



October 2012

IT Passport Examination

Questions must be answered in accordance with the following:

Question Nos.	Q1 – Q100
Question Selection	All questions are compulsory.
Examination Time	9:30 – 12:15 (165 minutes)

Instructions:

1. Use a pencil. If you need to change an answer, erase your previous answer completely and neatly. Wipe away any eraser debris.
2. Mark your examinee information and your answers in accordance with the instructions below. Your answer will not be graded if you do not mark properly. Do not mark nor write on the answer sheet outside of the prescribed places.
 - (1) **Examinee Number**
Write your examinee number in the space provided, and mark the appropriate space below each digit.
 - (2) **Date of Birth**
Write your date of birth (in numbers) exactly as it is printed on your examination admission card, and mark the appropriate space below each digit.
 - (3) **Answers**
Select one answer (a through d) for each question.
Mark your answers as shown in the following sample question.

[Sample Question]

Q1. In which month is the autumn IT Passport Examination conducted?

- a) September b) October c) November d) December

Since the correct answer is “b)” (October), mark your answer sheet as follows:

[Sample Answer]

Q1	<input type="radio"/> a	<input checked="" type="radio"/> b	<input type="radio"/> c	<input type="radio"/> d
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**Do not open the exam booklet until instructed to do so.
Inquiries about the exam questions will not be answered.**

Company names and product names appearing in the examination questions are trademarks or registered trademarks of their respective companies. Note that the symbols ® and ™ are not used within.

Answer questions Q1 through Q36 concerning technology.

Q1. When three balls are picked out consecutively from a box containing three white balls and four black balls, which of the following is the lowest probability?

- a) Probability of picking out the balls in order of black, black, black
- b) Probability of picking out the balls in order of black, black, white
- c) Probability of picking out the balls in order of black, white, black
- d) Probability of picking out the balls in order of white, black, black

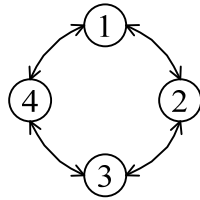
Q2. As shown in the figure below, decimal numbers 2, 5, 10, and 21 are represented using five squares that are black or white.

2	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
5	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
10	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
21	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>

A white square indicates 0, and a black square indicates a different positive value that is determined depending on the position of the square. When the sum total of the values of the five squares shows a decimal number, which of the following is the numeric value that is represented by ☒☒☐☐☐.

- a) 12
- b) 20
- c) 24
- d) 30

- Q3.** There exist four states numbered 1 through 4. The four states are connected as shown in the figure below, and the state transition occurs in a clockwise or counter-clockwise direction.



If the current state is 1, which of the following is the state that is reached after the procedure below is performed twice?

[Procedure]

The number of the current state is multiplied by 11, and the result is divided by 3. The process below is performed based on the remainder of the division.

- When the remainder is 0, a transition to the next state occurs in the clockwise direction.
- When the remainder is 1, a transition to the next state occurs in the counter-clockwise direction.
- When the remainder is 2, a transition to the second state occurs in the clockwise direction.

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

Q4. When HTML is used to describe a Web page, which of the following is an appropriate point to be noted?

- a) HTML and browser specifications are standardized for each PC manufacturer. Therefore, in order to display a Web page correctly, it is necessary to describe it for each type of PC.
- b) Even if the HTML description is the same, a Web page may be displayed differently depending on the browser used. Therefore, when a Web page is described, it is necessary to confirm how it is displayed by each browser.
- c) HTML is standardized for each browser used. Therefore, in order to display a Web page correctly, it is necessary to describe it for each browser.
- d) HTML descriptions including sound and video differ depending on the browser. Therefore, in order to support all browsers, it is necessary to describe a Web page using only characters and still images.

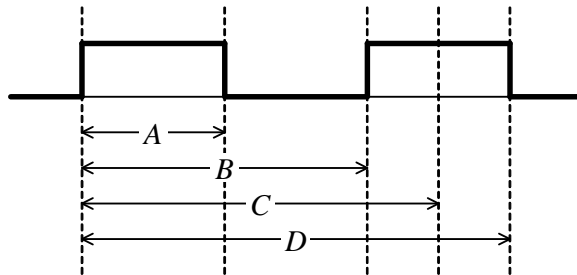
Q5. Which of the following is an appropriate explanation of Java?

- a) It is an interpreter-type object-oriented language developed in the 1970s and includes an integrated development environment with editor and debugger as well as OS functions.
- b) It incorporates object-oriented concepts, such as class and inheritance, into the programming language C, and has upper compatibility with C.
- c) It is a markup language used on the Web and describes the document structure by using tags. It enables the creation of hypertext that links text, movies, etc.
- d) It is an object-oriented language, and source code is compiled into a format called bytecode that can be executed on a JVM (Java Virtual Machine).

Q6. Which of the following is the markup language that easily enables transaction data to be issued as vouchers as-is or converted into in-house documents in business-to-business transactions using the Internet?

- a) HTML
- b) SGML
- c) UML
- d) XML

- Q7.** “CPU clock frequency: 1 GHz” is described in a PC catalog. This indicates that a CPU runs with a signal of one billion (i.e., 10^9) cycles per second. Which of the following shows one cycle of a square wave?



- a) A b) B c) C d) D
- Q8.** When a streamer is used at a data transfer rate of 500 KB/sec, how many minutes are needed to back up 1 GB of data?
- a) 2 b) 3 c) 20 d) 33
- Q9.** Which of the following is a standard for the interface of a wireless connection such as a wireless link between a PC and peripheral devices?
- a) Bluetooth b) IEEE 1394
c) PCI d) USB 3.0
- Q10.** When a peripheral device is connected to a PC, which of the following is the function that is used to automatically install and configure the corresponding device driver into the system?
- a) Auto-complete b) Slot-in
c) Plug-and-play d) Plug-in

Q11. Which of the following is an appropriate characteristic of RAID 1 (mirroring)?

- a) The availability of data is increased by simultaneously writing the same data into two or more hard disks.
- b) Two or more hard disks are connected together as a single virtual hard disk drive that has the total capacity of those disks.
- c) By dividing data into multiple pieces and writing them into two or more hard disks in parallel, the writing speed is increased.
- d) By writing the divided data and the parity information for error corrections into three or more hard disks, the availability of data and the writing speed are increased.

Q12. Among RASIS (Reliability, Availability, Serviceability, Integrity, and Security), which of the following is an explanation of availability?

- a) Effectively determining, diagnosing, and repairing problems in a computer system
- b) Calculating the average repair time of a computer system
- c) Maintaining a computer system so that it is ready for use at any time
- d) Taking preventive measures so that a computer system is not damaged or data is not stolen by unauthorized access

Q13. Which of the following is an appropriate description concerning the hardware maintenance of a system?

- a) The hardware device that has not failed for a certain period of time is excluded from the coverage of scheduled maintenance.
- b) It is safe to replace the failed hardware device with the latest model rather than the same model, because compatibility is guaranteed.
- c) Scheduled maintenance is performed for the hardware device that has failed before.
- d) In preventive maintenance, measures are taken before a failure occurs.

Q14. Which of the following is a small application program that is automatically downloaded along with a Web page in response to a client request and is executed on a Web browser?

- a) Applet
- b) Servlet
- c) Script
- d) Thread

Q15. There exists a system that controls access to personnel files by using the attributes of each individual and the group to which the individual belongs. When the attributes for the personnel department and its four members meet the conditions below, which of the following is an appropriate combination that shows the number of members who can read the files and the number of members who can update the files?

[Conditions]

- (1) The attribute information is represented using 3 bits.
- (2) Each bit represents “read”, “update”, and “insert/delete” permission, from left to right. “1” indicates that permission is granted, and “0” indicates that permission is denied.
- (3) The group attribute is applied to an individual only if the individual’s attribute is not registered.
- (4) The group’s and individual’s attributes are registered as shown below.

Personnel department group: 110

Mr. A: 100 Mr. B: 110 Mr. C: 001 Mr. D: not registered

	Number of members who can read the files	Number of members who can update the files
a)	2	1
b)	2	2
c)	3	1
d)	3	2

Q16. Which of the following is an appropriate description concerning the data format of CSV?

- a) It can record not only text and numerical data but also expressions and format information. A tab is used as a delimiter between data.
- b) It records text and numerical data as well as other information that consists of only several types of control characters including a newline character. A space, a colon, or a semicolon is used as a delimiter between data.
- c) It uses a comma as a delimiter between text and/or numerical data, and a new line character as a delimiter between records. Text data is often enclosed by quotation marks.
- d) It can record not only text data but also other data such as images and Java applets. A command called a tag is often inserted between data entries.

Q17. Which of the following is a system that provides an environment to promote working partnerships and to support joint activities among the members of an organization?

- a) Groupware
- b) Group dynamics
- c) Collaboration
- d) Workflow

Q18. Which of the following is an appropriate description concerning the use of OSS (Open Source Software)?

- a) OSS users have an obligation to pay the developer the fee for the software.
- b) OSS users are allowed neither to sell the OSS nor to distribute it at no fee.
- c) OSS cannot be used in the field of genetic research.
- d) Software derived from the published OSS can be made available as OSS.

Q19. If data is repeatedly added to and deleted from a hard disk on a PC, data may not be stored in consecutive areas on the hard disk. When no measures are taken, which of the following is a phenomenon that can occur?

- a) Viruses cannot be detected.
- b) Data cannot be written correctly.
- c) Data cannot be read correctly.
- d) Stored data cannot be read quickly.

Q20. Which of the following is a mechanism that allows a user to have access to several permitted servers and applications once the user is authenticated?

- a) Single sign-on
- b) Smart card
- c) Biometric authentication
- d) One-time password

Q21. Which of the following is a purpose of using a database management system?

- a) To enable users to access data even when there is no OS available
- b) To eliminate the need for backups created in preparation for disk failures
- c) To encrypt data to be transmitted over a network
- d) To enable multiple users to share information while maintaining data integrity

Q22. The response time of an inventory management system that uses a relational database has recently become slow. An investigation reveals that when the system was initially created, there was no problem with response time, and after that, addition and deletion of product data was repeatedly performed on the database. Which of the following is the most effective way to improve the response time of the database?

- a) Upgrading the CPU of the database server
- b) Extending the index area of the database
- c) Defragmenting the database
- d) Increasing the number of hard disks that store the database

- Q23.** There exist two tables Airport and Schedule as shown below. Which of the following is the available flight that departs from Airport *F* and arrives at Airport *K* at the earliest time?

Airport

Airport code	Airport name
A0001	Airport <i>T</i>
A0002	Airport <i>K</i>
A0003	Airport <i>F</i>

Schedule

Flight	Departure airport code	Arrival airport code	Departure time	Arrival time	Reservation status
IPA101	A0003	A0002	12:10	13:05	Full
IPA201	A0003	A0001	12:15	13:35	Available
IPA301	A0003	A0002	12:45	13:40	Available
IPA401	A0002	A0003	13:05	13:55	Available
IPA501	A0003	A0002	13:40	14:35	Available
IPA601	A0001	A0003	12:40	14:00	Full

- a) IPA101 b) IPA201 c) IPA301 d) IPA501

Q24. In the description below concerning the transaction processing of a database, which of the following is an appropriate combination of terms to be inserted into blanks *A* and *B*?

When multiple users attempt to update the same data simultaneously, a mechanism for temporarily limiting access to the data in order to maintain its integrity is called *A*. One method for implementing this mechanism is to place a *B* on data before it is updated and to prevent other users from accessing the same data until the process is completed.

	<i>A</i>	<i>B</i>
a)	routing control	deadlock
b)	routing control	lock
c)	exclusive control	deadlock
d)	exclusive control	lock

Q25. Which of the following is the most appropriate description concerning a VPN that is used to connect a PC to a network installed in the workplace from outside via the Internet?

- a) It provides several lines for connecting to the Internet and improves availability.
- b) It guarantees the maximum delay time by controlling the timing of transmission.
- c) It guarantees a minimum bandwidth by compressing the communication data.
- d) It performs highly secure communications by using authentication and encryption of the communication data.

Q26. Which of the following is the unit that represents the data transmission speed in a network?

- a) bps
- b) fps
- c) ppm
- d) rpm

Q27. Which of the following is an appropriate description concerning protocols?

- a) HTML is a protocol for sending and receiving Web data.
- b) HTTP is a protocol for monitoring a network.
- c) POP is a protocol for operating a computer located at a remote site.
- d) SMTP is a protocol for sending e-mail.

Q28. In the Internet, IPv6 is coming into use in addition to IPv4 that has been used as a communications protocol. Which of the following is an appropriate explanation of IPv6?

- a) An IPv6 network cannot coexist with the IPv4 network and therefore needs to be constructed as an independent network.
- b) The bit length of an IP address is four times as long as that of IPv4, and the risk of IP address exhaustion can be avoided.
- c) An IP address consists of character strings that are a host name and a domain name, not numeric values.
- d) A cryptography communications function is not supported, and encryption and decryption are performed by a higher level protocol.

Q29. Which of the following is an appropriate measure to avoid a shortage of total mailbox capacity in the mail server?

- a) Setting an upper limit for each user's mailbox capacity
- b) Implementing mirrored disks on the mail server
- c) Making a backup copy of the mail data
- d) Sending large e-mails all at once during hours when they do not adversely affect the transmission of other e-mails

Q30. Which of the following is an appropriate explanation of the keylogger that is a threat to information security?

- a) Stealing information by watching the keyboard input and the display screen from behind a PC user
- b) Monitoring the keyboard input on a user's PC by running a mechanism that can record such input
- c) Analyzing a password by using dictionary data that contains words likely to be used as a password
- d) Searching for a free access point by moving around a town with a PC that can detect the electromagnetic waves of a wireless LAN

Q31. Which of the following is an appropriate explanation of an information security policy?

- a) Once an information security policy is established, it should not be changed even when the business environment or technology makes any changes.
- b) The approach to organizational activities concerning information security is shown and published after the management approval of the organization.
- c) Stockholders and the general public are widely informed of activities to be emphasized for the expansion of a security business.
- d) Specific security policies are described based on the security concepts of the organization.

Q32. Which of the following is the most appropriate explanation of phishing?

- a) A computer infected with a virus is operated illegally from an external location via a network such as the Internet by using the functions of the virus.
- b) A false e-mail is sent, in order to lead the recipient to a fictitious Web site or to a fake of an existing Web site, and then to illegally obtain personal information.
- c) When user's data entered in a Web page is displayed as is, a malicious script is embedded in the page in order to illegally obtain the information about another user who accesses the page.
- d) A resident program is placed on a PC without the knowledge of the users in order to illegally obtain data in files or information about PC operations.

Q33. Which of the following is an appropriate explanation of “availability” in information security?

- a) The system operation and output results are as intended.
- b) The information is accurate and is not falsified or destroyed.
- c) A permitted user can access information when needed.
- d) No information is disclosed to a process that is not permitted.

Q34. Which of the following is an appropriate concept concerning the information security policy?

- a) The cost of measures should preferably be the same for all types of information assets.
- b) The information security policy, which is the top-level component of the ISMS (Information Security Management System) policy, should be disclosed only to top management and other executives.
- c) The information security policy should be applied to all employees including part-time workers and full-time employees.
- d) When an information security policy is created for the first time, it is desirable to use a similar policy of another company in the same industry as a sample and adopt as much of that policy as possible without change.

Q35. Which of the following is the most appropriate description concerning SSL?

- a) It generates a one-time password to authenticate a user on a Web site.
- b) It encrypts all communications between a Web server and a browser.
- c) It prevents (or filters) access to an unauthorized Web site.
- d) It detects a virus that infects a computer through a network.

Q36. Which of the following is an appropriate description concerning the security and reliability of an e-mail?

- a) Even if encryption is not performed, persons other than the recipient cannot view the body and attachments of an e-mail during transmission.
- b) Even if the e-mail address in the sender column of a received e-mail is that of a known person, the e-mail may not necessarily be from the identical person.
- c) A transmitted e-mail always reaches the recipient.
- d) The body and attachments of an e-mail cannot be falsified during transmission.

Answer questions Q37 through Q57 concerning management.

Q37. When the normal data range of the input item “age” (an integer) is $15 \leq \text{age} \leq 60$, which of the following is an appropriate combination of test data for boundary value analysis?

- | | |
|-------------------|-----------|
| a) 14, 15, 60, 61 | b) 14, 61 |
| c) 15, 16, 59, 60 | d) 15, 60 |

Q38. A software integration test is performed by a staff member in charge of the test, but the test results are different from the description of the test specifications. Under such circumstances, which of the following is an appropriate course of action to be taken by the member?

- a) Reviewing all test data including the data completed successfully by that time
- b) Performing the test again after changing the test cases
- c) Continuing the test after changing the program
- d) Requesting the developer to change the program after recording the problem

Q39. An attempt is being made to create a program that analyzes the results of sales events for each product by using macro functions of spreadsheet software. Which of the following is an appropriate activity of software requirements definition for this program?

- a) Considering the operation logic of the macros to be embedded, prior to writing the program
- b) Trying to run the program with test data in order to check whether the embedded macros work properly
- c) Selecting all the data items that need to be collected
- d) Entering the monthly sales data of each product for the analysis target year into the spreadsheet software

Q40. A company is planning to transfer a file containing accounting data created with a PC in text format to the company-wide accounting system managed by the information systems department. Which of the following is the most appropriate item which should be checked in advance?

- a) The character code set used in each application
- b) The number of bits in the arithmetic operation registers in each CPU
- c) The type of operating system used for each computer
- d) The programming language used for implementing each application

Q41. Which of the following is an appropriate explanation of the regression test?

- a) Testing to make sure that updated content does not adversely affect other functions that have been operating normally until then
- b) Testing ease of operation in addition to ease of understanding of displayed messages
- c) Testing to make sure that there is no disruption in business operations even when the amount of data is increased or even when some processing requests are simultaneously received
- d) Testing to make sure that any incorrect input is identified as an error

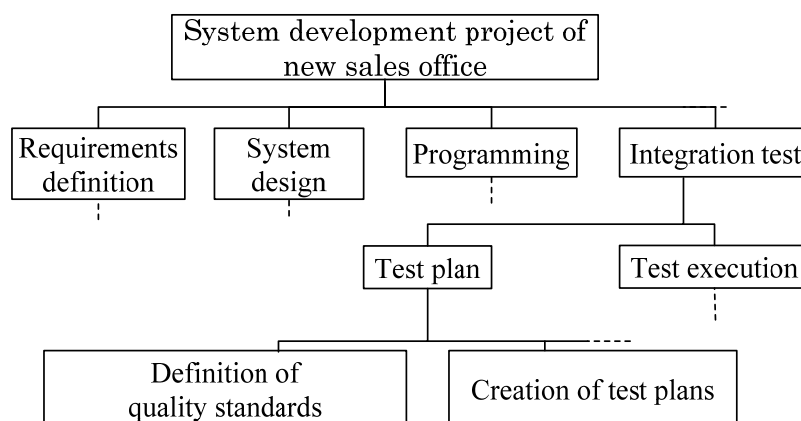
Q42. Which of the following is an appropriate description concerning the characteristics of the prototyping model?

- a) Through a trial model in the initial stage of the development process, the user interface is determined and the system performance is verified, in order to reduce the risk of rework caused by specification change in subsequent phases.
- b) It is a type of growth model where the system is refined by repeating development processes. In each iteration process, risk is assessed based on development cost and quality, and the process with the lowest risk is adopted.
- c) Through a series of system development processes, some functions are completed. The entire system is developed in incremental steps by repeating such a cycle.
- d) It is performed in order of requirements analysis, system design, production, and test. It is suitable for large-scale system development.

Q43. A company purchased the enterprise license of software *X* that is used for 100 PCs, and then installed it on those PCs. Which of the following is an action that complies with the license agreement?

- a) Of the 100 PCs, 10 PCs are moved to another department without uninstalling software *X* from the hard disks, and continue to be used.
- b) 10 PCs are additionally purchased, and software *X* is installed on those PCs without purchasing additional licenses.
- c) After sales of software *X* is discontinued, the company stops managing the license keys and allows users to install it freely.
- d) License usage is controlled so that the number of PCs concurrently using the software, not the number of PCs on which software *X* is installed, is equal to or less than the number of purchased licenses.

Q44. Which of the following is a technique that represents, hierarchically as shown in the figure below, activities of the system development project of a new sales office?



- a) PERT (Program Evaluation and Review Technique)
- b) WBS (Work Breakdown Structure)
- c) Structured programming
- d) FP (Function Point) method

Q45. The allocation of person-days for a project is as shown in the table below. The phases from basic design to program design are completed as planned. In the programming phase, there are 3,000 programs, of which 1,200 are completed. Which of the following is the current percentage of completion for the entire project?

Basic design	Detailed design	Program design	Programming	Testing
0.08	0.16	0.20	0.25	0.31

- a) 40 b) 44 c) 54 d) 59

Q46. In the integration test phase of the development of a system, additions and changes to functions that have been developed are necessary, and a change to the configuration of the database is also planned. Among descriptions *A* through *D* concerning the response or reaction of the project manager, which of the following is the list that contains only the appropriate descriptions?

- A*: Revising the WBS and reviewing the project schedule
B: Estimating the cost required for the additions and changes
C: Identifying risks involved in the configuration change to the database
D: Performing the changes after completing the initially planned integration test

- a) *A, B, C* b) *A, B, D* c) *B, D* d) *C, D*

Q47. Mr. *A* is appointed as the project manager of a project to add functions to the finance system. He gets a risk checklist that was used in a past project in order to create a new risk checklist for the project. Which of the following is an appropriate description concerning the risk checklist?

- a) The past risk checklist was created based on past information and knowledge, so it is used as a reference for the new checklist that is to be created.
b) The past risk checklist is created based on past information and knowledge, so risks that are not mentioned in it do not need to be considered.
c) The past risk checklist is used without modification in order to ensure that there are no discrepancies between projects.
d) Risks change with projects, so a new risk checklist is created based on only the risks that are not mentioned in the past risk checklist.

Q48. Among descriptions *A* through *D* concerning the cost management, progress management, and quality management of a project, which of the following is the list that contains only the items about progress management?

- A*: Confirming that when there is a problem with deliverables, it is corrected in accordance with the specifications
- B*: Confirming that measures against problems, such as the correction of deliverables, do not lead to a budget overrun
- C*: Confirming that the deliverables are delivered by the vendor before the start of the qualification test
- D*: Confirming that the deliverables are created on schedule at each milestone

- a) *A, B* b) *B, C* c) *B, D* d) *C, D*

Q49. Which of the following is an appropriate description of an SLA?

- a) A point of contact for an inquiry from a user of an IT service
- b) A document in which best practices for IT service management are described
- c) A contract between a service provider and a client that defines the service content
- d) A database that is created to manage the configuration items of services or IT assets

Q50. Among the management activities for an information system that are performed by IT service management, which of the following is a process that provides a temporary workaround for a system failure and performs a prompt recovery?

- a) Incident management b) Change management
- c) Problem management d) Release management

Q51. When revised business process procedures were distributed at the start of operational tests for a new application system, many people complained that it was difficult to understand those procedures. Which of the following is a possible cause for this complaint?

- a) Improvements in the framework and flow of the business process were described.
- b) In line with the business process flow, countermeasures against the occurrence of a system failure were described.
- c) System functions were described in detail exactly as specified in the program design document.
- d) Previous business process procedures that were difficult to understand were revised and a revision history was organized into a single part.

Q52. A notification of a version upgrade is received for the OS of a PC that is used for business operations. A database system and an application program are running on this PC. Which of the following is an appropriate operation procedure for version upgrade?

- a) Before the OS is upgraded to the new version, the relationship between the version of the OS and the versions of the application program and database system is investigated. As a result, operation of the application program is not guaranteed, so the version upgrade is postponed for the time being.
- b) The OS is the most fundamental software, so it can be considered separately from the database system and application program that are currently in use. Therefore, the version upgrade is performed immediately in consideration of the future support.
- c) The application program is determined to be unrelated to the version of the OS, and only the relationship between the database and the OS is investigated. As a result, no problems are found, so the version upgrade is performed.
- d) The database system is a part of the data management function of the OS, and by replacing the OS, the version of the database system is also upgraded. Therefore, only the relationship between the application program and the version of the OS is investigated. As a result, no problems are found, so the version upgrade is performed.

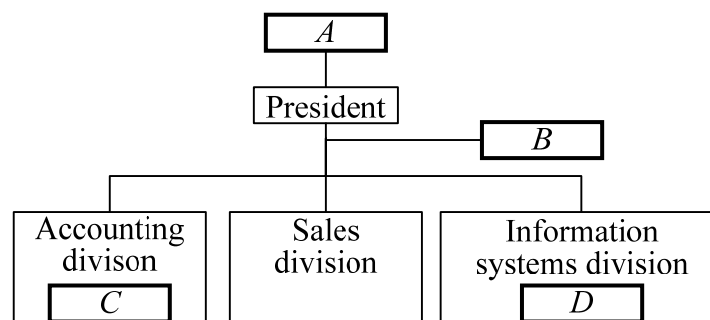
Q53. Which of the following is an appropriate description concerning change management in the operations of an information system?

- a) It reduces the effect of discontinuation of an IT service and enables users to resume activities as soon as possible.
- b) It helps to investigate the cause of a fault and consider preventive measures against recurrence.
- c) It makes a plan for implementing approved changes and ensures that the plan is properly processed.
- d) It enables accurate understanding of changed IT assets and prevents unintended usage.

Q54. Which of the following is an appropriate explanation concerning the usage of a UPS (Uninterrupted Power Supply)?

- a) It is used as a spare battery for a cell phone in order to use the cell phone for a longer time.
- b) It is used to continue the supply of power when a long power failure occurs in a computer center.
- c) It is used to temporarily supply power to a computer when a power failure occurs, and to safeguard the computer against a momentary drop in voltage.
- d) It is used to enable the use of a computer for a long time in an outdoor area where no other power source is available.

Q55. Which of the following is an appropriate positioning of the system audit department in a company?



- a) A
- b) B
- c) C
- d) D

Q56. Which of the following is an appropriate description concerning the implementation of a system audit?

- a) An audit is performed without making an audit plan.
- b) Guidance for improvement based on the audit results is not provided.
- c) Facts are not confirmed before an audit report is created.
- d) A preliminary audit is performed before the main audit.

Q57. Which of the following is an explanation of IT governance?

- a) The ministries and agencies that have control over IT policy
- b) The satisfaction level of users concerning IT
- c) The ability of an organization to appropriately use IT
- d) The scheme of customer management that uses IT

Q58. Which of the following is an explanation of OJT?

- a) It is a methodology that actually uses an OA device for technical training and theory acquisition for a company's internal activities.
- b) It is personnel training that is performed in order to reform organizational climate and organizational culture internally through activities in small groups.
- c) It is training where practical knowledge and skills are acquired on-site directly from a supervisor or a senior through daily activities.
- d) It is comprehensive training that raises an employee's qualification to a certain level and is provided in consideration of positional changes, such as promotion and reassignment, based on the wishes and suitability of the employee.

Q59. Which of the following is an organization structure where each employee is under supervision of two or more managers but tries to achieve coordination between goal-based project management and the functional responsibilities of departments?

- a) Divisional system organization
- b) Intra-venture organization
- c) Functional organization
- d) Matrix organization

Q60. Which of the following is the appropriate explanation of ABC analysis?

- a) A method for systematically identifying the cause of a problem by using a diagram that looks like a fish skeleton
- b) A method for analyzing whether there is a relationship between two variables by using collected data
- c) A method for extracting samples from a population, testing the samples, and determining the quality of the population, based on the number of defects in the samples
- d) A method for ranking the importance of items, based on the cumulative percentage distribution of sales and others in order to clarify the items to be controlled preferentially

Q61. In customer service, which of the following is a theory that is used to analyze the number of windows and the service hours according to the arrival status of customers?

- a) Graph theory
- b) Game theory
- c) Information theory
- d) Queueing theory

Q62. Which of the following is the part of a cash flow statement where the income from product sales is recorded?

- a) Sales activities
- b) Financial activities
- c) Investment activities
- d) Administrative activities

Q63. Which of the following is a cost that has a relationship with the calculation of operating profit in an income statement?

- a) Advertising cost
- b) Loss on disposal of fixed assets
- c) Interest paid
- d) Corporate tax

Q64. When a Web page is created and published on the Internet, which of the following results in an infringement of the copyright?

- a) Copying the text of a purchased book with an image scanner, and using it without the permission of the author
- b) Creating an image with shareware during the trial period, and using it even after the expiration of the trial period
- c) Providing a link to another person's Web page instead of incorporating the content of the page
- d) Imitating the frame size and background color of the Web page of another person in order to create the Web page

Q65. Which of the following is the purpose of the protection of personal information?

- a) To protect the victims who are the weak by assuming incidents and accidents involving personal information and then defining the rules for the victim to claim for damage from the perpetrator
- b) To assure unrestricted activities and honor of individuals by strictly limiting the scope of handling personal information
- c) To expand and develop businesses related to personal information by defining detailed protection rules for the buying and selling of personal information or other similar behaviors
- d) To prevent infringement of personal rights and benefits caused by the improper handling of personal information

Q66. An e-mail with a subject of “Caution: New computer virus” was received from the external network. The sender is not a well-known person, and the content may or may not be true. However, the e-mail describes the characteristics of the virus, and instructs that the e-mail must be forwarded to as many people as possible. Which of the following is an appropriate course of action to be taken in response to this e-mail?

- a) The e-mail is forwarded to acquaintances.
- b) The e-mail is forwarded to all employees.
- c) The e-mail is not forwarded to anyone.
- d) An e-mail is sent to the sender to ask for countermeasures against the virus.

Q67. Which of the following is the characteristic of QR code?

- a) Reading direction is identified using position detection patterns (cut-out symbols).
- b) It requires more space than a one-dimensional bar code to represent the same amount of data.
- c) It can only encode numbers and alphabetical characters.
- d) It is a stacked bar code, which is composed of a set of bar codes stacked vertically one above another.

Q68. Which of the following is an appropriate description concerning certification to ISO 9001:2008?

- a) Once a party is certified, the qualification is semipermanent.
- b) Certification is applied to manufacturing industries, not to service industries.
- c) There is only one certification body in each country.
- d) “Organizations which fulfill the international standard requirements for a quality management system” are assessed and certified.

Q69. Which of the following is the responsibility of top management specified in “ISO 9001:2008 Quality management systems – Requirements”?

- a) Top management must provide evidence of the commitment to the development, implementation, and improvement of the quality management system.
- b) Top management must set quality objectives for each department and hierarchy of the organization.
- c) Since top management is responsible for quality control, it must be ensured that necessary processes is established, implemented, and maintained without any delegation of authority.
- d) In the event of a defect or unsatisfactory condition, top management must stop any subsequent process until the defect or unsatisfactory condition is corrected.

Q70. Which of the following refers to a set of skills or techniques that delivers value to customers, acts as the source of competitive superiority for a company, and is also difficult for competitors to imitate?

- | | |
|-------------------------|--------------------|
| a) Accountability | b) Core competence |
| c) Corporate governance | d) Personal skill |

Q71. The utilization of electronic commerce over the Internet is one of the business strategies for creating competitive superiority. Which of the following is “B to C” electronic commerce?

- a) An auction site where general consumers sell products
- b) An Internet shopping site for general consumers
- c) A site for transactions between businesses, such as sale of raw materials to other companies
- d) An in-house sales site for the company’s employees for the purpose of welfare benefits

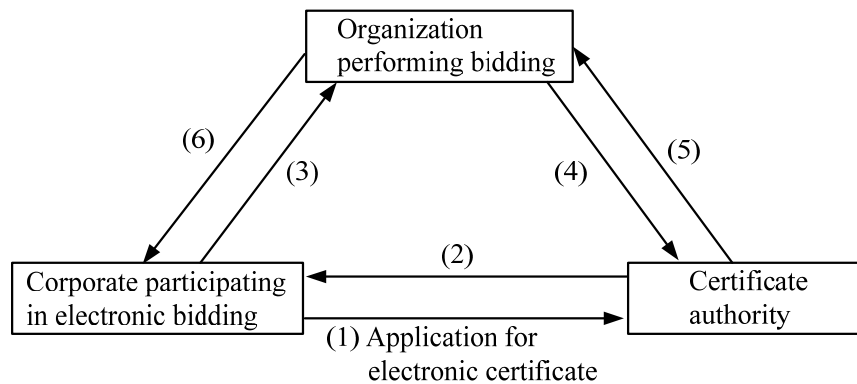
Q72. Which of the following is an appropriate explanation of opinion leaders who are thought to be important for market penetration of a new product?

- a) The tier of people who purchase the product after making sure that many people are using it.
- b) The tier of people who take a cautious approach and purchase the product after checking with the early buyers
- c) The tier of people who purchase the product early on their value judgment and have an influence on other consumers who follow behind
- d) The tier of people who are adventurous enough to take the initiative in purchasing the product

Q73. Which of the following is the method for implementing marketing strategies by combining multiple marketing elements?

- | | |
|----------------------|----------------------|
| a) Marketing concept | b) Marketing channel |
| c) Marketing mix | d) Merchandising |

Q74. A series of procedures, from the application for an electronic certificate to the implementation of electronic bidding, are performed according to steps (1) through (6). Which of the following is an appropriate procedure to be performed in step (4)?



- a) Notifying the results of bid opening
- b) Issuing an electronic certificate
- c) Checking the effectiveness of the electronic certificate
- d) Performing electronic bidding

Q75. Which of the following is an appropriate application suitable for groupware?

- a) Aggregation processing of end-of-term exam scores
- b) Aggregation processing of month-end sales
- c) Air traffic control processing
- d) Reservation processing of internal conference rooms

Q76. Two groupware applications on servers connected to a WAN are to be developed. One is a product catalog system that must support regular updates of huge amounts of data including images. The other is a conference room reservation system that must support updates in real time. The groupware has the replication function which automatically provides the copying of data from one place to another and maintaining the synchronization of different databases on multiple servers. When the application operations and the data amount are taken into consideration, which of the following is the most appropriate allocation of databases for the product catalog system and the conference room reservation system?

- a) The product catalog system and the conference room reservation system are both on a single server.
- b) Distributed databases with replication are used for both the product catalog system and the conference room reservation system.
- c) A single server is used for the product catalog system, and distributed databases with replication are used for the conference room reservation system.
- d) Distributed databases with replication are used for the product catalog system, and a single server is used for the conference room reservation system.

Q77. Which of the following is the situation where an improvement can be expected by installing an MRP (Material Requirements Planning) system?

- a) Drawing information is managed on both electronic files and hard copies, so the history of design changes cannot be correctly understood.
- b) Information about materials necessary for manufacturing and their required quantities is complicated, so order quantities are often miscalculated and production is adversely affected.
- c) There are many design changes, so production efficiency does not improve.
- d) High-mix, low-volume production is adopted, so the cost of installing production equipment is increasing.

Q78. Which of the following is a production system for high-mix low-volume production where one or a few staff members are in charge of all production processes from first to last, rather than for a division of labor based on the conveyor belt system?

- a) Cell production
- b) Fabless production
- c) Line production
- d) Lot production

Q79. Which of the following is an explanation of EDI (Electronic Data Interchange)?

- a) It is an international standard for e-mail services, based on the OSI basic reference model, which provides comprehensive services for the creation, transmission, and processing of messages. It also enables the interconnection between heterogeneous systems.
- b) It is the exchange of business transaction data between computers (including terminals) over a communication line. A set of standard protocols is used to describe various rules or regulations that must be followed by the parties involved.
- c) It is a communication service that provides added values, such as storage of data transmitted over the network and conversion of data formats.
- d) It is an ordering system that allows orders to be placed by transmitting order information from a data entry terminal to the head office or a supplier. This system saves labor in processing orders, and improves the efficiency of logistics and inventory control.

Q80. Which of the following is an appropriate benefit of employing an embedded system in an electrical appliance?

- a) The structure of software is different from that of a PC, so there is no risk of a virus infection.
- b) The system design is not affected by hardware limitations.
- c) When the product is to be improved, a certain range of functions can be added simply by changing the software.
- d) An environment that guarantees fail-safe is provided, so it is not necessary to take measures for each system.

Q81. Which of the following is the most appropriate description concerning the role of CIO?

- a) Making an audit of the company from an objective standpoint in order to check if there is no problem with business operations and IT control works effectively
- b) Playing a leading role in the planning and execution of an information strategy for implementing a business strategy
- c) Establishing a personnel system for implementing a business strategy, and controlling overall administrative operations such as the understanding of the actual situation of services
- d) Improving the efficiency of allocating company funds, and ensuring the accuracy of financial accounting

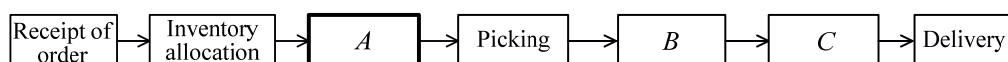
Q82. When investment projects concerning system development are planned as shown in the table below, which of the following can recover the investment in the shortest period? Here, 10% of the initial investment is incurred as an annual management cost.

Unit: million dollars

Project name	Initial investment	Profit plan		
		First year	Second year	Third year
Investment project A	20	5	15	20
Investment project B	30	10	20	30
Investment project C	50	20	40	40
Investment project D	60	30	40	40

- a) A
- b) B
- c) C
- d) D

Q83. The figure below shows a series of business operations from the receipt of an order until the point of delivery in a sales and distribution industry. Which of the following is an appropriate term or phrase to be inserted into blank A?



- a) Shipping instruction
- b) Loading
- c) Inventory taking
- d) Distribution

Q84. Which of the following is the most appropriate explanation of the system integration service?

- a) Service in which products of multiple vendors are combined and activities such as design, implementation, testing, operations, and maintenance of an optimal system are undertaken as a package
- b) Service in which project members are dispatched to undertake project management for constructing an information system under a multivendor environment
- c) Service in which the operations and maintenance of an information system under a multivendor environment are undertaken as a package and a single point of contact for the activities is provided
- d) Service in which system requirements are analyzed and defined in cooperation with the user

Q85. Which of the following is an appropriate combination of the descriptions *A* through *C* concerning IT-related services that are used in business operations, and the names of the services?

A: Using co-location servers and communication equipment at the facility of a service provider

B: Allowing users to obtain the use of some communication equipment and servers that are owned by the dedicated service provider

C: Allowing users to use only the necessary functions of software as a service via the network when needed

	<i>A</i>	<i>B</i>	<i>C</i>
a)	SaaS	Hosting	Housing
b)	Housing	Hosting	SaaS
c)	Housing	SaaS	Hosting
d)	Hosting	Housing	SaaS

Q86. In a software life cycle that proceeds in order of planning process, requirements definition process, development process, and maintenance process, which of the following is an appropriate activity to be performed at the stage of the planning process?

- a) Defining the functional requirements and non-functional requirements
- b) Checking the management-related needs and issues
- c) Designing and evaluating the systems architecture
- c) Designing and evaluating the software architecture

Q87. Which of the following is the most appropriate description concerning the creation of documents in the development and maintenance of software?

- a) When an itemized list or a chart is used, meaning and content become unclear. Therefore, text based on natural language is used as much as possible.
- b) A clear relationship between documents is important, and based on this, a consistency check of the content of each document can be performed, which leads to an improvement in quality.
- c) Duplication and redundancy of the content of a document are necessary to improve not only the maintainability of the software but also the maintainability of the document.
- d) The first priority is that a document can be understood better by developers than by maintenance personnel, and it is desirable to improve productivity without taking too much time.

Q88. When system development vendors offer proposals based on an RFP (Request for Proposal), which of the following is the most appropriate method for selecting a development vendor?

- a) Selecting a vendor by comparing the proposals, based on predetermined evaluation criteria
- b) Selecting the vendor with the lowest development cost, regardless of the content of a proposal, in order to reduce the development cost
- c) Selecting a vendor by evaluating each vendor's strengths and weaknesses by using a SWOT analysis
- d) Selecting a vendor by measuring how well the functions of the proposed system are designed, by means of the FP (Function Point) method

Answer questions A through C, each of which has four questions.

Question A Read the following description concerning digital images, and then answer **Q89** through **Q92**.

When characters or symbols are shown with black and white digital images of seven vertical pixels and seven horizontal pixels, the number “0” is represented as shown in Fig. 1. There exist three processes: the process for generating the digital image as pixel data, the process for compressing the pixel data, and the process for rotating the digital image.

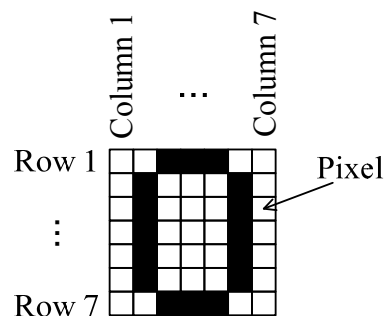


Fig. 1 Digital image for number “0”

Each outline of the processes for generating and compressing the pixel data is described below.

[Outline of the process for generating the pixel data]

- (1) When the color of the pixel is white or black, “w” or “b” is respectively generated as the pixel data.
- (2) The pixel data of each position is generated in order of Row 1 Column 1, Row 1 Column 2, ..., Row 1 Column 7, Row 2 Column 1, Row 2 Column 2, ..., Row 7 Column 7.
- (3) When the pixel data is generated, each element of the pixel data is delimited with a comma “,”.
- (4) The result of generating the pixel data of Fig. 1 is shown below, and the number of characters is 97, including commas.

w,w,b,b,w,w,b,w,w,w,b,w,w,b,w,w,b,w,w,b,w,w,b,w,w,b,w,w,w,w,w,b,w,w,b,w,w
w,b,w,w,w,b,b,w,w

[Outline of the process for compressing the pixel data]

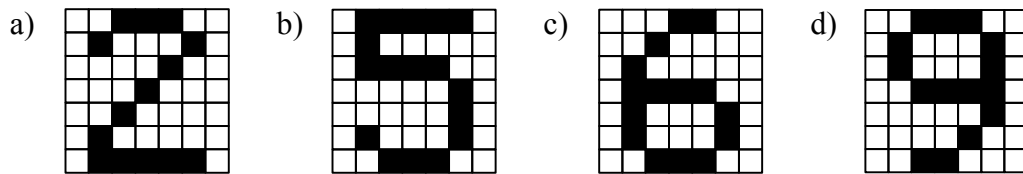
- (1) When there is a series of pixel data with the same color, the number of continuous pixels is generated after “w” or “b”. For example, “b,b,b” becomes “b3”.

- (2) The result of compressing the pixel data of Fig. 1 is shown below, and the number of characters is 64, including commas.

w2,b3,w3,b,w3,b,w2,b,w3,b,w2,b,w3,b,w2,b,w3,b,w2,b,w3,b,w3,b3,w2

[Technology]

- Q89.** When the pixel data is generated without compression, which of the following is the digital image where the 29th through 41st characters are “w,b,w,w,w,b,w”? Here, commas are counted in the number of characters.



[Technology]

- Q90.** When the digital image shown in Fig.2 is generated and compressed as the pixel data, what is the total number of characters including commas?

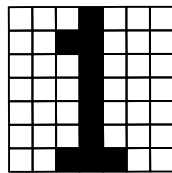


Fig. 2 Digital image for number “1”

- a) 34 b) 39 c) 42 d) 44

[Technology]

Q91. When the flowchart below shows the process for rotating the digital image by 90 degrees to the right, which of the following is an appropriate term or phrase to be inserted into blank A of Fig. 3?

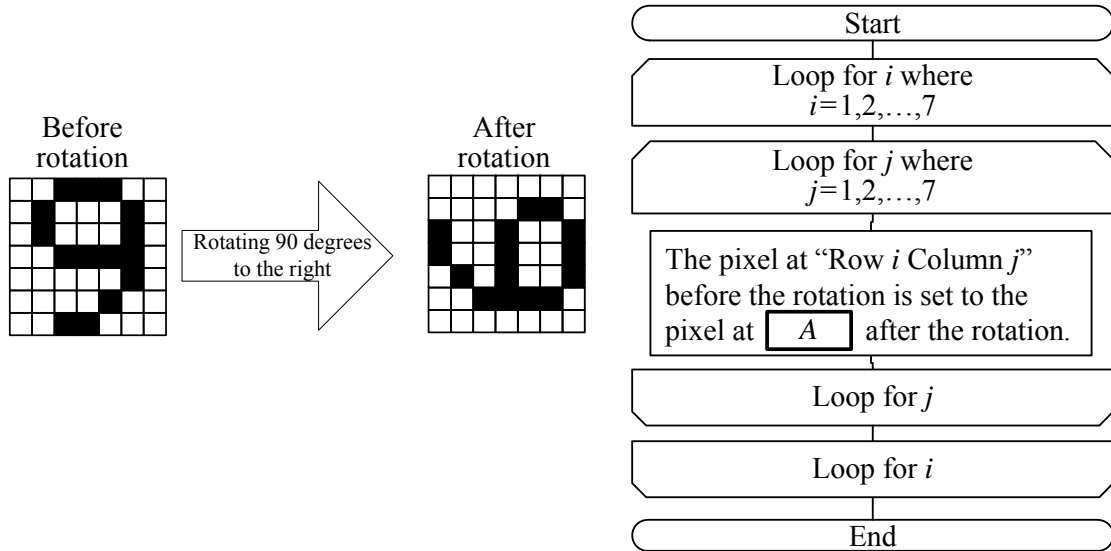


Fig. 3 Process of rotating the digital image 90 degrees to the right

- | | |
|---------------------------|---------------------------|
| a) Row $(8-i)$ Column j | b) Row $(8-j)$ Column i |
| c) Row i Column $(8-j)$ | d) Row j Column $(8-i)$ |

[Technology]

Q92. Each of the three digital images shown in Fig. 4 is rotated 90 degrees to the right. For each image, the number of characters that are generated as a result of compression of the pixel data after rotation is subtracted from the number of characters before rotation. Which of the following is the appropriate list where the three images are arranged in descending order of these resulting values? Here, the number of characters includes the commas.

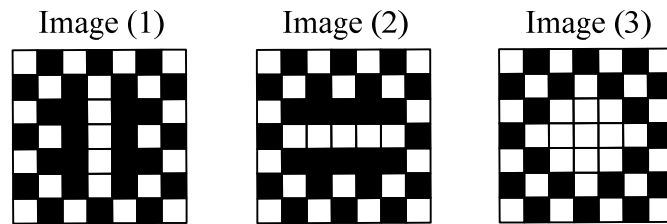


Fig. 4 Three digital images

- | | |
|------------------------------------|------------------------------------|
| a) Image (1), image (2), image (3) | b) Image (1), image (3), image (2) |
| c) Image (2), image (1), image (3) | d) Image (2), image (3), image (1) |

Question B Read the following description concerning the development of a product sales system that uses the Internet, and then answer **Q93** through **Q96**.

Company *M* is engaged in the accessories business. As a new business, Company *M* considers the sale of accessories to general consumers over the Internet.

Mr. A is in his second year in the company and works in the sales planning department. He is selected as a member for investigating the sale of accessories and is assigned to the construction of a system for selling products over the Internet (hereinafter, the Internet ordering system). Mr. A takes notes, in order of what he notices, of activities that should be performed in order to construct the Internet ordering system.

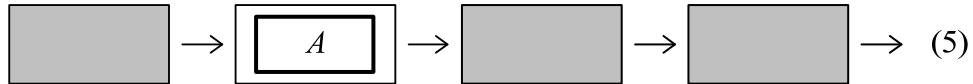
Here, Company *M* decides to outsource the construction of the Internet ordering system to Company *X*.

[Notes of Mr. A]

- (1) To hear demands and requests concerning the Internet ordering system from employees who sell accessories and customers who purchase accessories, and then describe them in a document
- (2) To notify the requirements of the Internet ordering system to Company *X*, and then to take delivery of the Internet ordering system constructed by Company *X*, including the program design document and test report created by Company *X*
- (3) To describe the system requirements that should be implemented based on the demands and requests for the Internet ordering system
- (4) In order to determine whether the requirements on the Internet ordering system are fulfilled, Company *M* should test the Internet ordering system received from Company *X*. The results are to be described in the test report of Company *M*.
- (5) To validate the Internet ordering system, based on the test results performed by Company *M*, and to determine if it is ready for operation, and after that, to start sales by using the Internet ordering system if it is determined that the system is ready for operation

[Management]

Q93. When activities (1) through (5) in “Notes of Mr. A” are arranged in order of execution, which of the following is the appropriate activity to be inserted into A? Here, the activities in the shaded boxes are not shown, and “ \longrightarrow ” represents the execution sequence.



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

[Management]

Q94. When Mr. A consults a senior employee about the number of pages of the system requirements document created in activity (3) of “Notes of Mr. A”, he receives a reply that approximately 300 pages are needed based on the senior employee’s experience. How many workers at a minimum are required to complete this 300-page document in 10 days under the conditions below?

[Conditions]

- (1) Each worker writes 8 pages per day. The productivity of all workers is the same.
- (2) When multiple workers are involved, a meeting is held between every pair of workers once a day.
- (3) The meeting is held between all possible pairs of workers, and the meeting time for each pair of workers is equivalent to the time taken to write 0.5 pages. For example, if there are three workers, one worker needs to hold a meeting with each of the other two workers, and therefore, the time equivalent to writing one page is required in all. Therefore, in such a case, the actual number of pages that a worker can write in a day is reduced to seven.

- a) 4 b) 5 c) 6 d) 7

[Management]

Q95. Mr. A breaks down activity (4) of “Notes of Mr. A” into smaller work items (i.e., Test 1 through Test 4 and the creation of test report). Table 1 shows the number of days and the dependency relationship for each work item. How many days are required for the critical path of this activity?

Table 1 Number of days required for work items and dependency relationship between the work items

Work item	Number of days	Preceding work item
Test 1	3	None
Test 2	4	Test 1
Test 3	2	None
Test 4	5	Test 1, Test 3
Creation of test report	2	Test 2, Test 4

a) 7

b) 8

c) 9

d) 10

[Management]

Q96. Before operating the Internet ordering system, Company *M* decides to hold a meeting to determine whether or not the system can be brought into full operation, based on activity (5) of “Notes of Mr. A”. Thus, Mr. A prepares the documents required for this meeting. Which of the following is an appropriate combination of document numbers to be inserted into blanks *B* and *C*? Here, the documents that are listed in Table 2 are created in activities (1) through (4) of “Notes of Mr. A”.

The decision of whether to bring the system into full operation is made based on the results of *B*. Furthermore, the evaluation of whether the content described in *B* is proper and sufficient is made as compared with *C*.

Table 2 Created documents

Notes of Mr. A	Created document	Document number
(1)	the document containing a summary of the requests and requirements from the employees and customers	i
(2)	the program design of Company <i>X</i>	ii
	the test report of Company <i>X</i>	iii
(3)	the document containing a summary of the system requirements to be implemented	iv
(4)	the test report of Company <i>M</i>	v

	<i>B</i>	<i>C</i>
a)	iii	i
b)	iii	iv
c)	v	ii
d)	v	iv

Question C Read the following description concerning a sales improvement project, and then answer **Q97** through **Q100**.

Company *S* is engaged in the business of selling clothes and accessories, and has several dozen chain stores. Recently, the growth in its sales volume has reduced as compared with competitors. Therefore, it has started a sales improvement project. Mr. *A* is in his second year in the company and works in the sales planning division. He is selected as a member along with Mr. *B* who is a senior employee.

In the sales improvement project, the effect of the sales promotion activities (hereinafter sales promotion) entrusted to each store needs to be improved. In order to investigate the current state of each store, the problems and requirements are to be identified. Investigation can be performed based on a questionnaire or an interview. For this investigation, the interview-based investigation is performed. After Mr. *A* hears the explanation from Mr. *B* about points for attention in the interview-based investigation, Mr. *A* interviews the store manager of each store, and lists the problems and requirements common to multiple stores.

[Points for attention in the interview-based investigation]

- (1) In order to effectively investigate the actual state and problems of the sales promotion in a short time, the main questions should be prepared beforehand.
- (2) Regarding the order of questions, a logical flow should be considered. For example, the questions should unfold starting from general ones and leading to specific ones, and also the questions should unfold according to the temporal flow of the target activities.
- (3) There should not be any variation in perception between the side performing the investigation and the side being investigated.

[Problems and requirements of stores]

- (1) Part-time employees and new employees have poor knowledge of products. Therefore, stores that hire such employees would like to train them so as to acquire knowledge about products and information about current fashion.
- (2) It is desired to increase sales by improving the satisfaction level of customers and achieve the sales target determined by each store.
- (3) It is necessary for a store employee to appropriately answer questions put forward by a customer concerning products, and to recommend products according to the tastes of the customer.

Under the guidance of Mr. *B*, a solution to problems and requirements of the stores is considered by Mr. *A*, and a plan for the sales improvement project (hereinafter the project plan) is created. Furthermore, in the case of creation of several solutions, the expected

effect of each solution is to be compared in terms of numeric values, and the feasibility of executing the solution is to be determined.

[Strategy]

Q97. Which of the following is an appropriate reason for selecting interview-based investigation rather than questionnaire-based investigation as the technique in this sales improvement project?

- a) The questions put forward to each store manager can be standardized.
- b) The questions can be changed flexibly according to the actual state of each store.
- c) Investigation can be performed simultaneously without any extra cost in a short period of time.
- d) The questions that are not affected by the subjectivity of the investigator can be put forward.

[Strategy]

Q98. Which of the following is an appropriate method for conducting interview-based investigation according to the “Points for attention in the interview-based investigation”?

- a) Asking questions about all business operations of the store including products purchased or returned, exhibitions, sales promotions, and sales aggregation
- b) Respecting the individual opinion of the store manager, and continuing with the interview-based investigation even when the store manager consistently replies outside the context of the purpose of the interview-based investigation
- c) Taking notes of the answers obtained from the store manager, and after the completion of the interview-based investigation, checking with the store manager to rule out any errors in the notes
- d) Asking questions only about products that have good sales in each store

[Strategy]

Q99. When Mr. A lists out the solutions concerning the “Problems and requirements of stores” in the project plan, a cause-and-effect relationship is observed in each requirement. So, these relationships are described in proper order of cause and effect as scenarios in the project. When (1) through (3) are described in the project plan, which of the following is an appropriate order of description? Here, the description “(A) → (B)” indicates a cause-and-effect relationship where the solution to (A) promotes the solution to (B).

- a) (1) → (2) → (3)
- b) (1) → (3) → (2)
- c) (2) → (3) → (1)
- d) (3) → (1) → (2)

[Strategy]

Q100. Mr. A considers performing sales promotion aimed at the customers who are members. Thus, the four sales promotion plans shown in Table 1 are considered, and the cost and amount of return for each plan are estimated. The expected amount of return is classified into large, medium, and small, and the probability of occurrence for each classification of the amount of return is estimated to be 0.2, 0.5, and 0.3, respectively. Based on this estimate, which of the following is a sales promotion plan where the estimated profit is maximized? Here, the estimated profit is the value obtained by subtracting the cost from the expected value of the amount of return.

Table 1 Cost and amount of return of sales promotion plans

Unit: thousand dollars

Sales promotion plan	Cost	Amount of return		
		Large	Medium	Small
Invitations to product exhibitions and business meetings	70	150	120	60
Direct mail	60	150	100	50
E-mail	30	100	80	50
Telephone calls	50	120	100	50

- a) Invitations to product exhibitions and business meetings
- b) Direct mail
- c) E-mail
- d) Telephone calls