

■ Information Technology Engineers Examination —————

IT Passport Examination  
(Level 1)  
Syllabus

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

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**IPA**

INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

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## ■ Introduction

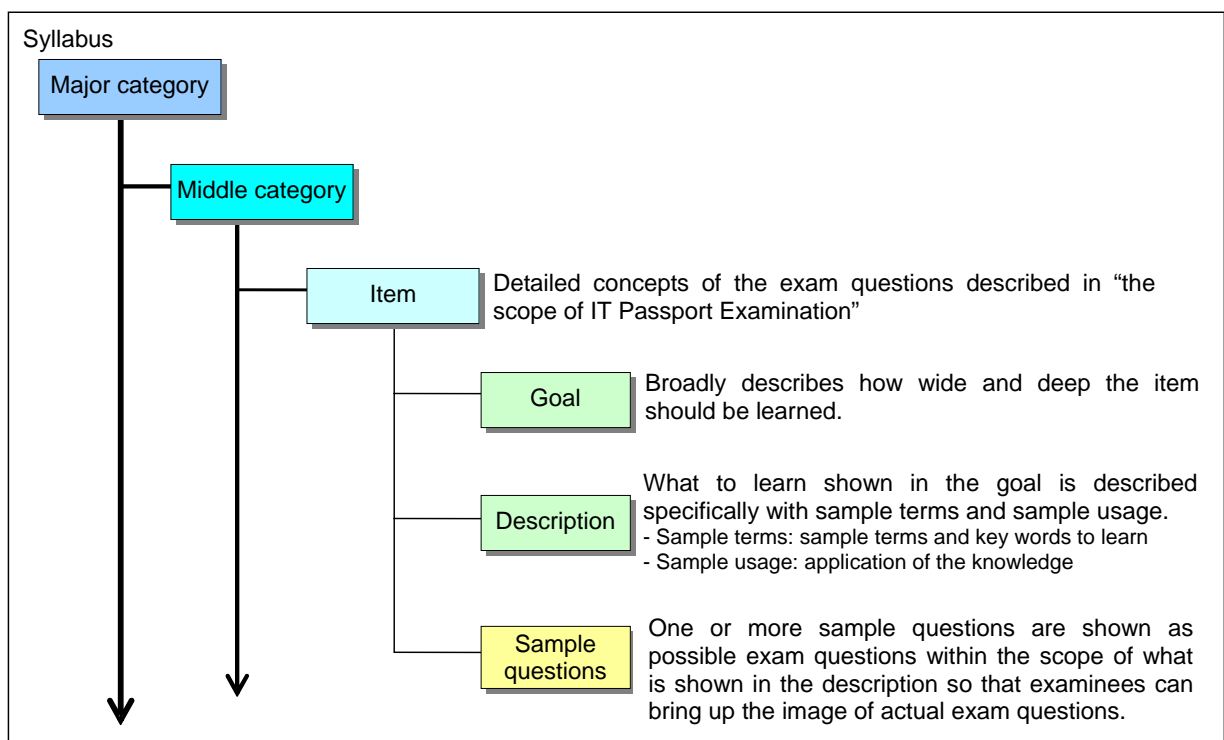
The syllabus (subtitled as “details of the knowledge required for the Information Technology Engineers Examination”) for the IT Passport Examination, in which “the scope of exam questions”<sup>1</sup> is described in more detail and the breadth and depth of the knowledge required for Level 1 are organized and clarified, has been defined and then published here.

It is expected that this syllabus will be used effectively as learning guidelines for examinees who aim to pass the examination, and also as instructional guidelines in the educational process within companies and schools.

Please note that the detailed information in this syllabus might be added, changed, or deleted, based on technology trends and other factors.

## ■ Configuration of the syllabus

As shown in the following chart, this syllabus provides a set of a learning target, a description, and one or more sample questions (a total of 71 questions) for every item.



<sup>1</sup> “Outline of IT Engineers Examination” 7. Scope on the test  
[http://www.jitec.ipa.go.jp/1\\_00topic/topic\\_20081027\\_hani.html](http://www.jitec.ipa.go.jp/1_00topic/topic_20081027_hani.html)

# Strategy

**Major category 1: Corporate and legal affairs**

**Middle category 1: Corporate activities**

## 1. Management and organization theory

### [Goal]

- Understand the fundamental concepts about corporate activities and business management.

### [Description]

- ✓ Understand the fundamental activities in companies to understand the assigned business tasks for which you may be responsible. Understand the concepts and techniques, such as PDCA, to grasp and solve the problems regarding assigned business tasks.

### (1) **Corporate activities and management resources**

Understand the fundamental concepts about corporate activities and management resources.

#### (a) Corporate activities

Understand the purposes of corporate activities.

**Sample terms** corporate philosophy, closing account, CSR (Corporate Social Responsibility)

#### (b) Management resources

Understand the meaning and need for management of people, materials, money, and information in business management.

### (2) **Business management**

Understand the fundamental concepts of business management.

**Sample terms** business objectives; financial affairs, property, human resources, information management; PDCA (Plan, Do, Check, and Act)

### (3) **Management organization**

Understand fundamental management organizations.

**Sample terms** hierarchical organization, divisional organization, matrix organization, company system, project organization

### (4) **Computer literacy**

Apply information technology to the given business tasks knowing what can be done by computers and what cannot be.

### Sample question

**Q1.** Which of the following is the organization that is established by selecting personnel from related departments, who have the required skills and experiences, to perform system development?

- a) Divisional organization
- b) Functional organization
- c) Project organization
- d) Matrix organization



## 2. OR and IE

### [Goal]

- Analyze familiar business tasks, and understand and utilize typical techniques for solving problems.
- Understand practical methods of how to visually describe business tasks and utilize them.

### [Description]

- ✓ Understand familiar business tasks under the supervisor's guidance, and understand and utilize the typical visual representations, OR (Operations Research) and IE (Industrial Engineering) techniques, required for analysis.

#### (1) Understanding business tasks

Utilize visual representations such as a workflow diagram to understand details of business tasks.

#### (2) Job analysis and operational planning

Perform job analysis and operational planning using typical techniques, such as diagrams.

**Sample terms** Pareto chart, PERT (arrow diagram), scatter diagram, radar chart, control chart, histogram, bar graph, pie chart, line graph, regression analysis

**Sample usage** data analysis using tables or graphs, business improvement using a Pareto chart, business improvement using regression analysis

#### (3) Decision making

Make decisions to efficiently solve a problem.

**Sample terms** cause and effect diagram (fishbone diagram), simulation, and inventory control

**Sample usage** decision making under the provided conditions, understanding of business tasks dealing with inventory control

#### (4) Problem-solving techniques

Understand the concepts about the fundamental techniques for solving problems.

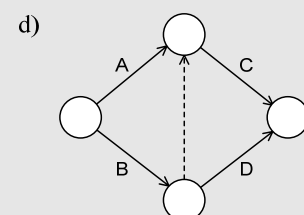
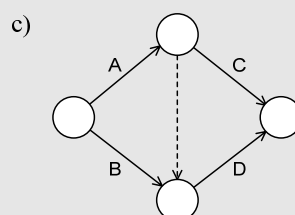
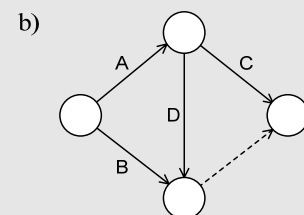
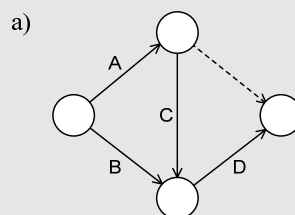
**Sample term** brainstorming

### Sample question

**Q2.** A list of activities for a project plan is shown below. Which of the following represents it as an arrow diagram?

#### [List of activities]

Activity	Preceding activities
A	None
B	None
C	A
D	A, B



### 3. Accounting and financial affairs

#### [Goal]

- Understand the fundamental concepts of accounting and financial affairs for corporate activities and business management.

#### [Description]

- ✓ For corporate activities or business management, understand the meanings and concepts of basic terms about accounting and financial affairs, such as a break-even point, and utilize them in familiar business tasks.

#### (1) Accounting and financial affairs

Understand the relationship between sales and profits.

##### (a) Relationship between sales and profits

Understand terms and concepts, such as profit, gross profit, operating profit, break-even point, and cost.

**Sample terms** variable cost, fixed cost, volume of sales

**Sample usage** simple calculation of a break-even point and profit ratio

##### (b) Types and roles of financial statements

Understand the types and roles of financial statements in companies, such as an income statement, and account titles.

**Sample terms** balance sheet, cash flow statement, assets (net assets, current assets, fixed assets, deferred assets, tangible assets, intangible assets), liabilities (current liabilities, fixed liabilities), current ratio, profitability

**Sample usage** reading of fundamental financial statements

#### Sample question

**Q3.** Which of the following should be inserted in the blank box A of the income statement shown below? Here, the shaded boxes are intentionally left blank.

#### Income statement

Unit: billion yen

Sales	100
Cost of sales	75
<input type="text"/>	25
Selling, general and administration expense	15
<input type="text"/>	10
Non-operating income	2
Non-operating expense	5
<input type="text"/> A	7
Extraordinary profit	0
Extraordinary loss	1
Net profit before tax	6
Corporate income tax, etc.	2
<input type="text"/>	4

- a) Gross profit
- b) Operating profit
- c) Ordinary profit
- d) Current term net profit

#### 4. Intellectual property rights

**[Goal]**

- Understand the types of intellectual property rights, the rights that should be protected by law, and the kinds of actions that are illegal.

**[Description]**

- ✓ Understand that the rights to intellectual creations, such as computer programs, music, and images, are protected by the related laws for the purpose of protecting corporate activities that conform to compliance.

**(1) Copyright Act**

Understand that intellectual creations, such as music, movies, and computer programs, are covered by copyright and that copying without permission is illegal. In addition, understand that copyright is associated with the people who present the work, such as singers and broadcasting companies, and that presenting the work to the public without permission is illegal.

**(2) Laws on industrial property rights**

Understand that there are rights protected by registering an invention or the design of a new car, and understand that unapproved use is illegal.

**Sample terms** Patent Act, Utility Model Act, Design Act, Trademark Act

**(3) Unfair Competition Prevention Act**

Understand that there is a law protecting trade secrets that are not protected by the Copyright Act and the laws on industrial property rights.

**(4) Software license**

Understand that a software license is a contract with the person or corporate body who owns the rights to grant permission to use the software.

**Sample usage** understanding terms and conditions of a license, and the contract suitable for the purpose

**(5) Other rights**

Understand that there are “rights of portrait” and “rights of publicity” under legal precedents, even if the clearly stated law is undefined.

**Sample question**

**Q4.** Among the actions involving a commercially available book of landscape pictures without obtaining the author’s permission, which of the following is illegal under the Copyright Act?

- a) Taking a photograph of the same object as a photograph you like
- b) Cutting out a photograph from the book and putting it on the wall of your room
- c) Placing and publishing a photograph from the book on your Web page
- d) Describing comments about the photograph book in your blog

## 5. Laws on security

### [Goal]

- Understand the kind of action that is unauthorized access as regulated by law.

### [Description]

- ✓ Understand that there is a law governing unauthorized access (Act on the Prohibition of Unauthorized Computer Access) that can punish even if there is no actual damage.

### (1) **Act on the Prohibition of Unauthorized Computer Access**

Understand unauthorized access and how to prevent it. In addition, understand the fundamental concepts of the Act on the Prohibition of Unauthorized Computer Access.

### Sample question

**Q5.** Which of the following is considered unauthorized access under the Act on the Prohibition of Unauthorized Computer Access?

- a) Having access to a shared server and copying a software package illegally without permission
- b) Having access to a computer via the Internet by using other people's passwords
- c) Posting accessible information that libels others on the Internet
- d) Having access to a website with obscene pictures

## 6. Laws on labor and transaction

### [Goal]

- Understand the outline of familiar laws on labor.
- Understand the outline of familiar laws on transaction.

### [Description]

- ✓ Learn that there are laws on labor and transaction to improve various conditions associated with labor and transaction, and understand their outlines.

### (1) **Laws on labor**

Understand the fundamental concepts of “Labor Standards Act” and “Act for Securing the Proper Operation of Worker Dispatching Undertakings and Improved Working Conditions for Dispatched Workers.”

- (a) Labor Standards Act  
Understand that the law regulates what must be observed in a labor contract, such as minimum wages, overtime work wages, and working hours.
- (b) Act for Securing the Proper Operation of Worker Dispatching Undertakings and Improved Working Conditions for Dispatched Workers  
Understand that there are regulations that dispatching business operators must observe, such as a license required to dispatch workers.
- (c) Nondisclosure agreement  
Understand that there is a contract governing trade secrets that should be kept confidential.

- (d) **Contract types**  
Understand the fundamental characteristics of a service contract and a dispatch contract as contract types. In addition, understand the difference of each contract form, such as a service contract and a dispatch contract.

**Sample terms** (quasi-)mandate contract, employment contract

**(2) Laws on transaction**

Understand the fundamental concepts of “the Act against Delay in Payment of Subcontract Proceeds, Etc. to Subcontractors” and “the Product Liability Act”.

- (a) **Act against Delay in Payment of Subcontract Proceeds, Etc. to Subcontractors**  
Understand that this law protects the interests of the subcontractors by preventing a delay in payment of subcontract proceeds, etc.
- (b) **Product Liability Act**  
Understand that a manufacturer is liable for damages when the consumers suffer loss of or injury to life, body, and property because of a defective product.

**Sample question**

**Q6.** Which of the following explains the Labor Standards Act?

- a) A law that guarantees minimum wages for the stability of lives and the improvement in manpower quality
- b) A law enacted to improve the welfare of part-time workers
- c) A law about business that dispatches workers with the required skills to companies
- d) A law that regulates minimum standards for labor conditions, such as working hours, breaks, and vacations

**7. Other laws, guidelines, and engineer ethics**

**[Goal]**

- Understand the concepts about the norms of companies and control your actions rightly.
- Understand the fundamental concepts of information disclosure requests to governmental agencies.

**[Description]**

- ✓ Understand the practical approaches to compliance and corporate governance to clarify the norms of companies, and understand the concepts of related laws and guidelines. In addition, understand the information disclosure requests for documents created by governmental agencies.

**(1) Compliance**

In order to support improvements in compliance by companies as business workers, understand and practice the codes of ethics that should be observed in addition to laws in performing business tasks.

- (a) **Act on the Protection of Personal Information**  
Understand the protection of personal information, the relevant employers, and the duty regulations.

- (b) Various standards  
Learn that the Standards of Measures against Computer Viruses, the Standards of Measures against Unauthorized Access to Computers, and the System Management Standards are used as norms for information security.
- (c) Information ethics  
Understand and practice the legal imperatives and guidelines that you should comply with in an information society, such as protection of intellectual property, personal information, and privacy, as well as morals and netiquette.
- (2) **Corporate governance**  
Learn about the practical approaches to corporate governance to improve the health of management activities for winning the trust of customers and markets.
- (3) **Information disclosure requests to governmental agencies**  
Learn that anyone can submit a request for disclosure of documents created by governmental agencies.

#### Sample question

- Q7.** Company X, which is “a business operator handling personal information,” held a seminar for individual customers to promote the sales of their products, which included a questionnaire for the participants at the end. The questionnaire sheet stated that the purpose for obtaining personal information was to offer information about future products; the company asked for the customer’s name, address, telephone number, and whether or not they wanted the information. Which of the following actions by Company X is illegal in light of the Act on the Protection of Personal Information?
- a) A list of customers was created from the collected questionnaires, and direct mails were sent to the customers who wanted information about products.
  - b) The collected questionnaires and the customer list created after the seminar were stored in a locker with a key, except when they were necessary.
  - c) For sales promotion of the product by Company Y, which is an associated company of Company X, Company X handed the customer list created from the collected questionnaires over to Company Y based on the judgment of Company X.
  - d) A customer who had wanted information about products contacted Company X to change the address, so Company X changed the customer list after verifying the identity of the customer and the desire to receive further information.

## 8. Standardization

### [Goal]

- Understand the significance of standardization.

### [Description]

- ✓ Recognize that standardization organizations, such as ISO and IEC, standardize for compatibility, and recognize the significance of the activity, along with familiar examples of standardization.

(1) **Standardization**

Understand the need and significance of standardization.

(2) **Examples of the standardization in IT**

Learn the examples and the characteristics of familiar standardizations in IT.

**Sample terms** bar code, JAN (Japanese Article Number) code, QR Code

(3) **Standardization organizations and specifications**

Learn about typical international standardization organizations, domestic standardization organizations, and the familiar examples of specifications.

**Sample terms** ISO (International Organization for Standardization),  
IEC (International Electrotechnical Commission),  
IEEE (Institute of Electrical and Electronics Engineers),  
W3C (World Wide Web Consortium),  
JIS (Japanese Industrial Standards),  
ISO9000 (quality management system),  
ISO14000 (environmental management system),  
IEEE802.3 (wireless LAN related specifications)

**Sample question**

**Q8.** Which of the following describes the characteristics of the QR Code in the figure shown below?



- a) It compresses and symbolizes an image and is used for communication of information.
- b) It contains only about 10 bytes of information and is used for encryption of commercial product codes.
- c) It is a kind of two-dimensional bar code and can record much information, including alphanumeric characters, Kanji characters, etc.
- d) It is the code developed for use in IC tags and can be used for noncontact-based merchandise management.

**Major category 2: Business strategy**  
**Middle category 3: Business strategy management**

**9. Business strategy techniques**

**[Goal]**

- Understand the fundamental concepts about typical analysis methods of management information.
- Apply office tools (software packages) to familiar business tasks.

**[Description]**

- ✓ Use the techniques of analyzing the information about corporate activities under the supervisor's guidance, and understand the fundamental concepts of analysis methods of management information leading to business strategy.
- ✓ For solving problems and increasing efficiency for assigned business tasks, use office tools.

**(1) Analysis methods of management information**

Understand the typical techniques about utilizing information for business strategy, and learn to read analysis results.

**Sample terms** SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, PPM (Product Portfolio Management), external environment, internal environment

**Sample usage** sales, market, and product analysis using analysis methods

**(2) Terms on business strategy**

Understand the typical terms on business strategy.

**Sample terms** competitive superiority, customer satisfaction, core competence, alliance, outsourcing, M&A (Mergers and Acquisitions), CEO (Chief Executive Officer), CIO (Chief Information Officer)

**(3) Using office tools**

Utilize office tools (software packages), such as word-processing software, spreadsheet software, database software, and presentation software, for solving problems and increasing the efficiency of assigned business tasks.

**Sample usage** selecting tools according to usage; using tools for arrangement, search, analysis, processing, and representation of data

**Sample question**

**Q9.** A SWOT analysis is an analysis method that examines opportunities and threats, and strong and weak points in planning strategy. Which of the following is included in the scope of subjects to evaluate strong and weak points?

- a) The number of competitive companies
- b) Prices of its own products
- c) Growth of the targeted market
- d) Trends in Japanese economy



## 10. Marketing

### [Goal]

- Understand the fundamental concepts relevant to marketing.

### [Description]

- ✓ Learn the existence and purpose of marketing, and understand the concepts of using information in marketing by collection and analysis of related data.

#### (1) **Basics of marketing**

Understand the fundamental concepts and information utilization about marketing.

**Sample terms** marketing research, sales; product and purchase plan; sales promotion; customer satisfaction

**Sample usage** sales promotion dealing with customer analysis

### Sample question

**Q10.** Which of the following explains one-to-one marketing?

- a) It assumes the status of the company from its market share and performs activities suitable for the status.
- b) It satisfies each customer's need rather than targeting a group called a market.
- c) It develops the products and marketing mix suitable for the needs of the segment.
- d) It produces and distributes a single product in large volumes, targeting all customers.

## 11. Business strategy and goal/evaluation

### [Goal]

- Understand the typical information analysis techniques for planning business strategies.

### [Description]

- ✓ Understand the techniques aiming at target setting and evaluation as the typical information analysis techniques for planning business strategies.

#### (1) **Information analysis techniques for business strategy planning and evaluation**

Understand the fundamental information analysis techniques and terms for target setting and evaluation about planning of business strategies. Learn the missions as the corporate philosophy and the visions as what the company wants to be.

**Sample terms** BSC (Balanced Score Card), CSF (Critical Success Factors), value engineering

**Sample usage** job analysis using the fundamental information analysis techniques

### Sample question

**Q11.** Which of the following is the perspective of a balanced scorecard other than three perspectives: financial, customer, and business processes?

- a) Learning and growth
- b) Communication
- c) Product
- d) Advantage

## 12. Business management system

### [Goal]

- Understand the fundamental concepts of the business management system.

### [Description]

- ✓ Learn that there is a business management system to perform business management effectively and understand its fundamental concepts.

### (1) **Business management system**

Understand the fundamental terms and concepts about business management system.

**Sample terms** CRM (Customer Relationship Management), value chain management, SCM (Supply Chain Management)

### Sample question

**Q12.** Which of the following explains SCM?

- a) This is a technique that strengthens relations with customers and connects them to improvement in corporate earnings by managing the exchanges with customers consistently while sharing information between the departments related to customers.
- b) This is a technique of sharing the objective knowledge, experiences, and know-how, which each employee obtained from business activities, as the knowledge of the whole company with a network.
- c) This is a technique for centrally managing the data generated at business tasks, such as sales, production, accounting, and personnel affairs, with an integrated database, and understanding the situation of each operation department in real time.
- d) This is a technique of optimizing the whole business process by sharing and managing information between the companies and the departments that participate in a series of processes from procurement of components to production, distribution, and sales.

### **13. Planning of technology development strategy and technology development plan**

**[Goal]**

- Understand the significance and the purpose of technology development strategies.

**[Description]**

- ✓ Understand that technology development is promoted by the road map created based on the prediction of technology trends.

**(1) Technology development strategy and technology development plan**

Learn that the technology development strategies are created, which consider technical cooperation if needed, by surveying and analyzing technology trends and product trends, and evaluating technology owned by the company, for the purpose of obtaining competitive power in the future market. Learn that specific technology development will be advanced based on a road map after an approach to technology based on a technological strategy is planned.

**Sample question**

**Q13.** This is a technique used for the prediction of future technology trends that are needed for planning technical development strategies. Collection of opinions from multiple experts, statistical analysis of collected opinions, and feedback of the analyzed opinions are repeated to form an opinion. Which of the following is this technique?

- a) Scenario writing
- b) Delphi method
- c) Brainstorming
- d) Role-playing

## 14. Business system

### [Goal]

- Understand the characteristics of typical systems in various business fields.

### [Description]

- ✓ In order to understand how the system is utilized in various business fields, learn the characteristics and concepts of the typical systems that are used in business fields, such as distribution and finance.

### (1) **Systems in typical business fields**

Understand the characteristics of systems in typical business fields.

**Sample terms** distribution information system, financial information system, POS (Point of Sales) system, GPS (Global Positioning System) application system, ETC (Electronic Toll Collection) system, IC card, RFID (IC tag), electronic money

**Sample usage** business improvement using IC cards or RFID

### (2) **Software packages in typical business systems**

Learn the characteristics of the software packages in typical business systems.

**Sample terms** ERP (Enterprise Resource Planning) package, software package for each job role (accounting, marketing support, sales management software), software package for each industry (software packages for finance, medical services, production, transportation)

### (3) **Systems in other fields**

Learn that there are typical administrative systems such as the Basic Resident Register Network System, and an electronic application and notification system.

### Sample question

**Q14.** This is a card that the card companies issue to members in cooperation with banks and stores. The member has only to present a card when shopping, without paying cash. Accounts will be settled later based on the contract between the card companies and consumer members. Which of the following is the card?

- a) ID card
- b) Credit card
- c) Debit card
- d) Prepaid card

**Q15.** Which of the following describes the characteristics of a traceability system?

- a) This uses computers for solutions by compiling a database or creating a program with expertise in the fields that need professional knowledge, such as medical diagnosis.
- b) This delivers ordering information to business partners from a handy terminal successively so that a shortage of goods may not take place in retail stores.
- c) This makes it possible to track history information about production and distribution of food from the consumption location back to the production location.
- d) This supports unprogrammed decision-making for solving management problems interactively.

## 15. Engineering system

### [Goal]

- Understand the characteristics of typical systems in the engineering field.

### [Description]

- ✓ Learn the characteristics and concepts of typical engineering systems to understand the system usage situation in the engineering field.

#### (1) IT utilization in the engineering field

Understand the significance of IT utilization in the engineering field, such as “the support of design and production by automation” and “the promotion of efficiency in production management and inventory control.”

#### (2) Typical engineering systems

Understand the characteristics of typical engineering systems, such as CAD (Computer Aided Design) and CAM (Computer Aided Manufacturing).

**Sample terms** FA (Factory Automation), CIM (Computer-Integrated Manufacturing)

### Sample question

**Q16.** When profit per month that can be calculated from the table is the largest, how many pieces of Product *B* are produced in one month? Here, the person-days per month are 280.

	Profit per product (yen)	Workload per product (person-days)	Production capacity per month (pieces)
Product <i>A</i>	200,000	4	25
Product <i>B</i>	160,000	4	30
Product <i>C</i>	90,000	3	40

- a) 15                      b) 20                      c) 25                      d) 30

## 16. e-business

### [Goal]

- Understand electronic commerce and the characteristics of typical systems.

### [Description]

- ✓ Learn the characteristics, including risks, to understand familiar electronic commerce using a network.

#### (1) Electronic commerce

Understand the fundamental concepts of electronic commerce.

##### (a) The characteristics of electronic commerce

Learn the fundamental characteristics, including that, in product sales by electronic commerce, the cost for stores or salesclerks can be reduced and a business can be started with little investment.

- (b) The classifications of electronic commerce

Learn the types of electronic commerce.

**Sample terms** EC (Electronic Commerce), B2B (Business to Business), B2C (Business to Consumer), C2C (Consumer to Consumer), B2E (Business to Employee)

- (c) Using electronic commerce

Learn the specific examples of usage of electronic commerce.

**Sample terms** electronic marketplace, online mall, electronic auction, Internet advertising, Internet banking, Internet trading

**(2) Points to note in electronic commerce**

Recognize risks in electric commerce and the need of security measures, and understand the fundamental points to note.

**Sample question**

**Q17.** Which of the following forms of EC (Electronic Commerce) is B2C?

- a) A company places an order with an external vendor for materials using Web-EDI.
- b) An employee applies for service with a discount privilege on the sales site for employees in a company.
- c) A company submits an electronic bid for construction work for which the country or the local governments place an order.
- d) A customer purchases books at an online shop in a virtual mall.

## **17. Consumer appliances and industrial devices**

**[Goal]**

- Learn the concepts of embedded systems and typical examples.

**[Description]**

- ✓ In order to understand the embedded systems utilized in familiar appliances and devices, learn its fundamental characteristics and examples.

**(1) Embedded systems**

Understand the fundamental concepts of what an embedded system is.

**(2) Consumer appliances and industrial devices**

Understand the fundamental concepts of what a consumer appliance is and what an industrial device is.

**(3) Examples of embedded systems**

Learn the examples of familiar embedded systems.

- (a) Consumer appliances

Learn the examples of typical consumer appliances, such as rice cookers, washing machines, air-conditioners, cell phones, and PDA (Personal Digital Assistants).

- (b) Industrial devices

Learn the examples of typical industrial devices, such as industrial robots, automatic warehouse systems, and vending machines.

Sample question

**Q18.** What are the products, such as television sets, refrigerators, and air conditioners equipped with a communication facility connectable to networks, such as the Internet, called collectively?

- a) AV household appliances
- b) PC household appliances
- c) Intelligent home appliances
- d) Multifunctional household appliances

## **18. Information systems strategy**

### **[Goal]**

- Understand the significance and purpose of information system strategies and the concepts of strategic goals.

### **[Description]**

- ✓ Understand the significance and purpose of information system strategies planned to realize business strategies and the concepts of strategic goals.

### **(1) Information systems strategy**

Understand that an information system is developed to achieve the business strategy and enterprise strategy of a company.

**Sample terms** SFA (Sales Force Automation)

### **(2) Strategic goals**

Understand that business strategy and enterprise strategy are established as a specific goal through business environment analysis and a SWOT analysis.

### **Sample question**

**Q19.** Which of the following is the model that can be used for representing the target business tasks in planning of an information systems strategy to clarify what the information system should be?

- a) Waterfall model
- b) Spiral model
- c) Business process model
- d) Prototyping model

## **19. Business process**

### **[Goal]**

- Understand the concepts of business improvement and problem solving.
- Understand the concepts of typical modeling in business models.
- Utilize groupware and office tools effectively.
- Understand the purpose and concepts of increasing operational efficiency by using computers and networks.

### **[Description]**

- ✓ Understand the concepts of modeling the business process and considering its improvement plan so that you can participate in a study of computerization of your assigned business tasks under the supervisor's guidance.
- ✓ Utilize computers and networks effectively to improve business and facilitate communication.



**(1) Business process**

For business improvement and problem solving, it is necessary to analyze and understand the present business process. Understand the concepts of the typical modeling used in that case

(a) Modeling

Understand the concepts of modeling, which indicate the business scheme and business process visually.

(b) Typical modeling techniques

Learn the concepts of the typical modeling methods.

**Sample terms** E-R diagram (Entity Relationship Diagram), DFD (Data Flow Diagram)

(c) Fundamentals about analysis and improvement of business processes

Learn the typical techniques and systems about modeling of business processes.

**Sample terms** BPR (Business Process Reengineering), BPM (Business Process Management), workflow system

**(2) Business improvement and problem solving**

Understand that the efficiency of business tasks can be increased by utilizing computers and networks efficiently for familiar business tasks. In addition, acquire the ability to analyze business processes, make business improvement, and solve problems. Understand the details of business tasks from workflows and E-R diagrams to interpret business data such as tables and graphs, find problems, and improve them.

**(3) Effective use of IT**

Understand various methods for business improvement and operational efficiency by utilizing IT. In addition, in order to perform smooth communication needed for business improvement and operational efficiency, understand how to use specific tools and use them for business tasks.

(a) Operational efficiency by computerization

Computerization includes various methods such as the installation of commercial software packages, installation of groupware and office tools, development and installation of individual information systems, and network construction. Understand the characteristics and advantages of each method.

(b) System utilization for communication

Understand how to use groupware and office tools effectively.

**Sample terms** video conference, e-mail, electronic bulletin board, blog, chat, SNS (Social Networking Service)

**Sample usage** utilization of e-mail for business tasks, upload of shared files

**Sample question**

**Q20.** Which of the following is the concept of reviewing an existing organization and business rules radically and redesigning job roles, workflows, administrative functions, and information systems?

a) BPR

b) ERP

c) RFP

d) SLA

## 20. Solution business

### [Goal]

- Understand the concepts of solutions through typical services.

### [Description]

- ✓ In order to understand the concepts of solutions, learn the offering methods and sample usage of typical solutions.

#### (4) **Solutions**

Learn the process of solution offering in computerization. Understand that, in the solution business, it is necessary to build a trusting relationship with customers, learn about customer problems, propose problem solutions, and support the problem solving.

#### (5) **The forms of solutions**

Understand that the solutions for computerization include various approaches such as in-house development, introduction of software packages, and utilization of services provided by other companies.

**Sample terms** SaaS (Software as a Service), ASP (Application Service Provider), outsourcing, hosting service, housing service, SOA (Service Oriented Architecture)

### Sample question

**Q21.** Which of the following is a service that offers application functions via the Internet, characterized by the multi-tenant system, where one system is used by multiple companies?

- a) ISP (Internet Service Provider)
- b) SaaS (Software as a Service)
- c) Housing service
- d) Hosting service

## 21. System utilization promotion and evaluation

### [Goal]

- Understand the significance and purpose of promotion activities of system utilization.

### [Description]

- ✓ In order to take advantage of information systems in business management, understand that education and the dissemination of information technology, learn information literacy skills, and make the most use of data in assigned business tasks.

#### (1) **Information literacy**

In order to perform business tasks, search, organize, analyze, and transmit information by taking advantage of information technology such as computers and application software.

#### (2) **Utilization of Data**

Analyze data accumulated through information systems to improve business and solve problems in assigned business tasks.

#### (3) **Dissemination and education**

Understand the significance of education and the dissemination of information technology through educational activities and programs to make use of information systems.

Sample question

**Q22.** Which of the following is the appropriate description of information literacy?

- a) It means the economic disparities between those who have information technology skills and those who do not have them, which arise from computerization such as whether or not one owns a PC.
- b) It means the ability to handle information, or equivalently, to organize, store, and analyze information using a PC as well as collect and transmit information through the Internet and other means.
- c) It means the organizational ability to guide the business organization in developing and implementing an IT strategy and to lead it in the direction in which it should go for the purpose of establishing competitive leadership.
- d) It means the level of availability of information communications devices, software, and information services to all people including handicapped persons and senior citizens.

**Major category 3: System strategy**  
**Middle category 7: System planning**

**22. Computerization planning**

**[Goal]**

- Understand the purpose of computerization planning.

**[Description]**

- ✓ Understand the purpose and process of computerization planning so that you can participate in a study of computerization of your assigned business tasks under the supervisor's guidance.

**(1) Computerization planning**

Understand that computerization planning develops concepts and policies, based on an information systems strategy, analyzes target business tasks, and clarifies the whole image of computerization, such as the order of each system development, approximate cost, and effect.

**Sample terms** schedule, organization, risk analysis, cost effectiveness, scope

**Sample question**

**Q23.** Which of the following is an activity included in systematization planning?

- a) Functional requirements definition
- b) System requirements definition
- c) Software requirements definition
- d) Study of the entire development schedule

**23. Requirements definition**

**[Goal]**

- Understand the purpose of the operational requirements definition based on the analysis of current state.

**[Description]**

- ✓ Understand the purpose of operational requirements definition, analyze assigned business tasks, and check and organize data, so that you can participate in a study of computerization of your assigned business tasks under the supervisor's guidance.

**(1) Operational requirements definition**

Understand that operational requirements definition defines the functions and requirements that the system must provide in consideration of the business strategy, system strategy, and needs of users.

**Sample usage** surveys of user requirements, analysis of surveys, analysis of the current business tasks, definition of operational requirements, definition of functional requirements



Sample question

**Q25.** Which of the following is the item that the ordering company should describe in a request for proposal to clarify the details of transaction contracts for software or services?

- a) Person-days
- b) Basic policy of the system
- c) Program specifications
- d) Estimated cost

# Management

**Major category 4: Development technology**

**Middle category 8: System development technology**

## 25. System development technology

### [Goal]

- Understand the fundamental flow of the process of software development.
- Understand the concepts of the estimate in software development.

### [Description]

- ✓ In order to understand processes through which software is developed, learn the flow of processes, such as requirements definition, system design, programming, and testing, and learn the concepts of an estimate.

### (1) Software development process

Understand what kinds of processes there are in software development.

#### (a) Requirements definition

Understand that the system requirements definition and the software requirements definition, which clarify the functions, performance, and details required for the system and software, are performed.

#### (b) System design

Learn that system design includes systems architecture design, software architecture design, and software detailed design, and understand the fundamental role of each of them. Learn that they are also called external design and internal design.

#### (c) Programming

A program is created according to the system design. Understand that a unit test is performed to verify whether there are any errors (bugs) in each program created.

**Sample terms** white box test, compiler

**Sample usage** creation and analysis of test data

#### (d) Testing

Programs are consolidated after the unit tests are completed and verified whether the software works as specified. Learn that there is a cycle of planning, implementation, and evaluation in a test, and understand that it is necessary to evaluate the gap between target and achievement in testing.

**Sample terms** integration test, system test, operational test, black box test

#### (e) Software acceptance

Understand that, after the ordering company checks whether the software works normally by using it under the same conditions as actual operation and finds it satisfactory, it will be delivered, and training to system users will be provided.

**Sample terms** user manual

#### (f) Software maintenance

Understand that, in software maintenance, in order to support the stable operation of the system, progress of information technology, and change of business strategy, the program is corrected and modified.

**(2) Estimate of software**

Understand the fundamental concepts in estimating the software based on the development scale, development cost, and development environment.

**Sample terms** FP (Function Point) method

**Sample question**

- Q26.** When the information system department performs the procedure of the requirements definition, system design, programming, and testing in the flow of software development, which of the following most needs the participation of the user departments?
- a) Requirements definition                      b) System design  
c) Programming                                      d) Unit test
- Q27.** When the scale of software development is estimated, which of the following is an appropriate element that should be considered?
- a) Developer's skills                                b) Development organization  
c) Number of screens                              d) Schedule
- Q28.** Which of the following shows part of the phases of software development in the order of implementation?
- a) System design, testing, programming  
b) System design, programming, testing  
c) Testing, system design, programming  
d) Programming, system design, testing



## **26. Development process and methods**

### **[Goal]**

- Understand the outline, significance, and purpose of the typical development methods.

### **[Description]**

- ✓ In order to perform software development efficiently, understand the methods and concepts about software development.

### **(1) Major software development methods**

Understand the characteristics of the typical software development methods.

**Sample terms** structured method, object orientation, data oriented approach, process oriented approach

### **(2) Major software development models**

Understand the characteristics of the typical software development models.

**Sample terms** waterfall model, spiral model, prototyping model, RAD (Rapid Application Development)

### **(3) Common frame**

Understand that there is SLCP (Software Life Cycle Process) as the common frame that defines and standardizes the work items used as bases one by one toward seeking for appropriateness of software development and related transactions.

### **Sample question**

**Q29.** Which of the following is the software development model that performs the requirements definition, system design, programming, and testing in that order, and checks carefully so as not to return to the previous phase when each phase is completed?

- a) RAD (Rapid Application Development)
- b) Waterfall model
- c) Spiral model
- d) Prototyping model

## **27. Project management**

### **[Goal]**

- Understand the significance, purpose, and concepts of project management.
- Understand the fundamental flow of the process in project management.

### **[Description]**

- ✓ In order to promote a system development project smoothly, understand the overall fundamental knowledge of project management.

### **(1) Project management**

Understand what project management is and what processes are included.

#### **(a) What is a project?**

Understand the significance and characteristics of a project.

#### **(b) Process in project management**

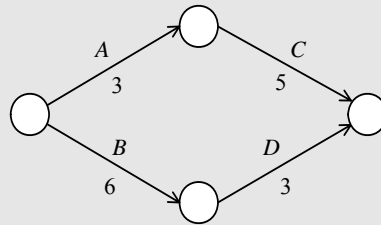
Understand that it is a flow that starts up a project, promotes it based on the plan, controls progress, cost, quality, and human resources through various reviews and achieves the goal.

**Sample terms** project manager, project member, stakeholder, project scope management, WBS (Work Breakdown Structure), arrow diagram, Gantt chart

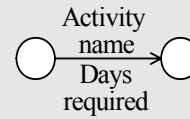
**Sample usage** optimum allocation of human resources in business tasks, schedule management of a project, how to report the progress of business tasks

Sample question

**Q30.** When one day is reduced for Activity *C* and three days are reduced for Activity *B* in the arrow diagram shown below, how many days can be reduced in total?



Legend



- a) 1                      b) 2                      c) 3                      d) 4

**Q31.** Which of the following is described in a project plan?

- a) Screen layout    b) Workflow  
c) Schedule    d) Program structure

**Q32.** It takes 24 days for Mr. *A* to complete a certain software development and 12 days for Mr. *B*. When both Messrs. *A* and *B* work together, 25% of all the working hours in a day are needed for preliminary discussion. When both Messrs. *A* and *B* work together, how many days does it take to complete the development?

- a) 6                      b) 8                      c) 11                      d) 12

## **28. Service management**

### **[Goal]**

- Understand the significance, purpose, and concepts of IT service management.

### **[Description]**

- ✓ Learn that the activities for operating an information system stably and efficiently and maintaining or improving the quality of service to users are required. Learn that IT service management exists as the method of operations management for that purpose, and understand its significance, purpose, and concepts.

#### **(1) IT service management**

Understand that IT service management is the method of the operations management to increase efficiency of IT operation and enhance the quality of services including availability by regarding the business tasks of IT department as IT service and organizing them.

#### **(2) ITIL**

Understand that there is a concept of ITIL (Information Technology Infrastructure Library) as a framework of IT service management.

#### **(3) Service level agreement**

Understand that, in order to stipulate the quality and scope of service to offer and to perform operations management based on the agreement with the service receiver, an SLA (Service Level Agreement) is concluded for the IT service management.

#### **(4) Service level management**

In order to achieve the service level that is agreed between the service receiver and provider, understand that there is SLM (Service Level Management) that aims at maintaining and improving service level through the PDCA cycle.

### **Sample question**

**Q33.** Which of the following is appropriate as an item for evaluating the service level to the user of a system?

- a) The cost concerning the system development
- b) The recovery time from system failure
- c) The number of programs that make up the system
- d) The number of disk input/output

## 29. Service support

### [Goal]

- Understand related items, such as help desk, in service support.

### [Description]

- ✓ In order to understand IT service operation, learn the fundamental role of the service desk (help desk) in the core of service support, and the fundamental configuration of the management functions (roles) included in service support.

#### (1) **Service support**

Understand what kinds of roles and functions service support consists of as a series of activities about daily operations.

**Sample terms** incident management (fault management), problem management, configuration management, change management, release management

#### (2) **Service desk (help desk)**

Understand that a service desk offers a single window to the inquiries from the users of the system, records and manages the inquiries, hands over the inquiries to appropriate departments, and records call-handling results.

### Sample question

**Q34.** Which of the following is responsible for receiving various inquiries, such as operations of the product, solutions at the time of troubles, and complaints from the users of the system?

- a) Access counter
- b) Webmaster
- c) Data center
- d) Help desk

## 30. Facility management

### [Goal]

- Understand the concepts about system environment maintenance.

### [Description]

- ✓ Understand that there is facility management as a concept for a company to maintain system environment at the best state.

#### (1) **System environment maintenance**

Understand the need for the system environment maintenance that maintains the system environment of computers, networks, facilities, and equipment.

**Sample terms** UPS (Uninterruptible power supply), security wire

#### (2) **Facility management**

Understand that, in order for the management to improve resources, such as a building and equipment at their optimum state, there is a concept of facility management.

Sample question

**Q35.** Which of the following is the appropriate description concerning the introduction of an uninterruptible power supply (UPS)?

- a) The highest priority device that should be connected to the UPS is a network printer shared by each PC.
- b) There is a limit in the capacity of the UPS, so the measure to shut down within several minutes after detecting a power failure is required.
- c) The UPS has a power generation function, so it is effective if it connects the computers, lighting, television sets, and other appliances.
- d) The UPS uses a special battery that can be used semi-permanently, so the maintenance cost after introduction is unnecessary.

**Major category 6: Service management**  
**Middle category 12: System audit**

**31. System audit**

**[Goal]**

- Understand the significance, purpose, concepts, and target of system audit.
- Understand the fundamental flow of the process in system audit.

**[Description]**

- ✓ Learn the purpose and main types of audits in a company. In addition, understand the significance, purpose, and fundamental flow about the system audit performed for an information system.

**(1) Audit**

Learn the purpose and types of audits.

**Sample terms** accounting audit, operations audit, information security audit, system audit

**(2) System audit**

Understand the purpose of system audit, and the fundamental flow of the process in system audit.

**(a) Purpose of system audit**

Understand that the purpose of system audit is to investigate the information system from a broad viewpoint and to judge whether the system contributes to management, independently of audited departments.

**(b) Process flow in system audit**

Understand that the process of system audit includes various activities such as overall check of an information system, evaluation, explanation of the result to the management, advice and check for improvement, and follow-up.

**Sample terms** system auditor, system audit standards, system audit planning, preliminary audit, main audit, audit evidence, system audit report

**Sample question**

**Q36.** Which of the following shows the steps of system audit in the order of implementation?

- a) Planning, investigation, report
- b) Cause investigation, correction, test
- c) Design, programming, test
- d) Requirements definition, proposal request, proposal evaluation

## 32. Internal control

### [Goal]

- Understand the purpose and concepts of internal control and IT governance in companies.

### [Description]

- ✓ Learn that internal control and IT governance are provided to realize sound company management, and understand the purpose and concepts.

#### (1) **Internal control**

Understand that internal control is the mechanism of building and running the organization so that the company itself can perform its business in a right and proper way. Understand that clarification of business processes, division of job responsibilities, creation of enforcement rules, and establishment of a check system are necessary for its realization.

#### (2) **IT governance**

Understand that IT governance establishes an information systems strategy and controls its implementation, and that it is required for a company to enhance its competitive power.

### Sample question

**Q37.** Which of the following is included in the internal control for inhibiting an employee's dishonesty?

- a) Publishing the information security plan of a company on the Internet
- b) Assigning separately the operator and approver of a business task
- c) Supporting events as corporate sponsors which are held by cities, towns, and villages for contribution to regional vitalization
- d) Taking the measures against mass media to avoid the deterioration of corporate image by the revealed scandal



# Technology

**Major category 7: Basic theory**  
**Middle category 13: Basic theory**

## 33. Discrete mathematics

### [Goal]

- Understand the fundamental concepts of radixes.
- Understands the fundamental concepts of sets.

### [Description]

- ✓ In order to know fundamental theories about numeric values and data handled by computers, understand the fundamental concepts of the representation and operation of binary numbers, sets, and logical operations.

### (1) **Numbers and representation**

Understand the concepts of the representation of binary numbers, method of radix conversion, representation of negative numbers, and addition and subtraction of binary numbers, as well as the range of numbers that can be represented.

### (2) **Sets**

Understand the fundamental concepts and usage of sets, propositions, Venn diagrams, and truth tables.

### (3) **Logical operations**

Understand the concepts of logical operations, fundamental operations, and the usage of truth tables.

**Sample usage** conditional search using AND, OR, and NOT

### Sample question

**Q38.** Which of the following is the binary number obtained by adding binary number 1111 and binary number 101?

- a) 1111                      b) 1212                      c) 10000                      d) 10100

## 34. Applied mathematics

### [Goal]

- Understand the fundamental concepts of probability and statistics.

### [Description]

- ✓ Understand the fundamental concepts of probability and statistics required for collection, analysis, and processing of data.

**(1) Probability and statistics**

Understand the fundamental concepts of probability and statistics.

(a) The outline of probability

Understand the concepts of permutation, combination, and probability.

(b) The outline of statistics

Understand the concepts of fundamental statistics, such as frequency table, histogram, and average.

**Sample question**

**Q39.** A test consisting of two questions, question 1 and question 2, was given. Among 100 examinees, 65 correctly answered question 1 and 73 correctly answered question 2. At least how many examinees correctly answered both questions?

- a) 35                      b) 38                      c) 62                      d) 65

**35. Theory of information**

**[Goal]**

- Understand the unit of information content.
- Understand the fundamental concepts of digitization of information.

**[Description]**

- ✓ In order to know fundamental theories about numeric values and data handled by computers, understand how to express information content, the concept of digitization, and representation of characters.

**(1) The unit of information content**

Understand the information content such as a bit and a byte and the method of expressing prefixes (K, M, G, T, m,  $\mu$ , n, etc.).

**(2) Digitization**

Understand the fundamental concepts of digitization (A/D conversion), such as quantization, sampling, and encoding, as well as the characteristics of analog and digital.

**(3) Representation of characters**

Understand that characters are represented numerically inside a computer.

**Sample terms**    ASCII code, EUC (Extended Unix Code), JIS code, Unicode

**Sample question**

**Q40.** At least how many bits are required to indicate the length from 0 mm to 1,000 mm in the unit of millimeters?

- a) 4                      b) 10                      c) 1000                      d) 1001

**Major category 7: Basic theory**  
**Middle category 14: Algorithm and programming**

**36. Data structure**

**[Goal]**

- Understand the fundamental concepts of data structures.

**[Description]**

- ✓ Understand the fundamental concepts of data and data structures so that you can perform analysis and arrangement of business data under the supervisor's guidance.

**(1) Data and data structures**

Understand the fundamental concepts of data structures, such as the types of variables and fields, arrays, records, and files. In addition, understand the concepts of lists, queues, and stacks.

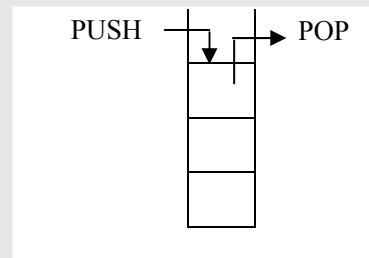
**Sample question**

**Q41.** There is a device where articles are accumulated upwards from the bottom and taken out from upwards in sequential order. There are two kinds of operations for this device.

- PUSH *n*: Accumulate an article (number *n*)
- POP: Extract one article from the top

If no articles are accumulated at the beginning, which of the following is the result of the operations?

PUSH 1 → PUSH 5 → POP → PUSH 7 → PUSH 6 →  
 PUSH 4 → POP → POP → PUSH 3



a) 

1
7
3

b) 

3
4
6

c) 

3
7
1

d) 

6
4
3

**37. Algorithm**

**[Goal]**

- Understand the fundamental concepts and expressions of algorithms and flowcharts.

**[Description]**

- ✓ Understand the fundamental concepts and expressions of algorithms and flowcharts so that you can analyze operations and perform computerization under the supervisor's guidance.

- (1) **Flowchart**  
Understand the symbols in flowcharts, and the expressions of procedures.
- (2) **The basic structure of an algorithm**  
Understand control structures such as sequence, selection, and iteration (or repetition).
- (3) **Fundamental algorithms**  
Understand the total, search, merge, and sort.

#### Sample question

**Q42.** When the procedure described below is repeated to sort five numbers in ascending order, how many times is the procedure repeated until sorting is completed?

[The order of data before sorting]

5, 1, 4, 3, 2

[Procedure]

- (1) If the 1st data > the 2nd data, replace the 1st and 2nd data.
- (2) If the 2nd data > the 3rd data, replace the 2nd and 3rd data.
- (3) If the 3rd data > the 4th data, replace the 3rd and 4th data.
- (4) If the 4th data > the 5th data, replace the 4th and 5th data.
- (5) When no replacement occurs, sorting is completed.

When replacement occurs, repeat the procedure from (1).

- a) 1                      b) 2                      c) 3                      d) 4

### 38. Programming and programming languages

#### [Goal]

- Understand the role of programming languages and programming.

#### [Description]

- ✓ Understand that programming is performed using programming languages in the system development.

- (1) **Programming and programming languages**  
Understand that programming is to describe an algorithm using a programming language, such as C, Java, and COBOL, and that an algorithm can be executed in computers by programming.

#### Sample question

**Q43.** Which of the following is appropriate as the role of a programming language?

- a) It enables humans to read programs automatically generated by computers.
- b) It describes the number of data processed by computers.
- c) It describes the procedures for computers.
- d) It makes an imperfect program written by programmers into a perfect one.

### 39. Other languages

#### [Goal]

- Understand the types and fundamental usage of typical markup languages.

#### [Description]

- ✓ Understand the types and characteristics of the typical markup languages widely used as means of expression in computers. In addition, understand the simple usage (including writing) in using markup languages.

#### (1) **Markup languages**

Understand the characteristics and the fundamental rules in describing typical markup languages, such as HTML (Hyper Text Markup Language) and XML (eXtensible Markup Language).

**Sample terms** tags, SGML

**Sample usage** representation in HTML

#### Sample question

**Q44.** Which of the following is the language used for creating a Web page on the Internet?

- a) BMP                      b) FTP                      c) HTML                      d) URL

**Major category 8: Computer system**  
**Middle category 15: Computer component**

#### 40. Processor

**[Goal]**

- Understand the fundamental configuration and roles of computers.

**[Description]**

- ✓ Understand the fundamental components composing computers, and the concepts of the mechanism, functions, and performance of the processor, which is the core of the computer system.

**(1) The configuration of a computer**

Understand that a computer consists of five fundamental functions and how they are integrated.

**Sample terms** operation, control, storage, input, output

**(2) The fundamental mechanism of a processor**

Understand the concepts of the fundamental mechanism, functions, and performance of a processor.

**Sample terms** operation, control, CPU, clock frequency

**Sample question**

**Q45.** Which of the following is always required so that software can run on a PC?

- a) Keyboard
- b) Network
- c) Printer
- d) Memory

#### 41. Memory

**[Goal]**

- Understand the types and characteristics of memory.
- Understand the types and characteristics of storage media.

**[Description]**

- ✓ Learn that there are various types of computer memory, which have various roles, and understand the types and characteristics of those storage media and the concepts of storage hierarchy.

**(1) Memory**

Understand the characteristics, such as differences of memory capacity and access speed by types of memory.

**Sample terms** RAM, ROM, flash memory, volatility

**(2) Storage media**

Understand the characteristics that vary with the types of storage media, such as storage capacity, portability, usage, and purpose.

**Sample terms** HDD (Hard Disk Drive), CD (CD-ROM, CD-R), DVD (DVD-ROM, DVD-RAM, DVD-R), flash memory (USB memory, SD card)

**(3) Storage hierarchy**

Understand the concepts of storage hierarchy.

**Sample terms** cache memory, main memory, auxiliary memory

Sample question

**Q46.** Which of the following is the memory used in SD cards?

- a) CD-ROM
- b) DRAM
- c) SRAM
- d) Flash memory

## 42. Input/output devices

**[Goal]**

- Understand the types and characteristics of input/output interfaces.

**[Description]**

- ✓ In order to utilize familiar information devices, understand the types and characteristics of input/output interfaces. In addition, understand that device drivers are required to utilize them.

**(1) Input/output interfaces**

Understand the types of input/output interfaces as well as the characteristics of data transfer methods.

**Sample terms** USB, IEEE 1394, Bluetooth, IrDA, PCMCIA, analog, digital, serial, parallel

**(2) Device drivers**

Understand the functions of device drivers and PnP (Plug and Play).

Sample question

**Q47.** Among the connection interfaces for PCs and peripheral devices, which of the following uses electromagnetic waves for the transmission of signals?

- a) Bluetooth
- b) IEEE 1394
- c) IrDA
- d) USB 2.0

**Major category 8: Computer system**  
**Middle category 16: System component**

**43. System configuration**

**[Goal]**

- Understand the fundamental characteristics of system configurations.

**[Description]**

- ✓ Learn that there are various configuration methods in terms of the processing modes and the utilization in system configurations. Understand the examples of typical systems and the fundamental characteristics of the client/server system, one of the distributed processing systems.

**(1) Processing modes**

Understand the characteristics of typical processing modes.

**Sample terms** centralized processing, distributed processing, parallel processing

**(2) System configurations**

Understand the characteristics of typical system configurations.

**Sample terms** dual system, duplex system, thin client

**(3) Utilization**

Understand the characteristics of typical utilization.

**Sample terms** interactive processing, real-time processing, batch processing

**(4) Client/server system**

Understand the fundamental characteristics of a client/server system.

**Sample terms** peer to peer, Web system

**Sample question**

**Q48.** Which of the following is the configuration where the computers connected to the network use resources of each other, such as data, on equal terms?

- a) Client-server
- b) Streaming
- c) Peer-to-peer
- d) Mailing list

**44. System evaluation indexes**

**[Goal]**

- Understand the concepts of the performance, reliability, and economical efficiency of a system.

**[Description]**

- ✓ Understand the evaluation indexes for measuring the performance, reliability, and economical efficiency of a system.

**(1) System performance**

Understand the concepts about the evaluation of system performance.

**Sample terms** response time, benchmark



**(2) System reliability**

Understand the concepts about the evaluation of system reliability.

(a) The indexes showing system reliability

Understand the concepts of typical indexes for indicating reliability.

**Sample terms** availability, MTBF (Mean Time Between Failure), MTTR (Mean Time To Repair)

**Sample usage** study of the availability improvement plan

(b) The design of reliability

Understand the concepts of the typical system configurations and reliable design for improvement in reliability.

**Sample terms** dual system, duplex system, fail safe, fault tolerant, foolproof

**(3) Economical efficiency of a system**

Understand the concepts about evaluation of economical efficiency of a system.

**Sample terms** initial cost, operational cost, TCO (Total Cost of Ownership)

**Sample question**

**Q49.** For improvement in system reliability, there are a measure to prevent failures and a measure to continue operating the system even if a failure occurs. Which of the following is a measure to continue operating the system even if a failure occurs?

- a) Replacing with the devices that do not fail easily
- b) Configure redundant devices that constitute the system
- c) Preparing an operation manual to prevent operators from performing incorrect operations
- d) Performing operations incorporating the scheduled maintenance for the devices

**Major category 8: Computer system**  
**Middle category 17: Software**

**45. Operating system**

**[Goal]**

- Understand the necessity, functions, and types of OSs (Operating Systems).

**[Description]**

- ✓ Understands OSs in terms of management and utilization of computer systems, and understand the characteristics of each of the typical types.

**(1) The necessity for OS**

Understands that an OS has control and management functions so that it can provide hardware and software resources in a computer for users or application software efficiently.

**(2) The functions of OS**

Understand the functions, such as user management (profiles and accounts), file management, input/output management, and resource management.

**Sample usage** management of registration and deletion of user IDs, management of the access privilege of each user

**(3) The types of OSs**

Learn that there are various types of operating systems, such as Windows, Mac OS, UNIX, and Linux. In addition, understand the problems in exchange of data between different types of operating systems.

**Sample question**

**Q50.** Which of the following is the appropriate description concerning an OS that runs on PCs?

- a) Software that manages hardware and applications on a PC
- b) Software for viewing Web pages
- c) Software for transmitting and receiving e-mail
- d) Software for creating and editing documents

**46. File system**

**[Goal]**

- Understand the concepts of file management and use fundamental functions.
- Understand the fundamental concepts of backup.

**[Description]**

- ✓ From a viewpoint of utilizing a system in an office, understand the concepts of file management and how to use fundamental functions. In addition, understand the concepts, such as the necessity for backup and generation management, in preparation for damage of the files by operational errors and system failures.

(1) **File management**

Understand the fundamental mechanism of file management and the access method to files, and perform fundamental handling, such as file sharing and configuring access privileges, in familiar business tasks.

**Sample terms** root directory, current directory

**Sample usage** directory management, file sharing, setup of access privileges, specification of an absolute path and a relative path

(2) **Backup**

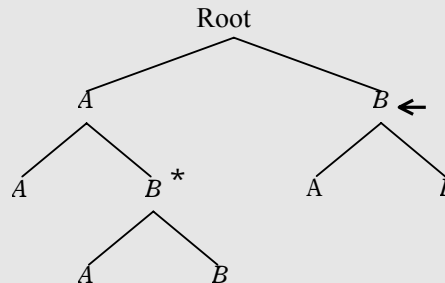
Understand fundamental concepts, such as the necessity, acquisition method, acquisition procedure, and generation management for backups.

**Sample question**

**Q51.** In the hierarchical structure shown in the figure, two or more directories with the same names *A* and *B* are located. Which of the following specifies file “*f*” in the directory indicated by an arrow from the directory with the “\*” (current directory)? Here, the file specification method is as follows:

[Specification method]

- (1) Like “Directory name\ ... \ directory name\file name”, place the directories on the path by using “\” as a delimiter in correct order and then place “\” and the file name.
- (2) Indicate the current directory with “.” (one dot).
- (3) Indicate the parent directory (one level up within hierarchy) with “..” (two dots).
- (4) When it begins with “\”, the root directory is omitted at the left end.



- a) `..B\f`
- b) `..\..B\f`
- c) `..A\..B\f`
- d) `..B\f`

**Q52.** When important files are replicated in preparation for possible hard disk failures, which of the following is the most appropriate method?

- a) Replicating the files on a different hard disk, attaching version numbers to the file names
- b) Finding the available hard disk space for every operation to place replicated files there
- c) Replicating the files with the same file name on the hard disk used for the last replication
- d) Replicating the files with different file names on the same hard disk as that storing them

## 47. Development tools

### [Goal]

- Understand the characteristics and basic operations of software packages, such as office tools.

### [Description]

- ✓ Understand the characteristics of software packages, such as word processing software and spreadsheet software, and understand the fundamental operations for utilizing them in business tasks.

#### (1) **Software packages**

Understand the characteristics of software packages, such as word processing software, spreadsheet software, and a multimedia authoring tool. In addition, install software packages.

#### (2) **Word processing software**

Create documents using the basic functions in word processing software.

**Sample usage** creation of documents and tables, embedding of charts and graphs, effective use of clipboard

#### (3) **Spreadsheet software**

Process data using the basic functions in spreadsheet software.

**Sample usage** cell reference, substitution in cells; specification methods of the four arithmetic operations; utilization of typical functions; selection, addition, deletion, insertion, sorting of data; search, creation of graphs

#### (4) **Presentation software**

Utilize presentation software.

**Sample usage** creation of slides, selection of fonts, creation of figures, embedding of images

#### (5) **WWW browser (Web browser)**

Search for and retrieve necessary information from Web pages using a Web browser.

**Sample usage** utilization of search sites, information retrieval with conditions (AND, OR, NOT)

### Sample question

**Q53.** Which of the following is the purpose of using a multimedia authoring tool?

- a) It is used for creating multimedia content combining materials, such as images, sounds, and characters.
- b) It is used for building the network environment that handles multimedia information, including images, sounds, and characters.
- c) It is used for searching for multimedia information, including images, sounds, and characters on the Internet.
- d) It is used for building the database that consists of multimedia information, including images, sounds, and characters.

## 48. Open source software

### [Goal]

- Understand the characteristics of OSS (Open Source Software).

### [Description]

- ✓ Understand the characteristics, utilization purpose, and considerations in usage of OSS.

#### (1) **Open source software**

Understand the outline of open source software.

##### (a) The characteristics of OSS

Understand that there are the characteristics in OSS, such as disclosure of source codes, prohibition of limit of redistribution, and the principle of no warranty.

##### (b) The types of OSS

Learn that OSS includes various software such as operating systems, communication software (mail clients, WWW browsers), office software (word processing software, spreadsheet software), database management systems, and application software (business application software).

### Sample question

**Q54.** Which of the following is the advantage of using open source software?

- a) It can be used free of charge, including support.
- b) There are no restrictions on modifying the source code.
- c) Security is assured because there are no vulnerabilities in the software.
- d) It can run on every operating system.

**Major category 8: Computer system**  
**Middle category 18: Hardware**

**49. Hardware (computer and I/O device)**

**[Goal]**

- Understand the types and characteristics of computers.
- Understand the types and characteristics of I/O devices.

**[Description]**

- ✓ Understand the types and characteristics about typical hardware, such as computers including PCs and I/O devices including a keyboard, a mouse, a display, and a printer, which make up an information system.

**(1) Computer**

Understand the types and characteristics of typical computers.

**Sample terms** PC, server, general purpose computer, PDA (Personal Digital Assistant)

**(2) I/O device**

Understand the types and characteristics of typical I/O devices.

**Sample terms** keyboard, mouse, tablet, image scanner, touch panel, bar code reader, display, printer

**Sample question**

**Q55.** Which of the following is the input device that detects the moving direction and distance and reflects it on the cursor movement on the screen?

- a) Keyboard
- b) Touch panel
- c) Bar code reader
- d) Mouse

**Major category 9: Technology element**  
**Middle category 19: Human interface**

**50. Human interface technology**

**[Goal]**

- Understand the characteristics of human interfaces.

**[Description]**

- ✓ Understand the characteristics of human interfaces and the characteristics of each component of GUI, which is the typical human interface.

**(1) Human interface**

Understand that a human interface is an interface between users and systems used in various situations.

**(2) GUI**

Understand the characteristics of GUI (Graphical User Interface), such as the visual display using various graphics and the intuitive operations by a pointing device and other devices.

**Sample terms** window, icon, radio button, check box, list box, help function, menu bar, pull-down menu, pop-up menu

**Sample question**

**Q56.** Which of the following is the appropriate GUI (Graphical User Interface) component used to select one from multiple alternatives?

- a) Scroll bar
- b) Push button
- c) Progress bar
- d) Radio button

**51. Interface design**

**[Goal]**

- Understand the concepts of interface design.

**[Description]**

- ✓ Understand that the interface used as the contact point between users and systems has a great effect on ease of use and understanding a lot, and understand the concepts of desirable interfaces.

**(1) Screen and form design**

Understand the concepts of designing the screens and forms in software.

**(a) Screen design**

Understand the concepts of design of screens with good operability, such as smooth input flow, establishing the rules in using colors, and displaying the operation guide.

**(b) Form design**

Understand the concepts of an appropriate form design, such as placing relevant items nearby, including only minimum necessary information, and deciding the rules to unify forms.

**(2) Web design**

Understand that the viewpoint of usability (ease of use) is required in Web design, such as giving uniformity to the color tone and design in the whole site by using style sheets, and supporting a variety of WWW browsers.

**(3) Universal design**

Understand the concepts of universal design, which enables as many people as possible to use comfortably irrespective of age, culture, and handicaps or ability differences.

**Sample question**

**Q57.** When Web pages are created with due consideration for ease of use, which of the following points should be kept in mind?

- a) The fundamental screen structure and buttons should be displayed and placed in an easily understood manner on each page, without unifying the whole website.
- b) When there are many options, they should be divided into groups or hierarchies to make them easy to select.
- c) The title of a page should be named so that the developer can understand easily when the page contents are updated.
- d) When you want the user to move to another page, you should make the page switch automatically, rather than prompt the user to select the link for the destination.



## **52. Multimedia technology**

### **[Goal]**

- Understand the types and characteristics of encodings of sounds and images.
- Understand the characteristics of compression and decompression of information.

### **[Description]**

- ✓ Understand that information, including characters, sounds, and images, can be handled in computers in an integrated manner by means of multimedia technology. In addition, understand the characteristics of typical file formats for multimedia, and information compression and decompression.

### **(1) Multimedia**

Understand that multimedia digitizes (encodes) the various forms of analog information, such as sound and image (static image and video), as well as text, and handles them in an integrated manner on computers.

**Sample terms** Web contents, hypermedia, streaming

### **(2) File formats for multimedia**

Understand the characteristics of the main file formats used in sound processing, static image processing, and video processing.

**Sample terms** MP3 (MPEG Audio Layer-3), MIDI (Musical Instrument Digital Interface), JPEG (Joint Photographic Experts Group), GIF (Graphics Interchange Format), PNG (Portable Network Graphics), MPEG (Moving Picture Experts Group), PDF (Portable Document Format)

### **(3) Compression and decompression of information**

Understand that the compression/decompression methods are used for large sound, image, and video data according to the types of media. In addition, understand that the purpose of compression includes the reduction of data storage and network load.

**Sample terms** JPEG, MPEG, ZIP, LZH, compression ratio, lossless compression, lossy compression

### **Sample question**

**Q58.** Which of the following is the appropriate description concerning the JPEG format?

- a) It is an encoding format for images with up to 256 colors.
- b) It is an encoding format for audio.
- c) It is an encoding format for static images.
- d) It is an encoding format for videos.

### 53. Multimedia application

#### [Goal]

- Understand the purpose and characteristics of multimedia application.

#### [Description]

- ✓ Understand the characteristics of graphics processing, and learn that CG (Computer Graphics) and VR (Virtual Reality) are included in the application areas of multimedia technology.

#### (1) **Graphics processing**

Understand the characteristics of colors, image quality, and drawing tools in graphics processing.

##### (a) Representation of colors

Understand that colors are represented by the additive primaries (RGB) and the subtractive primaries (CMY) in computers. In addition, learn that colors are represented with hue, lightness, and saturation.

##### (b) Image quality

Understand pixels, resolution, and gray scale.

##### (c) Graphics software

Understand the characteristics of painting software and drawing software.

#### (2) **Multimedia application**

Learn the examples of typical application areas of multimedia technology.

**Sample terms** CG (Computer Graphics), VR (Virtual Reality), CAD, simulator, game

#### Sample question

**Q59.** Which of the following is the appropriate explanation of virtual reality?

- a) It enables recognition of the overall picture immediately not by displaying an image from the top gradually but by displaying a coarse mosaic-like image first and then displaying a clear and vivid image gradually.
- b) It enables seeing and hearing the objects and spaces that are generated by computers like the actual world using computer graphics etc.
- c) Instead of the wind tunnel test used for the design of cars and airplanes, it conducts simulation tests using computers.
- d) It creates the composite image of scenery and people shot separately to make an image that is different from the real world.

## 54. Database architecture

### [Goal]

- Understand the significance, purpose, and concepts of database and DBMS (Database Management System).

### [Description]

- ✓ Note that a database is an important means for representing business tasks in terms of information (data), and that a database management system stores data structurally, maintains consistency, and is equipped with the functions for extracting it efficiently. In addition, understand the significance, purpose, and concepts of database.

#### (1) **Database**

Understand the purpose and characteristics of database and the concepts of the database model.

#### (2) **Database management system**

Understand the significance, purpose, and concepts of a DBMS (Database Management System) from a viewpoint of usage in familiar business tasks.

### Sample question

**Q60.** Which of the following is appropriate as a role that a database management system plays?

- a) It compresses data to increase the available capacity of a disk.
- b) It encrypts the data transmitted to a network.
- c) It enables multiple computers to share a magnetic disk.
- d) It enables multiple users to share a large amount of data.

## 55. Database design

### [Goal]

- Understand the concepts of analysis and design for data.

### [Description]

- ✓ Understand the necessity of analysis and design for data and its fundamental process.

#### (1) **Data analysis**

Understand the necessity of checking up and organizing the data used in business tasks.

#### (2) **Data design**

Organize and represent the data and the relations of data.

**Sample terms** E-R diagram, field (item), record, file, table, primary key

**Sample usage** arrangement and optimization of business data

#### (3) **Data normalization**

Understand the necessity of data normalization. However, the details of normalization are not on the test.

Sample question

**Q61.** In handling a database, the key to specify a record is required. Which of the following is the appropriate key to specify a record in the student management table of a certain school year?

- a) Name
- b) Address
- c) Student number
- d) Birth date

**56. Data manipulation**

**[Goal]**

- Understand the operations such as data extraction.

**[Description]**

- ✓ Understand data manipulation required to utilize relational databases.

**(1) Data manipulation**

Understand the typical data manipulation methods about a table. However, the syntax of SQL is not on the test.

**Sample usage** selection, insertion, update, projection, and joint operations using business data

Sample question

**Q62.** Which of the following is the membership number of the woman whose present address and work location are both Tokyo in the member list table?

Member list

Membership number	Name	Sex	Present address	Work location
0001	Akio Tanizawa	Male	Saitama Prefecture	Tokyo
0002	Masato Toyonaga	Male	Tokyo	Tokyo
0003	Mayumi Akiyama	Female	Chiba Prefecture	Saitama Prefecture
0004	Yuka Kasai	Female	Tokyo	Tokyo
0005	Kenta Yamauchi	Male	Saitama Prefecture	Saitama Prefecture
0006	Nobuko Yamamoto	Female	Chiba Prefecture	Tokyo

- a) 0001
- b) 0003
- c) 0004
- d) 0006

## 57. Transaction processing

### [Goal]

- Understand the processing methods of database.

### [Description]

- ✓ Understand that it is necessary to maintain the consistency of a database under the exclusive control and recovery functions, in preparation of inquiring and updating data by multiple users.

### (1) **The functions of a database management system**

About the exclusive control and the recovery functions required to achieve information sharing and data integrity, understand the necessity and outline of the functions using familiar examples.

### Sample question

**Q63.** Which of the following is the problem that may occur when multiple users change one file and overwrite it concurrently?

- a) Many files with the same name are created and the users cannot distinguish them.
- b) Only the contents overwritten by the last user remain, and the previous modifications are lost.
- c) The file is moved onto the PC of the user who modified the file previously, and other users cannot find the file.
- d) Modified contents are automatically added at the end of the file and the file size increases.

**Major category 9: Technology element**  
**Middle category 22: Network**

**58. Network architecture**

**[Goal]**

- Understand the classification of LAN and WAN regarding networks.
- Understand the roles of the connecting devices for building a network.

**[Description]**

- ✓ Recognize that a network is an indispensable infrastructure for corporate activities, and understand the outline of the roles of LAN and WAN, which make up a network, and typical network components. Configure familiar in-company LAN under the supervisor's guidance.

**(1) Network configuration**

Learn that the network in a familiar workplace consists of LAN and WAN, and understand the meaning of each.

**(2) Network component**

Understand the architecture of typical networks, such as Ethernet, and the role of the lines and the connecting devices that make up a network.

**Sample terms** network interface card, cable, hub, router, switch, modem, terminal adapter, communication line, transmission path, wireless LAN, default gateway

**Sample usage** configuration of in-company LAN under the supervisor's guidance

**Sample question**

**Q64.** Which of the following is the appropriate explanation of LAN?

- a) The protocol for transmitting and receiving e-mails on the Internet
- b) The network that provides high speed communication between the computers in a comparatively narrow area, such as inside of the same building
- c) The network that connects geographically distant Base A and Base B using telephone lines or dedicated lines to provide communication
- d) The standard protocol of the Internet used for network control

**59. Communications protocol**

**[Goal]**

- Understand the necessity for communication protocols.
- Understand the roles of the typical familiar protocols.

**[Description]**

- ✓ Understand that, to communicate between different system environments, a communication protocol is required, and understand the roles of the typical protocols used on the Internet.

**(1) Communication protocol**

Learn that it is necessary to perform transmission in accordance with common rules to deliver information between the sender and the receiver.

**Sample terms** TCP/IP, HTTP, HTTPS, SMTP, POP, FTP, port number

### Sample question

**Q65.** What is the convention and rules that both sides should observe about error detection, retransmission control, and selection of communication pathways for data flowing through channels, in communication between computers via a network?

- a) Address
- b) Interface
- c) Domain
- d) Protocol

## 60. Network application

### [Goal]

- Understand the fundamental mechanism of the Internet and the characteristics of the services.
- Understand the characteristics of communication services and transmission speed.

### [Description]

- ✓ Understand the fundamental mechanism of the Internet and learn the characteristics of services on the Internet, such as e-mail. Understand the characteristics of communication services that provide means of communications such as the Internet.

#### (1) The mechanism of the Internet

Understand that the computer connected to the Internet is managed by a unique IP address and domain name.

**Sample terms** IP address, domain name, DNS, URL, transmission speed (bps: bits per second)

#### (2) Internet service

Understand the characteristics of various services used on the Internet, such as e-mail, Web, and file transfer, and the key points to consider about their utilization.

**Sample terms** broadcast mail, mailing list, mailbox, cc, bcc

#### (3) Communication service

Understand the outline of communication service.

**Sample terms** carrier, ISP (Internet Service Provider), packet communication, mobile communication, IP telephone, ADSL, optical communication

**Sample usage** the concepts of packet communication, the concepts of charging by the metered rate system and flat rate system

### Sample question

**Q66.** When Mr. A sent an e-mail to Mr. B, Mr. A specified Mr. C as “cc” and Mr. D and Mr. E as “bcc.” Which of the following is an appropriate explanation at that time?

- a) Mr. B understands that the mail from Mr. A was sent to Mr. D and Mr. E.
- b) Mr. C understands that the mail from Mr. A was sent to Mr. D and Mr. E.
- c) Mr. D understands that the mail from Mr. A was sent to Mr. E.
- d) Mr. E understands that the mail from Mr. A was sent to Mr. C.

**Q67.** When you send broadcast mails to a large number of predetermined people, which of the following is used to specify the destinations easily?

- a) bcc
- b) Mailing list
- c) Mail transfer
- d) Mailbox

## 61. Information security

### [Goal]

- Understand the fundamentals of information security from the viewpoint of safe activities in a network society.

### [Description]

- ✓ Understand that information security is required to collect and utilize information safely. In addition, understand what types of threats and vulnerabilities to information security exist.

#### (1) **The concepts of information security**

Understand the fundamental concepts and the purpose of information security.

#### (2) **Information assets**

Learn that there are customer information, sales information, intellectual property related information, and personnel information as typical types of information assets in a company.

#### (3) **Threat and vulnerability**

Understand the types of typical threats to information security, and the fundamental ways of coping with them. In addition, understand the vulnerability, which is a factor that may cause security incidents or accidents.

##### (a) The types and the characteristics of human threats

Understand the types and characteristics of typical human threats.

**Sample terms** leakage, loss, damage, peep, spoofing, cracking, social engineering, operational error

**Sample usage** management of information based on information security policies

##### (b) The types and characteristics of technical threats

Understand the types and characteristics of typical technical threats.

**Sample terms** malware (computer virus, BOT, spyware), phishing, cross site scripting, file sharing software, DoS (Denial of Service) attack, security hole

##### (c) The types and characteristics of physical threats

Understand the types and characteristics of typical physical threats.

**Sample terms** disaster, destruction, sabotage

### Sample question

**Q68.** Which of the following describes social engineering?

- a) It collects a user's personal information via a questionnaire on a website.
- b) It analyzes the utilization history of on-line shopping to predict the product that the customer is likely to buy.
- c) It collects the e-mail addresses publicly available on the website to transmit the e-mails for advertisements to many people.
- d) It picks a piece of paper on which a password is written out of a trash can to obtain a user's password, and pretend to be the user when using a system.



## 62. Information security management

### [Goal]

- Understand the fundamental concepts about information security management.

### [Description]

- ✓ Understand the necessity for risk management. In addition, as part of that, understand the purpose and the fundamental concepts of information security management, as well as protection of personal information.

#### (1) Risk management

Understand that risk management is performed in a flow of the identification, analysis, evaluation, and countermeasure of a risk, and that maintenance of manuals and preparations such as education and training are needed to cope with an incident or accident.

#### (2) Information security management

Understand the necessity for information security management, and the concepts of ISMS (Information Security Management System).

**Sample terms** information security policy, three major elements of information security management (confidentiality, integrity, availability)

#### (3) Protection of personal information

Understand the necessity for protection of personal information and the purpose of measures, such as relevant laws and the Privacy Mark System.

### Sample question

**Q69.** Which of the following is the appropriate description concerning formulation of the information security policies in a company?

- a) They are common in each type of industry, so creating original policies in each company is not required.
- b) They are created by a system administrator and care must be taken not to let anyone else know about them.
- c) The concepts and measures for information security in the company are clearly described in a document.
- d) The configuration of a firewall is determined and documented.

**Q70.** Which of the following is the most appropriate description concerning management of the user IDs and passwords in system operations?

- a) Each business system uses a different user ID and password. The user must carry a list to prevent input mistakes.
- b) The company prompts all the employees to change their passwords periodically, and the users themselves change their passwords.
- c) A system distributes the word chosen from the dictionary at random to each user. The user uses it for a password up to a periodic date of update.
- d) The users are encouraged to use a numeric string that is easy to memorize and easy to use, such as their birthdays and telephone numbers, as their passwords.

## 63. Information security measures and information security implementation technology

### [Goal]

- Understand the fundamental concepts of the measures for information security, and take minimum necessary measures.
- Understand the roles of technologies, such as authentication, access control, and encryption required to maintain information security.

### [Description]

- ✓ To take minimum necessary measures appropriately against various threats to information security, understand and take fundamental measures in terms of human, technical, and physical securities.

### (1) **The types of information security measures**

Understand the fundamental concepts of human, technical, and physical securities as measures for information security and the security measures that should be implemented at the very least.

#### (a) The types of human security measures

Understand the types of human security measures and apply fundamental measures in familiar business tasks.

**Sample terms** information security policy, access privilege

**Sample usage** the education and training about information security; observance of information security policies, internal rules, and manuals; access controls such as setup of an access privilege

#### (b) The types of technical security measures

Understand the types of technical security measures and apply fundamental measures in familiar business tasks.

**Sample terms** encryption, ID, password, content filter, callback, access control, firewall, DMZ (DeMilitarized Zone), SSL (Secure Sockets Layer), digital signature

**Sample usage** installation of antivirus software, the update of virus definition files, security setup of an e-mail and a web browser, OS update

#### (c) The types of physical security measures

Understand the types of physical security measures, and act according to the rules in the organization.

**Sample terms** biometric authentication, surveillance camera, locking management, entrance access control

**Sample usage** entrance access control using ID cards

### (2) **Encryption technology**

Understand the fundamental mechanism and characteristics of encryption technology required to maintain information security.

**Sample terms** common key cryptography, public key cryptography, encryption, decryption

### Sample question

**Q71.** Which of the following is the appropriate description of measures against computer viruses?

- a) Virus checking is unnecessary while the PC is operating normally.
- b) The virus definition file in antivirus software is updated to the latest one.
- c) Virus checking is unnecessary if the digital signature is attached to the program.
- d) Virus checking is unnecessary for the software that one of your friends gave you.

## ■ Answers to sample questions

Question No.	Answer
Q1	c
Q2	c
Q3	c
Q4	c
Q5	b
Q6	d
Q7	c
Q8	c
Q9	b
Q10	b
Q11	a
Q12	d
Q13	b
Q14	b
Q15	c
Q16	d
Q17	d
Q18	c
Q19	c
Q20	a
Q21	b
Q22	b
Q23	d
Q24	d
Q25	b

Question No.	Answer
Q26	a
Q27	c
Q28	b
Q29	b
Q30	b
Q31	c
Q32	c
Q33	b
Q34	d
Q35	b
Q36	a
Q37	b
Q38	d
Q39	b
Q40	b
Q41	c
Q42	d
Q43	c
Q44	c
Q45	d
Q46	d
Q47	a
Q48	c
Q49	b
Q50	a

Question No.	Answer
Q51	b
Q52	a
Q53	a
Q54	b
Q55	d
Q56	d
Q57	b
Q58	c
Q59	b
Q60	d
Q61	c
Q62	c
Q63	b
Q64	b
Q65	d
Q66	d
Q67	b
Q68	d
Q69	c
Q70	b
Q71	b

**Information Technology Engineers Examination**  
**— IT Passport Examination (Level 1) —**  
**Syllabus (Version 1.1)**

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