, metadata, big data, etc.

Field	Major Category	Middle Category	Minor Category	Examples of Knowledge Items
		10	Networks	<p>1 Network architecture types and characteristics of networks, (WAN/LAN, wired/wireless, sensor network, etc.) internet technology, calculation associated with line, packet exchange network, QoS, RADIUS, etc.</p> <p>2 Data transmission and control transmission method and line, internetworking device, digital service unit, power line communication (PLC), OSI basic reference model, media access control (MAC), data link control, routing control, flow control, etc.</p> <p>3 Communication protocols network virtualization (SDN, NFV, etc), protocols and interfaces, TCP/IP, HDLC, CORBA, HTTP, DNS, SOAP, IPv6, etc.</p> <p>4 Network management network operations management (SNMP), fault control, performance management, traffic monitoring, etc.</p> <p>5 Network application Internet, intranet, extranet, mobile communication, network OS, communication service, etc.</p>
		11	Security	<p>1 Information security Confidentiality/integrity/availability of information, threat, malware/malicious programs, vulnerability, fraud mechanisms, types of attackers and their motivation, cyber attack, (SQL injection, cross site scripting, DoS (Denial of Service) attack, phishing, password list attacks, targeted attack, etc.), cryptography (common key, public key, private key, RSA, AES, hybrid encryption, hash function, etc.), authentication technique (digital signature, message authentication, time stamp, etc.), user authentication (ID/password, multi-factor authentication, identity linking (OpenID, SAML) etc.), biometric authentication technique, public key infrastructure (PKI, certificate authority, digital certificate, etc.), government public key infrastructure (GPKI, Bridge Certification Authority, and so on), etc.</p> <p>2 Information security management overview of information assets and risks, information asset review and classification, risk types, information security risk assessment and risk response, information security continuation, information security regulations (internal regulations of the organization including information security policy), ISMS, management measures (information security incident management, compliance with legal and contractual requirements, etc.) information security organizations and institutions (CSIRT, SOC (Security Operation Center), white hacker, etc.</p> <p>3 Security technology evaluation ISO/IEC 15408 (common criteria), JISEC (Japan Information Technology Security Evaluation and Certification Scheme), JCMVP (Japan Cryptographic Module Validation Program), PCI DSS, CVSS, vulnerability inspections, penetration tests etc.</p>

Field	Major Category	Middle Category	Minor Category	Examples of Knowledge Items
			4 Information security measures	information security awareness (education, training, etc.), internal fraud prevention guidelines in the organization, measures against malware and malicious programs, measures against unauthorized access, measures against information leakage, account management, log management, vulnerability management, entrance and exit control, access control, intrusion detection/intrusion prevention, quarantine network, defense in depth, wireless LAN security (WPA2, etc.), security of mobile device (cell phone, smartphone, tablet computer, etc.), security products and services (firewalls, WAF, DLP, SIEM, etc.), digital forensics, etc.
			5 Security implementation technology	secure protocols (IPSec, SSL/TLS, SSH, etc.), authentication protocols (SPF, DKIM, SMTP-AUTH, OAuth, DNSSEC, etc.), secure OS, network security, database security, application security, secure programming, etc.
	4 Development technology	12 System development technology	1 System requirements definition	system requirements definition (functions; performance; requirements from tasks, organizations, and users; design constraints; qualification requirements; etc), evaluation of system requirements, etc.
			2 Systems architecture design	establishing the architecture at the top level of the system (functional decomposition of hardware, software, and manual work; hardware architecture design; software architecture design; system processing architecture design; database architecture design; etc.), evaluation of systems architecture, etc.
			3 Software requirements definition	establishment of software requirements (function, performance, interface, etc), evaluation of software requirements, hearing, use case, prototype, DFD, E-R diagram, UML, etc.
			4 Software architecture design and software detailed design	software structure and component design, interface design, software unit test design, software integration test design, software quality, review, walk-through, evaluation of software design, process-oriented design, data-oriented design, structured design, object-oriented design, module design, partitioning into components and reuse, architecture pattern, design pattern, etc.
			5 Software construction	creation of software units, coding conventions, coding support method, code review, metrics measurement, debugging, test method, test preparation (test environment, test data, etc.), test execution, test result evaluation, etc.
			6 Software integration and software qualification tests	test planning, test preparation (test environment, test data, etc.), test execution, test result evaluation, etc.
			7 System integration and system qualification tests	test planning, test preparation (test environment, test data, etc.), test execution, test result evaluation, tuning, test types (function test, non-function requirement test, performance test, load test, security test, regression test, etc.), etc.
			8 Installation	creation of installation plan of system or software, execution of installation of system or software, etc.

Field	Major Category	Middle Category	Minor Category	Examples of Knowledge Items				
			9	Acceptance support	acceptance review and acceptance test for system or software, delivery and acceptance of system or software, user manual, education and training, etc.			
			10	Maintenance and disposal	maintenance style of system or software, maintenance procedure of system or software, disposal of system or software, etc.			
			13	Software development management techniques	1	Development process and methods	software development model, agile development, process maturity level, software life cycle process (SLCP), reuse of software, structured method, formal method, reverse engineering, mashup, etc.	
					2	Intellectual property application management	copyright management, patent management, inventory management, technical protection (copy guard, DRM, activation, etc.), etc.	
					3	Development environment management	development environment operation status management, development environment construction, design data management, tool management, license management, etc.	
					4	Configuration management and change control	establishment of configuration identification system, change control, configuration status recording, assurance of the integrity of items, release management and shipment, etc.	
		5			Project management	project, project management, environment for project, project governance, project life cycle, project constraints, etc.		
		Management	5	14	Project management	2	Project integration management	preparation of project charter, preparation of a project plan, direction of project activities, control of project activities, control of change, closing of project phase or project, collection of learned lessons, etc.
						3	Project stakeholder management	identification of stakeholders, management of stakeholders, etc.
						4	Project scope management	definition of scope, creation of WBS, definition of activities, control of scope, etc.
						5	Project resources management	creation of project team, estimation of resources, determination of project organization, development of project team, control of resources, project team management, etc.
6	Project time management					activity sequencing, estimation of activity duration, development of schedule, control of schedule, etc.		
7	Project cost management					estimation of cost, budget planning, control of cost, etc.		
8	Project risk management					identification of risks, evaluation of risks, response to risks, control of risks		
9	Project quality management					quality planning, execution of quality assurance, execution of quality control		
10	Project procurement management					procurement planning, supplier selection, management of procurement, etc.		
11	Project communications management					communications planning, distribution of information, management of communications, etc.		
	6					Service management	15	Service management

Field	Major Category	Middle Category	Minor Category	Examples of Knowledge Items					
			2	Design and transition of services	service planning, design & development and transition of services, acceptance criteria of services, handover of operations, etc.				
			3	Service management process	process for providing services (service level management, service reporting, continuation of services and availability management, budgeting and accounting services, capacity management), related process (business relationship management, supplier management), resolution process (incident and service requirement management, problem management), integrated control process (configuration management, change management, release and deployment management), etc.				
			4	Operation of services	system operations management, operation, service desk, operational resource management, monitoring and operations of systems, schedule design, operations support tools (monitoring tools, diagnostic tools, etc.), etc.				
			5	Facility management	facility management including equipment such as power supply and air conditioning, maintenance and protection of facilities, environmental aspects, etc.				
		16	Systems audit	1	Systems audit	significance and purpose of systems audits, targeted business operations of systems audits, systems auditability, qualifications for systems auditor, systems audit planning, systems audit implementation (preliminary audit, main audit, evaluation, conclusions), systems audit reporting, systems audit quality evaluation, systems audit standards, systems audit techniques, audit evidence, audit work paper, information security audit, assurance-based audit, consulting-based audit, computer aided audit technique (CAAT), etc.			
				2	Internal control	significance and purpose of internal control, mutual checks (separation of job duties) internal control reporting system, IT governance, evaluation and improvement of internal control, CSA (Control Self Assessment), etc.			
		Strategy	7	System strategy	17	System strategy	1	Information system strategy	significance and purpose of information system strategy, total optimization policy, total optimization planning, computerization promotion system, computerization investment planning, business model, business operations model, information systems model, EA (Enterprise Architecture), program management, system owner, data owner, process framework, quality control (quality control framework), information systems strategy evaluation information systems strategy implementation management, IT investment management, IT management capability index, etc.
							2	Business process	BPR, analysis of business operations, business improvement, design of business operations, BPM (Business Process Management), BPO, SFA, offshore, etc.
							3	Solution business	solution business types and service arrangement, business package, problem solving support, ASP, SOA, cloud computing (SaaS, PaaS, IaaS, etc.), etc.

Field	Major Category	Middle Category	Minor Category	Examples of Knowledge Items
			4 System utilization promotion and evaluation	information literacy, data utilization, popularization and awareness raising, human resource training plan, evaluation and verification of information system utilization, digital divide, information system disposal etc.
		18 System planning	1 Computerization planning	computerization initiative, basic computerization policy, total development schedule, project promotion framework, staff training planning, development return on development investment, investment decision making methods (PBP, DCF method, etc.), IT portfolio, system life cycle, information system installation risk analysis, etc.
			2 Requirements definition	requirements analysis, user needs study, current state analysis, definition of problems/issues, requirements definition method, operational requirements definition, functional requirements definition, non-functional requirements definition, verification of stakeholder requirements, verification of the consistency with the information system strategy , etc.
			3 Procurement planning and implementation	procurement plan, procurement requirements, procurement conditions, RFP (Request For Proposal), proposal evaluation criteria, estimates, proposals, vendor selection, procurement risk analysis, internal & external manufacturing criteria, software asset management, software supply chain management, etc.
	8 Business strategy	19 Business strategy management	1 Business strategy techniques	competition strategy, differentiation strategy, blue ocean strategy, core competence, M&A, alliance, group management, corporate philosophy, SWOT analysis, PPM, value chain analysis, growth matrix, outsourcing, shared service, incubator, etc.
			2 Marketing	marketing theory, marketing techniques, marketing analysis, LTV (Life Time Value), consumer behavior model, advertisement strategy, brand strategy, price strategy, etc.
			3 Business strategy and goal/evaluation	business strategy planning, business environment analysis, needs/wants analysis, competitive analysis, PEST analysis, strategic targets, CSF, KPI, KGI, balance score card, etc.
			4 Business management system	CRM, SCM, ERP, decision support, knowledge management, EIP (Enterprise Information Portal), etc.
		20 Technological strategy management	1 Planning of technology development strategy	product trend, technology trend, success case, idea creation, core technology, technology research, technology acquisition, technology licensing, technological tie-up, MOT (Management Of Technology), industry-academia-government collaboration, standardization strategy, etc.
			2 Technology development plan	technical development investment planning, technology development site planning, human resources planning, technology roadmap, product application roadmap, patent acquisition roadmap, etc.
		21 Business industry	1 Business system	distribution information system, logistics information system, public information system, medical information system, financial information system, e-Government, POS system, XBRL, smart grid, Web conference system, ubiquitous computing, etc.

Field	Major Category	Middle Category	Minor Category	Examples of Knowledge Items
			2 Engineering system	significance and purpose of engineering system, production management system, MRP, PDM, CAE, etc.
			3 e-business	EC (electronic commerce such as BtoB and BtoC), electronic payment system, EDI, IC card and RFID application system, social media (SNS, mini-blogs, etc.), long tail, etc.
			4 Consumer appliances	audio and video equipment, household electrical appliances, personal information appliances (cell phone, smartphone, tablet terminal, etc.), educational and entertainment equipment, computer peripherals/OA equipment, industrial terminal equipment, consumer communications terminals, etc.
			5 Industrial devices	communication devices, transport/construction equipment, industrial equipment/ FA equipment/ industrial robots, facility equipment, medical devices, analytical/measurement instruments, etc.
	9 Corporate and legal affairs	22 Corporate activities	1 Management and organization theory	business management, PDCA, management organization (divisional system, company system, CIO, CEO, etc), corporate governance, CSR, IR, corporate identify, green IT, human resources (OJT, management by objectives, case studies, discretionary labor system, etc), behavioral science (leadership, communication, technical writing, presentation, negotiation, motivation), TQM, risk management, BCP, IPO (Initial Public Offering), etc.
			2 OR/IE	LP (Linear Programming), inventory problem, PERT/CPM, game theory, analysis techniques (work analysis, PTS, work sampling, etc), inspection techniques (OC curve, sampling, simulation, etc), quality control techniques (seven QC tools, new seven QC tools, and so on), etc.
			3 Accounting and financial affairs	financial accounting, management accounting, accounting standards, financial statements, consolidation accounting, depreciation, break-even point, financial indicators, initial cost, lease and rental, cash planning and cash management, asset management, economy computation, IFRS, etc.
		23 Legal affairs	1 Intellectual property rights	Copyright Act, Industrial Property Law, Unfair Competition Prevention Act, (trade secrets, etc.), etc.
			2 Laws on security	The Basic Act on Cybersecurity, Act on the Prohibition of Unauthorized Computer Access, penal code (penalty on computer virus creation, etc.), Act on the Protection of Personal Information, Guidelines for the Proper Handling of Specific Personal Information, Act on the Limitation of Liability for Damages of Specified Telecommunication Service Providers and the Right to Demand Disclosure of Identification Information of the Senders, Act on the Regulation of Transmission of Specified Electronic Mail, standards of measures against unauthorized access to computers, standards of measures against computer virus, etc.

Field	Major Category	Middle Category	Minor Category	Examples of Knowledge Items
			3	Laws on labor and transaction Labor Standards Act, laws on labor, outsourcing contract, software agreement, license agreement, OSS license (GPL, BSD license, etc.), public domain, creative commons, NDA (Non-Disclosure Agreement), Act against Delay in Payment of Subcontract Proceeds, Etc. to Subcontractors, Act for Securing the Proper Operation of Worker Dispatching Undertakings and Improved Working Conditions for Dispatched Workers, civil code, commercial code, Whistleblower Protection Act, Act on Specified Commercial Transactions, etc.
			4	Other laws, guidelines, and engineer ethics compliance, information disclosure, Telecommunication Business Law, network related laws and regulations, Companies Act, Financial Instruments and Exchange Law, Act for Promotion of Use of Recycled Resources, tax laws, export-related laws and regulations, System Management Standards, Software Management Guidelines, information ethics, engineer ethics, professionalism, etc.
			5	Standardization roles of JIS, ISO, IEEE, and other associated bodies, standardization organizations, international certification framework (accreditation/certification/inspection bodies), various codes (character codes, etc.), JIS Q 15001, ISO 9000, ISO 14000, etc.

Note 1: Java is a trademark or a registered trademark of Oracle Corporation and/or its affiliates in the United States and other countries.

Note 2: ITIL is a registered trademark of AXELOS Limited.

(Afternoon Examinations)

The scope of Afternoon examination questions of each examination category are shown below.

Information Security Management Examination (SG)

- 1 Information Security Management Planning and Information Security Requirements
 - a) Planning of information assets management
Identification of information assets and clarification of values, clarification of management responsibility and acceptable range of use, creation of information assets ledger, etc.
 - b) Information security risk assessment and risk response
Identification/analysis/evaluation of risks, consideration of measures against risks, formulation of plan for responding risks, etc.
 - c) Presenting information security requirements regarding information assets
Physical and environmental security, technical and operational security concerning information systems of the department, etc.
 - d) Presenting information security requirements to continuously ensure information security
- 2 Operations and Continual Improvement of Information Security Management
 - a) Management of information assets
Maintenance and management of information assets ledger, media management, recording the status of use, etc.
 - b) Ensuring information security when using information systems of the department
Protection from malware, backup, log collection and monitoring, maintaining information security in forwarding information, vulnerability control, user access control, inspection of operating conditions, etc.
 - c) Ensuring information security in outsourcing business operations and processes
Review of information security of the vendors, implementation of information security management at the vendors, completion of outsourcing, etc.
 - d) Management of information security incidents
Detection, initial process, analysis and recovery, proposal and implementation of preventive measures against recurrence, collection of evidence, etc.
 - e) Raising awareness of information security
Education and training concerning information security, advice concerning information security, prevention of information leakage through internal fraud, etc.
 - f) Maintaining compliance
Guidance for compliance, evaluation and improvement of the status of compliance, etc.
 - g) Continual improvement of information security management
Organizing and analyzing issues, revising information security regulations (internal regulations in the organization including information security policy), etc.
 - h) Collecting and evaluating case examples and trends related to information security

Fundamental Information Technology Engineer Examination (FE)

- 1 Computer Systems
 - a) Hardware
Expression in numbers, characters, graphics, and sound, processing apparatus, storage devices and media, input/output devices, instruction execution methods, addressing methods, system

- configuration, etc.
- b) Software
 - OSs, middleware, application software, language processing tools, etc.
- c) Databases
 - Database types and characteristics, data models, normalization, DBMS, database languages (SQL), etc.
- d) Networks
 - Network configuration, internet, intranet, protocols, data transmission, transmission control, etc.
- 2 Information Security
 - Information security policy, information security management, database security, network security, application security, physical security, access control, encryption, authorization, anti-malware measures (computer viruses, bots, spyware, etc.), countermeasures against unauthorized access, personal information protection, etc.
- 3 Data Structure and Algorithms
 - Arrays, list structure, tree structure, graphs, sorting, search, numeric calculation, character string processing, graphics processing, file processing, computational complexity, error, etc.
- 4 Software Design
 - Software requirements definition, software formula design, software detailed design, structured design, module design, object-oriented design, web application design, test planning, human interfaces, etc.
- 5 Software Development
 - Programming (C, COBOL, Java, assembly, spreadsheet software), testing, debugging, etc.
- 6 Management
 - a) Project Management
 - Project plan, estimation methods, quality management, schedule management, cost management, staffing management, risk management, etc.
 - b) Service Management
 - Service management process (service level management, continuation of services and availability management, capacity management, incident and service requirement management, problem management, change management, etc.), operation of services (system operations management, operation, service desk), etc.
- 7 Strategy
 - a) System Strategy
 - Information system strategy (total computerization plan, business model, etc.), business process improvement (BPR, etc.), solution business, etc.
 - b) Management strategy / corporate and legal affairs
 - Management strategy methods (outsourcing, competitive superiority, SWOT analysis, etc.), marketing (marketing theory, marketing tools, etc.), corporate activities, accounting/financial affairs, legal affairs, standardization, etc.

Applied Information Technology Engineer Examination (AP)

- 1 Business Strategy
 - Marketing, business analysis, business and corporate strategy, corporate finance, business value evaluation, business continuity plan (BCP), accounting/financial affairs, leadership theory, etc.
- 2 Information Strategy

- Business models, product strategy, organizational operation, outsourcing strategy, information industry trends, information technology trends, international standardization trends, etc.
- 3 Strategy Planning and Consulting Techniques
Logical thinking, presentation techniques, balance score card and SWOT analysis, etc.
 - 4 System Architecture
Formula design and functional decomposition, request for proposals (RFP), requirements analysis, reliability and performance, web technology, (including web services and SOAs), visualization technology, knowledge of tasks in major industries, application of software package and open source software, other trends in new technologies, etc.
 - 5 Service Management
Service management process (service level management, continuation of services and availability management, budgeting and accounting services, capacity management, incident and service requirement management, problem management, configuration management, change management, release and deployment management, etc.), operation of services (system operations management, operations management for virtual environment, operation, service desk, etc.), etc.
 - 6 Project Management
Project planning and management (scope, process, quality, budget, personnel, procurement, risks, communication), etc.
 - 7 Networks
Network architecture, protocols, Internet, intranet, VPN, communication traffic, wired and wireless communication, etc.
 - 8 Databases
Data models, normalization, DBMS, database languages (SQL), database system operation and maintenance, etc.
 - 9 Embedded Systems Development
Realtime OS and MPU architecture, energy saving, high reliability design and memory management, sensors and actuators, embedded system design, individual applications (mobile phone, car, household appliances, etc.) etc.
 - 10 Information Systems Development
External design, internal design, test planning and testing, standardization and componentialization, development environment, object-oriented analysis (UML), software lifecycle process (SLCP), individual application systems (ERP, SCM, CRM, and so on), etc.
 - 11 Programming
Algorithms, data structure, program creation technology (programming languages, markup languages), web programming, etc.
 - 12 Information Security
Information security policy, information security management, risk analysis, database security, network security, application security, physical security, access control, encryption, authorization, PKI, firewall, anti-malwar measures (computer viruses, bots, spyware, etc.), countermeasure against unauthorized access, personal information protection, etc.
 - 13 Systems Audit
IT governance, auditing of information system and embedded system planning, development, operation, and maintenance, information security auditing, personal information protection auditing, collaboration and adjustment with other audits (accounts audits, task audits, etc.), systems audit planning, implementation, and reporting, systems audit related laws and regulations, etc.

Information Technology Strategist Examination (ST)

- 1 Formulation or support of business strategy utilizing information technology, reflecting the business characteristics of each industry
Formulation of business strategy utilizing information technology based on a management strategy, business model development proposals using information technology, business reform planning, proposals to increase the added value of new products and services, selection of system solutions, formulation of outsourcing strategy, etc.
- 2 Formulation of information system strategy and overall systemization plans, reflecting the business characteristics of each industry
Definition of task models, definition of overall information systems, analysis and prioritization of information system development issues, formulation of information system infrastructure configuration policy and standard, formulation of system solution application policy (ERP packages, etc), formulation of mid to long-term information systemization plans, formulation of information system section operation policy, formulation of overall IT control preparation policy, formulation and implementation of business continuity plan (BCP), analysis of system risks, formulation of disaster response plan, formulation of information systemization annual plans, etc.
- 3 Formulation of individual systemization concepts and plans, reflecting the business characteristics of each industry
Formulation of systemization concepts, definition of system problems of tasks, task system analysis, task model creation, task process design, organization of systemized functions and formulation of system methods, formulation of system selection policy (application of system solutions, etc), creation of overall development schedule, formulation of project execution structure, preparation of request for proposals (RFP), proposal evaluation and selection of suppliers, estimation of costs and system return on investment, etc.
- 4 Execution control and evaluation of information system strategy considering the assumptions and restrictions of each business
Progress management of overall reform program for products, services, work, organization, and information systems; standardization promotion of information system infrastructure standard and system-related quality management standard; risk control and handling of reform execution; promoting the application of system solutions; promotion of system utilization; analysis, evaluation, and improvement of reform program effects, costs, and risks; performance evaluation of business strategy, information system strategy, overall systemization plan, and individual systemization plans; etc.
- 5 Formulation and promotion of planning, development, support, and maintenance plans for embedded systems
Technical trends analysis of communications, information, architecture, human interface, storage, semiconductors, measurement, control, and platforms; development of product strategy in consideration of trends in a product market and in-house technical evaluations; organization of considerations for intellectual property, regulations, laws, safety and environmental measures for products; risk analysis; formulation of procurement policy; evaluation of consistency with management strategy; verification and adjustment of requirements; etc.

Systems Architect Examination (SA)

[Information Systems]

- 1 Contracts and Agreements
Request for Proposals (RFP) and proposals preparations, project planning support, etc.
- 2 Planning
Verification of target task content, analysis of target task systems, investigation of applicable information technology, creation of task models, organization of systemized functions and formulation of system methods, clarification of basic policy for service levels and quality, consideration of feasibility, formulation of system selection policy, estimation of cost and system return on investment, etc.
- 3 Requirements Definition
Identification of requirements and definition of constraints, definition of task requirements, materialization of requirements for the organization and environment, definition of functional requirements, definition of non-functional requirements, definition of schedule-related requirements, etc.
- 4 Development
System requirements definition, system formula design, software requirements definition, software formula design, software detailed design, system integration, system qualification verification testing, software installation, system installation, software acceptance support, system acceptance support, etc.
- 5 Operation and Maintenance
Operational testing, task and systems migration, system operation evaluation, task operation evaluation, evaluation of return on investment and task effects, understanding and correction analysis of maintenance-related problems, etc.
- 6 Related Knowledge
Configuration management, quality assurance, auditing, related legislation, trends in information technology, etc.

[Embedded Systems]

- 1 Functional Requirements Analysis, Determination of Functional Specifications, etc.
Functional requirements analysis for development systems, quality requirements analysis, development process design, cost design, performance design, compilation of functional specifications, related technology, etc.
- 2 Determination of Hardware and Software Requirements Specifications that Satisfy Functional Specifications
Hardware and software trade-off, functional decomposition analysis, functional decomposition into system components, determination of interface specifications between devices, creation of software and hardware requirements specification documents, system architecture design, reliability design, design for ease of maintenance, selection of realtime operating systems, etc.
- 3 Determination of Development Method according to an Embedded System
Model-based design, process model design, object-oriented model design, etc.
- 4 Use of Generic Modules
Module design, reuse, configuration management, etc.

Project Manager Examination (PM)

1 Initiating Project and Establishment of Project Plan

Project, project management, environment for project, project governance, project life cycle, project constraints, preparation of project charter, identification of stakeholders, creation of project team, definition of scope, requirements and estimates, creation of WBS, definition of activities, estimation of resources, determination of project organization, activity sequencing, estimation of activity duration, development of schedule, estimation of cost, budget planning, identification of risks, evaluation of risks, quality planning, procurement planning, communications planning, preparation of a project plan, RFP (Request For Proposal), laws and standards, etc.

2 Project Implementation and Control

Direction of project activities, control of project activities, control of change, management of stakeholders, control of scope. development of project team, control of resources, project team management, control of schedule, control of cost, response to risks, control of risks, execution of quality assurance, execution of quality control, supplier selection, confidentiality and contract management, management of procurement, distribution of information, management of communications, internal control of project, etc.

3 Project Closing

Project evaluation techniques and applicable technologies, evaluation indexes after project completion, analysis of differences between project plan and actual results, evaluation of acceptance results, evaluation of contract compliance status, collection of learned lessons, compilation of project completion reports, closing of project phase or project, etc.

Network Specialist Examination (NW)

1 Network System Planning, Requirements Definition and Development

Network system requirements analysis, logical design, physical design, reliability design, performance design, security design, address design, operation design, implementation, testing, transition, evaluation (performance, reliability, quality, economy, etc), improvement proposals, etc.

2 Network System Operation and Maintenance

Network system operation and maintenance, security management and structure, etc.

3 Network Technology and Related Legislation and Standards

Network system configuration technology, traffic-related technology, security technology, reliability design technology, encoding/data transmission technology, network related laws and ethics, network related domestic and international standards, other standards, etc.

4 Networks Service Utilization

Use techniques and evaluation techniques of different kinds of network services that have been brought or are being brought to the market, technology for migration from the current system, etc.

5 Network Application Technology

e-mail, file transfer, Web access technology, inter-application communication, content distribution, etc.

Database Specialist Examination (DB)

1 Database System Planning, Requirements Definition, and Development

Database system planning, requirements definition, creation of concept data models, code design, physical database design and construction, data operation design, access performance estimation,

- security design, etc.
- 2 Database System Operation and Maintenance
Database operation and maintenance, data resource administration, performance management, capacity management, reorganization, reconfiguration, backing up, recovery, data transition, security management, etc.
 - 3 Database Technology
Repositories, relationship models, relational algebra, normalization, database management systems, SQL, exclusive control, data warehouse, other trends in new technology, etc.

Embedded Systems Specialist Examination (ES)

- 1 Embedded Systems Design and Construction
Functional requirements analysis of development systems, quality requirements analysis, hardware-software trade-off that satisfies functional requirements, creation of software and hardware specification documents, system architecture design, realtime design, functional safety design, high reliability design, environmental safety design, security design, overall performance projection, electricity saving design, consideration of testing methods, development environment design, etc.
- 2 Embedded Systems Software Design
Application of realtime OS, device driver design, task design, shared resources design, investigation of software requirements specifications for software implementation and the process for carrying it out, software formula design, software detail design, software code creation and testing, software integration testing, system verification testing, configuration management, change control, etc.
- 3 Embedded Systems Hardware Design
Hardware requirements specifications, MPU or MCU selection, investigation of system LSI, use of high level hardware design language, hardware architecture design, memory level design, consideration of peripheral devices, hardware component performance evaluation, communication interface design, high reliability design, failure analysis, consideration of human interfaces, system verification testing, EMC evaluation, measures against defects, development and testing environment construction, consideration of problems relating to electricity and machinery, investigation on protection, etc.

Information Technology Service Manager Examination (SM)

- 1 Service Management
Service management (requirements of services, service management system, risk management, etc.), establishment and improvement of service management system (implementation planning, execution of implementation and operation, monitoring and review, development and management of improvement plans, etc.), etc.
- 2 Design and Transition of Services
Planning of new services or service changes, design & development, transition (acceptance of application system, acceptance of services, acceptance criteria of services, etc.), etc.
- 3 Service Management Process
Process for providing services (service level management, service reporting, continuation of services and availability management, budgeting and accounting services, capacity management), related process (business relationship management, supplier management), resolution process

- (incident and service requirement management, problem management, integrated control process (configuration management, change management, release and deployment management), etc.
- 4 Operation of Services
System operations management (operations management, fault management, failure operation methods, performance tuning, etc.), operation (monitoring and operations of systems, operation status management, job scheduling, backup and restore, storage management of configuration items, etc.), service desk, etc.
 - 5 Information Security Operation and Management
ISMS, information asset management, information security incident, risk evaluation, physical security, access control, network security solution, etc.
 - 6 Facility Management
Basic hardware and software technology, system maintenance management, data center facility management, equipment management, etc.

Systems Auditor Examination (AU)

- 1 Information Systems, Embedded Systems and Communication Networks
Management in general, information strategy, information systems (application system, software package, cloud computing, mobile computing, etc.), embedded systems, communication networks (Internet, wired/wireless LAN, etc.), software lifecycle models, project management, IT service management, incident management, IT risk management, quality management, information security management and information security technologies (measure against unauthorized access to computer, measure against cybercrime, measure against malware, etc.), business continuity management, etc.
- 2 General Systems Audit
IT governance, IT control, auditing of information system and embedded system planning, development, operation, and maintenance work, business continuity management audit, system development project audit, information security audit, personal information protection audit, collaboration and adjustment with other audits (accounts audits, task audits), etc.
- 3 Planning, Implementation and Reporting of Systems Audits
Audit planning, risk approach, audit implementation, audit reporting, follow-up implementation, CAAT (data analysis tool, electronic audit record system, etc.), digital forensics, CSA, systems audit tasks and management (including quality management of audit tasks), etc.
- 4 Systems Audit Related Legislation
Information security related laws and regulations (penal code, act on the prohibition of unauthorized computer access, act on the limitation of liability for damages of specified telecommunications service providers, personal information protection laws, intellectual property laws, labor related legislation, statutory audit legislation (Companies Act, Financial Instruments and Exchange Act, etc.), standards, guidelines and measures related to systems auditing and information security auditing, standards, guidelines and measures for internal auditing and internal control, etc.

Registered Information Security Specialist Examination (SC)

- 1 Information Security System Planning, Requirements Definition, Development, Operation, and Maintenance

- Information system planning, requirements definition, and development; physical security measures; application security measures including Web applications; secure programming; database security measures; network security measures; system security measures; etc.
- 2 Information Security Operation
Information security policy, risk analysis, task continuity planning, information security operation and management, vulnerability analysis, misuse analysis, unauthorized access countermeasures, incident response, user security management, fault recovery planning, information security education, systems auditing (security aspects), internal control, etc.
 - 3 Information Security Technology
Access management techniques, encryption technology, authorization technology, anti-malware technology (computer viruses, bots, spyware, etc.), attack methods (social engineering, cyber attack, etc.), security application systems (signature authentication, intrusion detection systems, firewalls, secure communication technology (VPN, etc), key management technology, PKI, etc. Peripheral devices are also included as target), methods of attack, log administration techniques for audit trails, etc.
 - 4 Development Management
Development lifecycle management, system document configuration management, distribution and operation, human management methods (structure to prevent violations within the team), information security management for the development environment, etc.
 - 5 Information Security Related Legal Requirements
Information security related legislation, domestic and international standards, guidelines, copyright law, personal information protection, information ethics, etc.

(3) Information Technology Terms and Specifications of Programming Languages used in Examination Questions

Information technology terms and the specifications of programming languages used in the examination questions are shown as in the URL below.

http://www.jitec.ipa.go.jp/1_04hanni_sukiru/_index_hanni_skill.html (Japanese only)

Reference About Syllabuses (Details of knowledge and skills)

“Syllabuses” for each examination category are available to the public to be used as learning guidelines or educational guidelines. They are details of knowledge and skills, composed of goal, contents and sample terms for each learning item, in which the scopes of exam questions are described in more detail and the breadth and the depth of knowledge and skills required for each examination are organized and clarified.

http://www.jitec.ipa.go.jp/1_04hanni_sukiru/_index_hanni_skill.html (Japanese only)

Annex Breakdown of Number of Questions per Field in the Fundamental Information Technology Engineer Examination and Applied Information Technology Engineer Afternoon Examination

Fundamental Information Technology Engineer Examination (13 questions of which 7 are to be answered)

Field	Question 1	Questions 2~7	Question 8	Questions 9~13
Hardware		○ x 3		
Software				
Databases				
Networks				
Information Security	●			
Data Structure & Algorithms			●	
Software Design		○		
Software Development				● x 5 (Note)
Project Management		○		
Service Management				
System Strategy				
Management/Corporate and Legal Affairs		○		
Number of Questions	1	6	1	5
Required Number of Answers	1	4	1	1

● = compulsory questions ○ = elective questions

(Note) In the Software Development field, there is 1 question on each of C, COBOL, Java, assembly language, and spreadsheets. 1 question out of these must be selected and answered.

Applied Information Technology Engineer Examination (11 questions of which 5 are to be answered)

Field	Question 1	Questions 2~11
Management Strategy		○
Information Strategy		
Strategy Planning/Consulting Techniques		
System Architecture		○
Networks		○
Databases		○
Embedded System Development		○
Information System Development		○
Programming (Algorithms)		○
Information Security	●	
Project Management		○
Service Management		○
Systems Audit		○
Number of Questions	1	10
Required Number of Answers	1	4

● = compulsory question ○ = elective questions

Ver 3.0 October, 2016

■Outline of Information Technology Engineers Examination & Registered Information Security Specialist Examination■



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