



Spring 2011

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 spring IT Passport Examination conducted in 2011?

- a) March b) April c) May d) June

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

[Sample Answer]

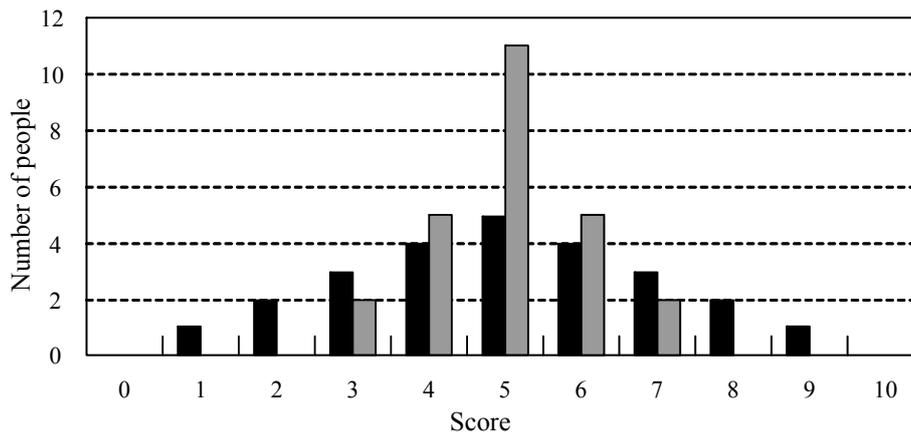
Q1	<input checked="" type="radio"/>	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D
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**Do not open the exam booklet until instructed to do so.
Inquiries about the exam questions will not be answered.**

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

Answer questions Q1 through Q37 concerning technology.

- Q1.** The graph below consists of two sets of bar graphs; one in black and the other in gray, with the vertical axis representing the number of people and the horizontal axis representing the score (0 through 10). Which of the following is observed in comparison of these black and gray bar graphs?



- a) The gray bar graph has a larger variance than the black bar graph.
b) The gray bar graph has a smaller variance than the black bar graph.
c) The gray bar graph has the same variance as the black bar graph.
d) A variance comparison cannot be made based on these black and gray graphs only.
- Q2.** A PC plays back moving image data recorded at 500×400 pixels per frame, 30 frames per second, and 3 bytes per pixel while reading it from a peripheral device. When the data transfer rate between the peripheral device and the PC is 1×10^6 bytes per second, in order to play back the moving image without delay, the data must be compressed to one n -th ($1/n$) in advance. Which of the following is the minimum value of n ? Here, the time to expand the compressed data and other impacts can be ignored.

- a) 18 b) 54 c) 72 d) 144

Q3. Which of the following is an explanation of proportional fonts?

- a) As is the case with Arabic fonts, the shape of a character changes when it is located at the beginning or end of a word.
- b) As is the case with fonts used in English newspapers, each character may occupy a different amount of space.
- c) As is the case with fonts used in the headline of an advertisement flyer, proportional fonts are characterized with distinctive decorative designs.
- d) As is the case with typewriter fonts, the number of characters per line is fixed.

Q4. Which of the following is an appropriate description concerning EUC (End User Computing)?

- a) As EUC is widely spread, information systems departments in companies come to have large backlogs in software development.
- b) EUC is characterized with system construction and operations management by end users without using software packages at all.
- c) To support EUC, training in programming languages such as COBOL, C, and Java is important, and it is a key role of information systems departments.
- d) In order to achieve EUC, it is necessary to provide education to end users in PCs or commercially available applications, and also to select easy-to-operate development tools and provide training in those tools.

Q5. Which of the following is an appropriate characteristic of data structure?

- a) Each element in an array can be read in any order by using an index.
- b) Arrays can be used to make the data structure independent from the algorithm.
- c) Each element in a list can be searched for and updated using an index in lieu of a pointer.
- d) When an element is inserted in a list or deleted from a list, existing elements must be moved.

Q6. There is a program that displays text in accordance with the specifications below. When the original text described below is displayed, in what point size does the program display the underlined character string? Here, the first character of the original text is displayed in 10 points.

[Specifications]

The characters between `` and `` are displayed one point larger than the preceding character.

The characters between `<S>` and `</S>` are displayed one point smaller than the preceding character.

Each of `` `` and `<S>` `</S>` must be used as a pair, and both of them can be nested with each other.

[Original text]

The system administrator promotes and implements ``department-level`` or `<S>`group-level`</S>` computerization`` from a user `<S>`standpoint`</S>`.``

- a) 10 b) 11 c) 12 d) 13

Q7. Which of the following is an appropriate explanation of SGML?

- a) It is a language from which HTML and XML are derived and is used to describe the logical structure of a document.
- b) It is an extended HTML-based language and is used for displaying images and documents on Web browsers.
- c) It is a standard for communication between electronic musical instruments and is used for processing music data.
- d) It is a standard page description language and is used for well-formed documents.

Q8. Which of the following is the method for describing the logical structure of a sentence in XML?

- a) Enclosing the sentence, clauses, and other elements with double quotes (“”)
- b) Separating the sentence, clauses, and other elements with commas
- c) Enclosing the sentence, clauses, and other elements with tags
- d) Separating the sentence, clauses, and other elements with tabs

Q9. Which of the following is an appropriate explanation of some functional units implemented in a computer?

- a) The operation unit performs arithmetic processing at the direction of the control unit.
- b) The operation unit exchanges data with the control unit, the input unit, and the output unit.
- c) The memory unit requests the operation unit to perform arithmetic processing and stores the results.
- d) The memory unit requests the output unit to read out data from the memory unit.

Q10. Which of the following is the latest interface that is widely used to transfer a large amount of data, such as 3D images or moving images, to graphics cards at higher speed?

- a) AGP
- b) ATA
- c) ISA
- d) PCI Express

Q11. Which of the following is the standard that is used to exchange data, such as address book data, between cell phones by using infrared rays?

- a) IEEE 1394
- b) IrDA
- c) RFID
- d) RS-232C

Q12. Which of the following is an appropriate description of plug-and-play used on a PC?

- a) A mechanism to start applications
- b) A mechanism which performs required settings automatically when peripheral devices are connected
- c) A mechanism which starts up an OS automatically when the power is turned on
- d) A mechanism to run software developed for another OS

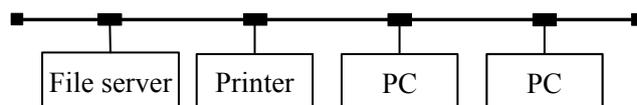
Q13. Which of the following is an appropriate description concerning a characteristic of RAID?

- a) It increases the data transfer rate of each hard disk drive.
- b) It provides a larger capacity than the total capacity of individual hard disk drives.
- c) It enhances the performance and reliability of the entire system by using multiple hard disk drives all together.
- d) It increases data access time because it needs to access multiple hard disk drives.

Q14. Which of the following is an appropriate description of fail-safe?

- a) Keeping the system harmless, even in the event of a failure or an operation error
- b) Operating only the normal parts of the system, even in the event of a failure, so as not to make an impact on the entire system
- c) Preventing intrusion into the computer network of an organization from outside
- d) Accepting only the data that meets specific conditions

Q15. There is a system consisting of two PCs, one file server, and one printer that are all connected to a LAN. The availability of the printer and file server are both 0.9, while the availability of each PC is 0.8. Which of the following is the appropriate expression to calculate the availability of the entire system? Here, the system is considered to be operating when at least one PC is running.



- a) $0.9^2 \times 0.8^2$
- b) $0.9^2 \times (1 - (1 - 0.8)^2)$
- c) $(1 - 0.9)^2 \times 0.8^2$
- d) $(1 - 0.9^2) \times (1 - 0.8)^2$

Q16. Which of the following is pertinent to the process of grouping multiple files into one, for the purpose of making effective use of storage media or promoting the efficiency of backup or distribution?

- a) Archive b) Allocate c) Patch d) Protect

Q17. Which of the following is the purpose of the virtual memory system that is one of the functions provided by an OS?

- a) To prevent an application program from accessing the area on the main memory used by the OS
b) To reduce electricity consumption while work is suspended, by turning off the power supply after data is written from the main memory to the hard disk
c) To make it possible to execute a program even if the program requires more storage capacity than is available in the main memory
d) To accelerate CPU processing through the intervention of a higher speed memory device than the main memory

Q18. Which of the following is an appropriate explanation of plug-in software?

- a) Plug-in software bridges differences between OSs, and provides more advanced and specific functions than the OSs.
b) Plug-in software is provided to replace parts of a program for the purpose of modifying functions or fixing bugs.
c) Plug-in software does not work as a standalone program, but can be integrated into applications, such as a Web browser, to enhance their functions.
d) Plug-in software is often included in applications such as spreadsheets, and allows the users to record and replay the series of operations performed.

Q19. An examination is conducted, and the results of the examination are grouped into four performance classes “Excellent,” “Good,” “Passed,” and “Not passed,” based on the scores by using spreadsheet software. To show the results of grouping in column C, an expression is entered in cell C1 and then copied to cells C2 through C35. Which of the following is the appropriate expression to be entered into cell C1? Here, the procedure for grouping is as shown below.

[Spreadsheet creation procedure]

- (1) Cells A1 through A35 contain scores.
- (2) Cell A36 contains a function to calculate the average score.
- (3) Cell B1 contains the expression below, and this expression is copied to cells B2 through B35.

$$A1 - \$A\$36$$

- (4) Performance classes are defined as follows: if the score is above the average by 10 points or more, it is marked as “Excellent”; if it is above the average by less than 10 points, it is marked as “Good”; if it is below the average by 10 points or less, it is marked as “Passed”; all other scores are marked as “Not passed.”

- a) IF(B1 > 10, ‘Passed’,
IF(B1 > 0, ‘Not passed’, IF(B1 < -10, ‘Excellent’, ‘Good’)))
- b) IF(B1 > 10, ‘Excellent’,
IF(B1 > 0, ‘Good’, IF(B1 < -10, ‘Passed’, ‘Not passed’)))
- c) IF (B1 ≥ 10, ‘Excellent’,
IF (B1 > 0, ‘Good’, IF (B1 < -10, ‘Not passed’, ‘Passed’)))
- d) IF (B1 ≥ 10, ‘Excellent’,
IF (B1 ≥ 0, ‘Good’, IF (B1 < -10, ‘Not passed’, ‘Passed’)))

Q20. When a spreadsheet application is used to create a line graph based on actual sales in the table below, the scale range of the vertical axis is automatically set between 0 and 1,500,000 dollars. However, as the graph does not show clearly how sales have changed over time, the fluctuation of sales needs to be more clearly emphasized without changing the frame size of the graph. When the graph-editing features are used for this purpose, which of the following is the most appropriate operation to be done?

Unit: dollar

Month	Actual sales
January	1,124,000
February	1,063,000
March	1,092,000
April	1,159,000
May	1,103,000
June	1,201,000
July	1,098,000
August	1,182,000
September	1,135,000
October	1,093,000
November	1,142,000
December	1,220,000

- a) Changing the unit of the vertical axis to 1,000 dollars, which will make the range from 0 to 1,500 (Unit: thousands of dollars)
- b) Changing the display range of the vertical axis to 1,000,000 through 1,300,000 dollars
- c) Converting the line graph to a bar graph
- d) Inserting an auxiliary line parallel to the horizontal axis for the purpose of indicating average sales

Q23. Which of the following is an appropriate policy for designing data entry screens?

- a) Related input items should be placed close to each other, in order to improve ease of operation on the screen.
- b) A method of entering commands should be provided, in order to ensure ease of operation even for entry-level users.
- c) A common message “Input Error” to all data entry errors should be displayed on the screen.
- d) Detailed directions for use should be displayed on the screen, in order to ensure ease of operation for users.

Q24. Which of the following can provide accessible linkage between information items represented in text, still images, video, sound, music, and other forms so that associated information can be reached by visiting one link after another?

- a) Graphical user interface
- b) Groupware
- c) Cyberspace
- d) Hypermedia

Q25. When relational databases are used, which of the following is an appropriate purpose of normalizing data?

- a) To guarantee data compatibility between heterogeneous computers
- b) To prevent data duplication as well as occurrence of inconsistency at the time of updating data
- c) To eliminate characters that cannot be transmitted when a database is used over a network
- d) To handle data storage areas distributed over multiple media as a contiguous storage area

Q26. Under an environment where several users have access to a database simultaneously, a user tries to view the data while another user is updating it. In order to assure data integrity, which of the following is an appropriate control method in the database management system?

- a) Interrupting update processing and permitting the user to view the data
- b) Permitting the user to view the latest data while updating
- c) Permitting the user to view the data after completion of the update
- d) Discarding the updated data and permitting the user to view the data before the update

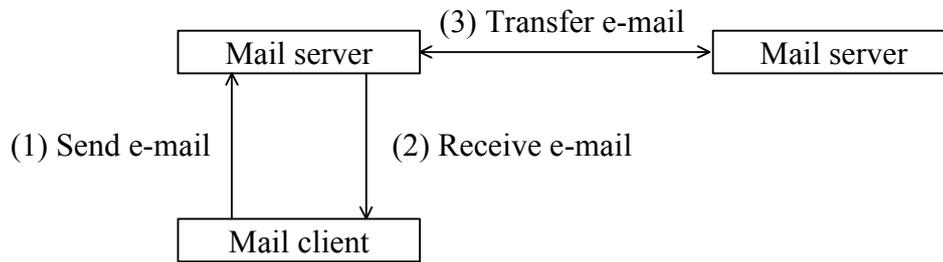
Q27. Which of the following is the network area that is provided by installing a firewall and is accessible from both the Internet and the intranet but not accessible to the intranet?

- a) DHCP
- b) DMZ
- c) DNS
- d) DoS

Q28. A Web server in Company *A* provides SSL communication using a digital certificate for the Web server generated by a certification authority. Which of the following is a procedure in which a PC accesses the Web server of Company *A* and after obtaining a digital certificate, uses the public key of the certification authority?

- a) Generating a common key used for encrypted communication and encrypting it by using the public key of the certification authority
- b) Using the public key of the certification authority to decrypt the common key used for encrypted communication
- c) Using the public key of the certification authority to verify the validity of the digital certificate
- d) Encrypting confidential data by using the public key of the certification authority

Q29. Which of the following is an appropriate combination of the protocols that are used for transmitting and receiving e-mail as shown in the diagram below?



	(1)	(2)	(3)
a)	POP3	POP3	SMTP
b)	POP3	SMTP	POP3
c)	SMTP	POP3	SMTP
d)	SMTP	SMTP	SMTP

Q30. Which of the following is a mechanism that enables a Web server to store user information in a browser in order to identify which PC is accessing the Web server?

- a) CGI b) Cookie c) SSL d) URL

Q31. When ten e-mail messages are sent successively from Company *A* to Company *B*, they may arrive at Company *B* in a different order from the order they are sent. Which of the following is an appropriate opinion on this matter?

- a) There is a problem with the setup of Company *A*'s mail server.
 b) There is a problem with the setup of Company *B*'s firewall for e-mail.
 c) There is a high possibility that e-mail delivered late is falsified on the way.
 d) The arrival sequence is subject to change because of different transfer routes.

Q32. Which of the following is an appropriate description concerning cryptography?

- a) The process of turning the encrypted text back into its original plain text is called reset.
- b) In common key cryptography, the encrypted text and common key are transmitted together.
- c) In public key cryptography, the key used for encryption is different from that for recovering the plain text from the encrypted text.
- d) Common key cryptography is used for digital signature.

Q33. Which of the following can be made possible by using a digital signature in electronic commerce?

- a) Preventing an unintended third party from accessing any confidential file
- b) Checking that a file is not infected with a virus
- c) Preventing the contents of a transaction from being leaked through wiretapping
- d) Authenticating the trading partner and checking that the contents of a transaction are not falsified

Q34. Which of the following is the purpose of a DoS attack against a server?

- a) Takeover of server administrator's privileges
- b) Blocking of services
- c) Falsification of data
- d) Stealing of data

Q35. Which of the following is the self-propagating program that can send its replication attached to an e-mail message via a network, such as the Internet, or copy itself onto other computers in the network?

- a) Cookie
- b) Spyware
- c) Trojan horse
- d) Worm

Q36. Which of the following is an appropriate explanation of spam mail?

- a) E-mail that is indiscriminately sent to users without their consent
- b) E-mail that is distributed to all participants registered previously for a specific purpose
- c) E-mail that is sent or forwarded with the same content by a receiver to multiple destinations and causes the number of receivers to continue increasing
- d) A message exchange system that provides a message posting function using e-mail or Web page to enable information exchange with the general public

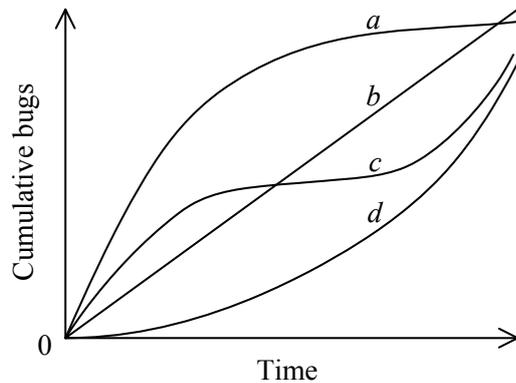
Q37. Which of the following is a security incident categorized as being caused by a physical threat?

- a) The server room is flooded because of heavy rain, which causes the equipment to stop.
- b) A large amount of data is sent from the external network to the public server, which causes the server to stop.
- c) An attacker intrudes into the corporate server over the network and destroys files.
- d) An employee makes an operational error on the computer, and data is destroyed.

Answer questions Q38 through Q57 concerning management.

- Q38.** A client application for a mission-critical business system built by the information systems department displayed an error message on the screen and stopped. Which of the following is the most appropriate action to be taken by the user in this situation?
- a) Restarting the PC and notifying the information systems department that a failure occurred
 - b) Trying to resolve the problem on one's own, based on the error message or other information
 - c) Checking the error message with the user manual and determining if the failure can be resolved on one's own, or if the information systems department should be consulted
 - d) Informing other PC-based clients on this system of the failure and asking them to stop operations in progress
- Q39.** Which of the following describes a "limit check" that is a method of checking input data?
- a) Checking the data for either the minimum or maximum value
 - b) Checking whether the data is in a certain order
 - c) Checking whether the data is logically correct
 - d) Checking the data code with the code registered in a table

Q40. A system, consisting of four subsystems *a* through *d*, is being developed. The chart below shows the cumulative number of bugs found during the test phase for each subsystem. Which subsystem can be regarded as being at the highest quality level? Here, all detected bugs have already been removed, and the development scale, development period, and the number of staff are almost the same for all subsystems.



Q41. Which of the following is an appropriate description of programming?

- a) Consolidating individual programs and verifying that the software works as specified
- b) Performing a functional decomposition of software, based on its hierarchical structure
- c) Describing procedures in accordance with the grammar of a programming language, and then verifying that there is no error in the procedures
- d) Representing the procedure of a program schematically or graphically

Q42. Which of the following is an appropriate explanation of a white box test?

- a) Test data is prepared based on external specifications.
- b) Test data is prepared by applying the equivalence partitioning technique.
- c) Test data is prepared based on internal structure.
- d) Test data is prepared by using the relationship between input and output.

Q43. Which of the following is an advantage of dividing the software development process into four phases—requirements definition, system design, programming, and testing—and then executing them in this order?

- a) It provides flexibility to handle changes in software specifications at any point of the development phases.
- b) It contributes to the ease of understanding the progress status of development.
- c) It requires fewer person-hours spent for reviews in the upstream phases.
- d) It allows users to try the software at an early stage of development.

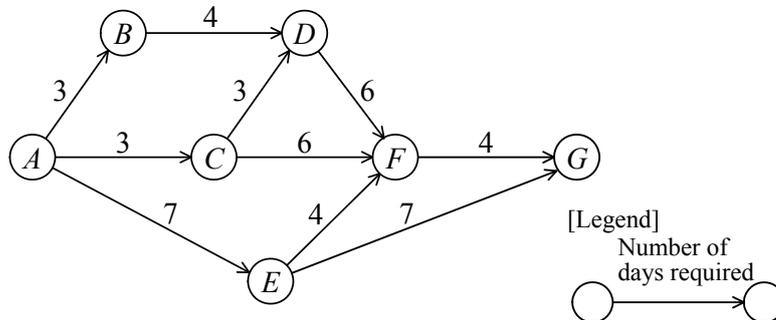
Q44. Which of the following is the development model where a trial model or a pilot unit is developed at an early stage of system development so that users can verify their requirements in a tangible manner?

- a) Waterfall model
- b) Extreme programming
- c) Spiral model
- d) Prototyping

Q45. Which of the following is the chart or diagram that is illustrated in length proportional to the time period required for each task, with time on the horizontal axis and the tasks on the vertical axis?

- a) E-R diagram
- b) Arrow diagram
- c) Gantt chart
- d) State transition diagram

Q46. In the arrow diagram below, what is the maximum number of days that can be accepted as a delay of the activity “ $C \rightarrow F$ ” on condition that the total number of days required for activities from A through G is not affected?

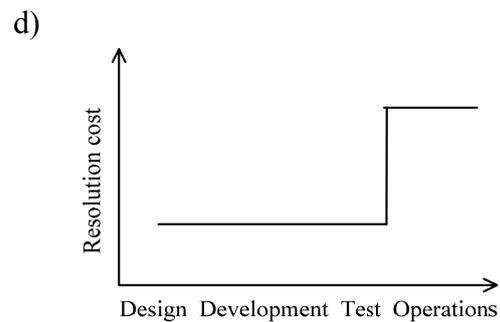
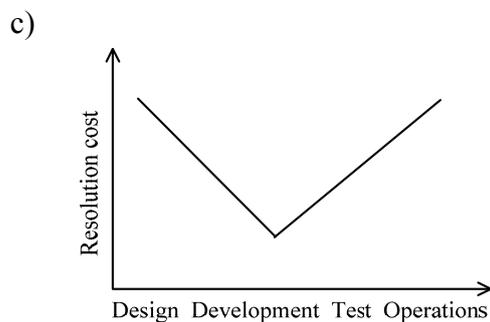
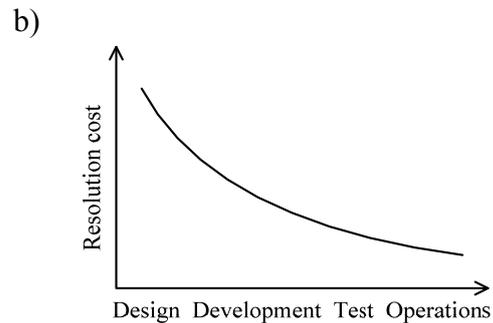
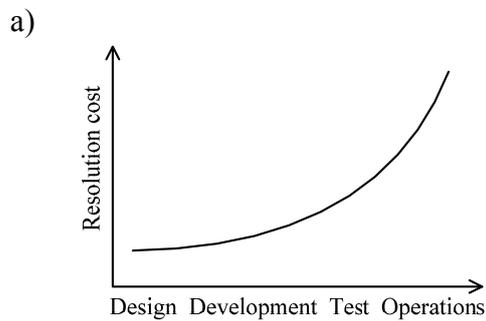


- a) 1 b) 2 c) 3 d) 4

Q47. Which of the following is the most appropriate description concerning the communication that a project manager performs with the parties involved in the project?

- a) It is decided at the start of the project what kind of report is to be created, and when, how, and to whom the report is to be presented.
- b) When the progress of the project is reported to the ordering party, the progress report created by the development staff member is used as is.
- c) Communication with members of the project team is performed orally, with the emphasis on promptness of contact.
- d) All the internal and external parties involved in the project are convened regularly to hold a meeting to check on the progress, regardless of the scale of the project.

Q48. In system development, which of the following is the most appropriate graph that shows the relationship between the phase where a defect is detected and the cost to resolve it?



Q49. In a development project, after a software integration test is completed, a system test is being conducted to check the functions of a system. According to the system test report, there are many defects in a certain program. Which of the following is the most appropriate action that the project manager should take first?

- Suspending the system test and starting all over again from the software integration test
- Increasing the staff members who test the defective program so as not to delay the progress of the test
- Re-evaluating the quality of the defective program to identify its impact on the system test
- Removing the defective program from the test target list and creating the program again

Q50. Which of the following is an appropriate characteristic of the single-step (or big bang) migration method?

- a) It requires an application that provides a connection between the new and old systems.
- b) The new and old systems are operated in parallel, and then migration to the new system is performed at a certain point in time.
- c) Problems during migration to the new system have a serious impact.
- d) Operational costs are incurred from parallel operations.

Q51. In the PDCA cycle model of ISMS, which of the following is performed as part of the “Do” phase?

- a) Correction of major nonconformity
- b) Security education
- c) Establishment of security policy
- d) Internal audit

Q52. When a service desk receives a call regarding a system failure from a user, which of the following is an appropriate response from the perspective of incident management?

- a) Giving priority to implementing a fundamental solution to the problem to prevent recurrence in preference to system recovery
- b) Giving priority to the continuity of the system user’s business and informing the user of any known workarounds first
- c) Reporting the recovery progress only to the user who called the service desk
- d) Identifying the severity and details of the failure, and then advising the user about an appropriate contact point

Q53. Which of the following is the management system which imposes the costs of system operations on user departments fairly?

- a) Consigned computing system
- b) Outsourcing system
- c) Billing system
- d) Standard cost system

Q54. In the PDCA cycle of service management, which of the following is performed in the “Act” phase?

- a) Identifying the scope and necessary resources of service management
- b) Measuring the usage of resources and monitoring the processes
- c) Setting improvement goals related to the usage of resources and improving the processes
- d) Managing the allocated resources as well as the team including the service desk and operators

Q55. Which of the following is the appropriate action to be taken to improve the environment of a department server from a viewpoint of facility management?

- a) Installing antivirus software
- b) Providing an automatic operation function, such as a scheduled backup
- c) Avoiding installing the server near to the water pipe in fear for water leakage
- d) Providing a function that encrypts information transmitted over the network

Q56. Which of the following is the appropriate description concerning a system audit that is performed as part of an internal audit for a company?

- a) System operators check whether the business operations of their department are done in accordance with rules, by using a self-inspection list.
- b) System developers check the requirements for the next system by conducting a questionnaire survey of the system users.
- c) Persons other than the systems department staff members check whether the business operations of the systems department are done in accordance with rules, by using a check sheet.
- d) Systems department staff members check whether all the information devices owned by the company are installed as stated in the master list, by taking physical inventory.

Q57. Who has a role and final responsibility to establish and maintain internal controls under a basic policy?

- a) Shareholder
- b) Auditing director
- c) Management executive
- d) Internal auditor

Answer questions Q58 through Q88 concerning strategy.

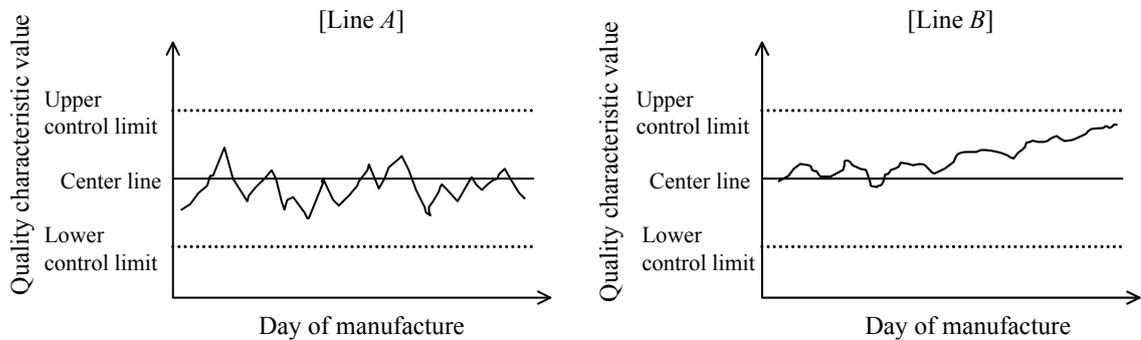
Q58. Which of the following is the most appropriate for conveying a company's belief in management and its sense of values to employees, customers, and society?

- a) Management issue
- b) Management plan
- c) Management strategy
- d) Management principle

Q59. Which of the following is an explanation of ABC analysis?

- a) Combinations of goods purchased by customers are analyzed based on the sales data collected by a POS system.
- b) A region is evenly partitioned with lines of longitude and latitude, and the population, purchasing power, and various other data for each region are collected to analyze the region in more detail.
- c) A region is partitioned into several areas for a certain purpose, and opinion leaders are selected from each area for repeated surveys on the trends and actual situation of the region.
- d) Sales or gross profits of goods are sorted in descending order, and then, according to its cumulative percentage of the total, the goods are classified into three ranks to identify hot-selling goods.

Q60. Two control charts below show the quality characteristics of products manufactured by Lines *A* and *B* in the factory for each day of manufacture. Which of the following is an appropriate response or reaction to Line *A* or Line *B* or both?



- Since the daily fluctuation of values in Line *A* is larger than in Line *B*, the cause should be investigated.
- Since values for both Lines *A* and *B* fall within the control limit range, it should be desirable to wait and see.
- Since values for both Lines *A* and *B* deviate from the center line, the cause should be investigated.
- Since the value for Line *B* continues to increase, the cause should be investigated.

Q61. Which of the following is an appropriate description concerning the usage of diagrams or charts?

- A flowchart is used to show the relationship between the capacity and access speed of a storage device.
- A Gantt chart is used to show the telephone tree for emergency calls.
- A cause and effect diagram is used to understand the reasons for the slowing of a system development project.
- An association diagram is used to show a series of procedures for purchasing stationery.

Q62. An acceptance inspection is performed on outsourced products with a non-defective probability of 0.9 and a defective probability of 0.1. The table below shows four proposed plans with each cost per non-defective product and defective product. Which of the following is the plan with the lowest expected cost?

Plan	Cost per non-defective product	Cost per defective product
<i>A</i>	0	1,500
<i>B</i>	40	1,000
<i>C</i>	80	500
<i>D</i>	120	200

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

Q63. When there are n evaluation items, n evaluation axes are drawn from the center of a circle so that the circle can be divided into n equal pieces, and then evaluation values are plotted on each axis. Which of the following is the appropriate chart or diagram that is used for determining the relative balance between evaluation items and the distance from averages by connecting neighboring plotted points with line segments?

- a) Z chart b) Scatter diagram
c) Fan chart d) Radar chart

Q64. Which of the following is a case where a Pareto chart can be effectively used?

- a) On the occasion of a new product announcement, it is used to carefully plan the arrangement of a venue, the communication with all related parties, and so on.
b) On the occasion of the design and construction of a building, it is used to investigate the procedures for carrying out multiple tasks in the shortest period of time.
c) On the occasion of establishing quality improvement measures, it is used to analyze the number of defects for each cause and select themes to be handled with high priority.
d) On the occasion of developing a sales plan for a product with a short lifecycle, it is used to prepare several alternative solutions in consideration of competitor's reactions.

Q65. Which of the following is the appropriate use of management science techniques?

- a) PERT (Program Evaluation and Review Technique) can be used to analyze the reliability of a machine.
- b) A queueing model can be used to perform financial analysis.
- c) A time series analysis can be used to forecast the sales of a product in the market.
- d) A simplex method can be used to control the quality of a product.

Q66. When corporate accounting is classified into financial accounting and management accounting, which of the following describes a characteristic of management accounting?

- a) The accounts need to be settled at the end of each accounting term, and the preparation of financial statements, such as balance sheet and income statement, is mandatory.
- b) Corporate management provides accounting reports to external stakeholders such as shareholders and creditors.
- c) Accounting procedures must be conducted in conformity with accounting regulations such as financial statement rules, corporate accounting principles, and various accounting standards.
- d) Internal reports are prepared for business judgment, including budgetary control, profit control, and performance evaluation for each department, product, region, etc.

Q67. When the results of financial statement analysis for the current period are as shown in the table below, which of the following is the cost of sales in thousands of dollars?

Cost of sales ratio	80%
Ratio of operating profit to net sales	10%
Operating profit	20,000 dollars

- a) 140 b) 160 c) 180 d) 200

Q68. In business accounting, which of the following serves as a baseline for providing financial statements, based on transactions organized in order of date and posted by account titles?

- a) Trial balance
- b) Journal book
- c) Work sheet
- d) General ledger

Q69. For the year-end settlement of accounts, an income statement was prepared as shown in the table below. How much is the operating income in thousands of dollars for the period under review?

Unit: thousands of dollars

Item	Amount
Sales	1,500
Cost of sales	1,000
Selling, general and administration expenses	200
Non-operating income	40
Non-operating expenses	30

- a) 270
- b) 300
- c) 310
- d) 500

Q70. Which of the following is an action that is compliant with the copyright law even if it is done without the consent of the copyright holder?

- a) Copying tunes from a purchased CD to one's own PC and listening to those tunes on the PC every day
- b) Making the tunes in a purchased CD downloadable from one's homepage
- c) Distributing to one's customers a copy of a magazine which has an article on a product of one's company
- d) Uploading a recorded TV drama to a video sharing site

Q71. Which of the following is the most appropriate activity based on CSR (Corporate Social Responsibility)?

- a) Providing products that require less material used and also consume less electricity
- b) Providing products differentiated from competitors' products by adding new functions
- c) Providing products that meet various market needs by adopting a cell production system
- d) Providing products that the company did not offer, by acquiring other companies

Q72. Which of the following is the purpose of strengthening compliance in corporate management?

- a) To prevent corporate management and employees from being involved in misconduct or scandals that may threaten the continued existence of the company
- b) To retain management resources for differentiation from competitors and thereby gain a competitive edge
- c) To curb the exercise of the management powers and thereby build a framework for sound management
- d) To improve the satisfaction of stakeholders including customers, shareholders, and employees in order to achieve the company's continued growth

Q73. Which of the following corresponds to a third-party audit defined in "ISO 9000:2005 Quality management system—Fundamentals and vocabulary"?

- a) A parent company audits the quality management system of a subsidiary company.
- b) A customer audits the quality management system of a trading partner company.
- c) A company audits its own quality management system for internal purposes.
- d) A certification body audits the quality management system of a client company.

Q74. In the BSC (Balanced Score Card) of a consumer products manufacturer, which of the following is the most appropriate performance evaluation indicator or index from the customer viewpoint?

- a) Development efficiency
- b) Cash flow
- c) Market share
- d) Number of patents granted

Q75. Which of the following is an explanation of core competence management?

- a) Acquiring management resources from other companies that have an established business operation, so as to gain an advantage over the competitors
- b) Optimizing the combination of business operations so that it can have a greater effect than merely operating each business independently
- c) Concentrating the management resources on proprietary know-how and technology that are not easy for other companies to imitate, so as to establish a competitive advantage
- d) Reviewing best practices (successful case stories) of other companies, so as to fundamentally improve and restructure the current business processes

Q76. Which of the following is an explanation of the just-in-time production method?

- a) The entire production process is performed by one or a few workers.
- b) The production process is started after a customer order is accepted.
- c) Products are manufactured based on the demand forecast made at the time of starting the production.
- d) Only the necessary items are produced, in the necessary quantity at the necessary time.

Q77. Which of the following is the corporate strategy to avoid excessive competition and gain a competitive advantage by focusing on a small market segment where the customer needs are not being fulfilled?

- a) Niche strategy
- b) Push strategy
- c) Brand strategy
- d) Pull strategy

Q78. Which of the following is the most appropriate description concerning the advantageous effects of implementing CRM?

- a) It becomes easy to understand customer payment status of account receivables.
- b) It becomes easy to reduce the lead time from a customer order placement to its delivery.
- c) It becomes easy to share sales approach to customers among the entire sales staff.
- d) It becomes easy to clearly understand customer needs and requests, and thereby to build up long-term relationships with customers.

Q79. Which of the following corresponds to information barrier-free?

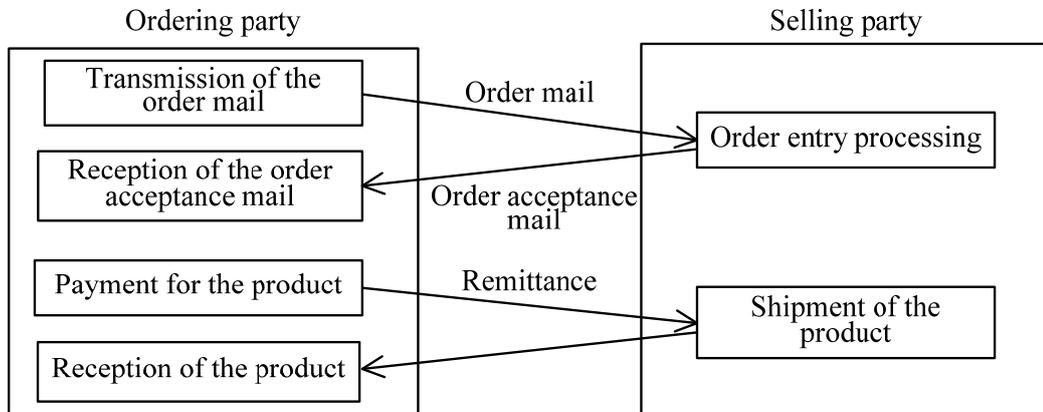
- a) An environment in which information devices can be utilized practically, even when the data entry method is limited to only voice, handwriting, etc.
- b) An environment in which a user in motion can utilize a communication terminal such as a cell phone and a smartphone
- c) An environment in which a working style without time loss and emotional distress because of commuting is made possible through the use of information communication technology
- d) An environment in which individuals can utilize computers seamlessly by means such as mobile computing and home networks

Q80. Which of the following is a method where tasks are performed according to the steps (1) through (3)?

- (1) Calculate the necessary quantities of the components, based on the types, quantity, and component list for products planned to be produced in a certain period of time.
- (2) Calculate the actual ordering quantity for each component, in consideration of the quantity in stock available for allocation.
- (3) Determine the reorder timing for each component, in consideration of the lead time for manufacturing or procurement or both.

- a) CAD b) ERP c) JIT d) MRP

Q81. When online shopping via the Internet is done according to the procedure shown in the figure below, at which of the following points does the transaction take effect unless otherwise specified?



- a) Transmission of the order mail
- b) Order entry processing
- c) Reception of the order acceptance mail
- d) Payment for the product

Q82. Which of the following is the most appropriate characteristic of embedded systems?

- a) A dedicated OS is used for the development and operation of embedded systems.
- b) A connection to a network is required for embedded systems to operate.
- c) Embedded systems are used for internal control of equipment, so they do not require user interface.
- d) Embedded systems are composed of dedicated or specially-designed hardware and software.

Q83. Which of the following is the appropriate explanation of the DFD that is created when a business process is analyzed?

- a) It shows various types of data items handled in the business operations and the interrelations among them.
- b) It shows various types of data items handled in the business operations, from sets to elements in a hierarchically detailed fashion.
- c) It shows the processes that make up the business operations and the data flow exchanged among them.
- d) It shows the contents of the processes that make up the business operations, from overviews to details in a hierarchical fashion.

Q84. Which of the following is a technique used for analyzing structures of data used for business operations and depicting the relationship between extracted entities in diagrams such as an E-R diagram?

- a) Data cleaning
- b) Data cleansing
- c) Data mining
- d) Data modeling

Q85. Which of the following is the profitable combination of system development projects *A*, *B*, and *C*? Here, the profitability of a project is examined during the first five years after the system starts its service, and the maintenance cost of the system equivalent to 10% of the initial investment amount is incurred every year after the start of the service.

Unit: thousands of dollars

System development project	Initial investment amount	System effect per year
<i>A</i>	250	80
<i>B</i>	450	140
<i>C</i>	700	200

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

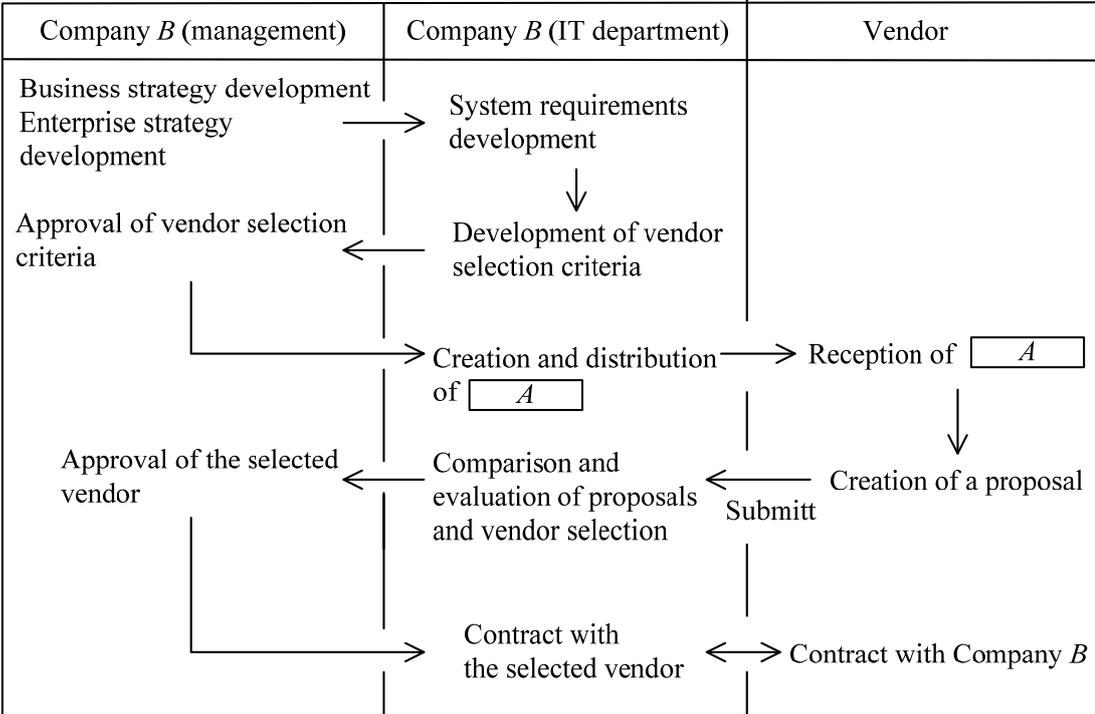
Q86. Which of the following is an explanation of housing services?

- a) A service in which a service provider provides business software via the Internet
- b) A service in which a service provider performs planning, development, operations, management, and maintenance of information systems owned by other companies
- c) A service in which a service provider lends out servers and communication equipment installed in the provider's own buildings to users
- d) A service in which a service provider operates customer's servers and communication equipment installed in the provider's own buildings

Q87. On January 1, 2009 which was the first day of the fiscal year, a company bought an air conditioner for the office at 6,000 dollars. How much was its book value in dollars on December 31, 2010? Here, the service life is six years, the yearly depreciation is computed using the straight-line method, and the residual value after six years is 10%.

- a) 3,600
- b) 4,000
- c) 4,200
- d) 5,100

Q88. When Company *B* procures an information system according to the flow shown in the figure below, which of the following is the term to be inserted in blank *A*?



- a) NDA
- b) RFI
- c) RFP
- d) SLA

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

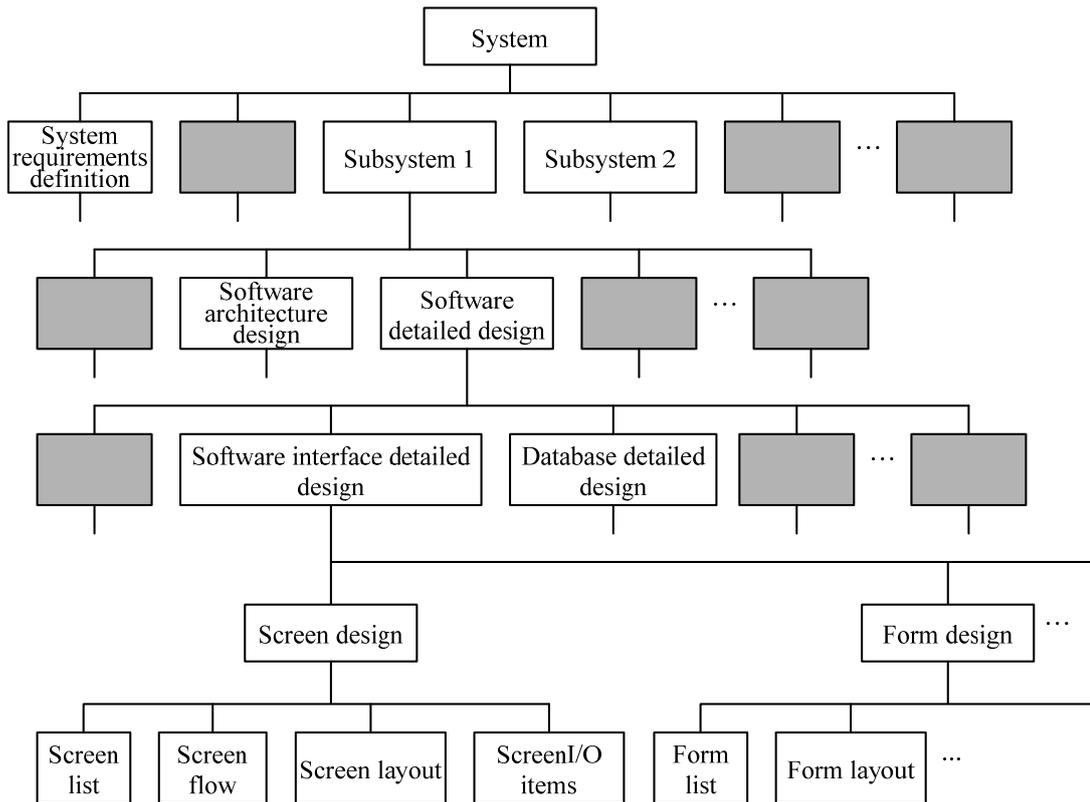
Question A Read the following description concerning the development plan for an inventory control system, and then answer Q89 through Q92.

Mr. *S* participates in a project for constructing an inventory control system (hereinafter called the system).

After the deliverables and completion criteria for the project are identified, the development plan for the system is divided into five steps—activity breakdown, activity definition, activity sequencing, activity duration estimating, and schedule development—and these steps are performed sequentially.

- (1) In activity breakdown, the activities involved in creating deliverables are broken down into smaller components by using the WBS (Work Breakdown Structure). In other words, the WBS is used for breaking down all the activities into components and organizing these components into a hierarchical structure.
- (2) In activity definition, the deliverables and person-days of each broken down activity are defined.
- (3) In activity sequencing, the time sequence of activities is determined.
- (4) In activity duration estimating, the duration of each activity is obtained by dividing the person-days of each activity by the number of staff members.
- (5) In schedule development, the start and finish dates are determined based on the duration of each activity.

Under the supervision of the senior staff member, Mr. *S* performs activity breakdown for the system by using the WBS shown in the figure below.



Note: Shaded parts are not shown.

Fig. Activity breakdown for the system by using the WBS

[Management]

Q89. Mr. *S* is instructed by the senior staff member to ensure that the activities that concern the entire work of system development, such as system requirements definition, are listed at the same hierarchical level as Subsystems 1, 2, and so on in the figure of activity breakdown. Which of the following is appropriate as an activity that should be listed at the same hierarchical level as system requirements definition in the figure?

- a) System audit
- b) System integration
- c) Software integration
- d) Software coding and testing

[Management]

Q90. In the figure of activity breakdown, the activities are broken down at the first level, with the focus on those that concern the entire work of system development and subsystems. Which of the following is the appropriate explanation concerning the activity breakdown that Mr. *S* performs at the next lower level for each subsystem in the figure?

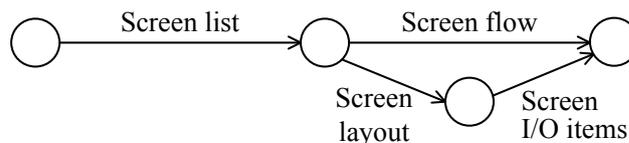
- a) Mr. *S* breaks down the activities for each phase or process of development.
- b) Mr. *S* breaks down the activities for each item of system requirements definition.
- c) Mr. *S* breaks down the activities for each type of software.
- d) Mr. *S* breaks down the activities for each module.

[Management]

Q91. In activity definition, a table is created by adding the staff members in charge and person-days, based on the WBS created in activity breakdown. The table below shows part of the entire table. When the time sequence shown in the diagram below exists among the activity items of Activity 5 for screen design, how many person-days are necessary for the critical path of screen design? In the diagram, the flow of activities is represented by arrows, and activity names are shown above or below the arrows.

Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Deliverable	Staff in charge	Person-days
Sub-system 1	Software detailed design	Software interface detailed design	Screen design	Screen list	Screen list table	Smith	4
				Screen flow	Screen flow diagram	Smith	6
				Screen layout	Screen layout diagram	Johnson	3
				Screen I/O items	Screen I/O items definition document	Johnson	2
			Form design	Form list	Form list table	Nelson	5
				Form layout	Form layout diagram	Nelson Smith	10

Note: No staff member has the same name.



- a) 5
- b) 9
- c) 10
- d) 15

[Management]

Q92. Mr. *S* performs “activity duration estimating” and develops a schedule by determining the start and finish dates of the individual activities, based on their durations. The table below shows part of the schedule. The senior staff member checks the schedule and points out a mistake. Which of the following is appropriate as the mistake pointed out to Mr. *S*? The calendar for June is shown below the table. No activity is done on Saturdays and Sundays.

Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Deliverable	Staff in charge	Person-days	Activity	
								Start date	Finish date
Sub-system 1	Software detailed design	Software interface detailed design	Screen design	Screen list	Screen list table	Smith	4	June 3	
				Screen flow	Screen flow diagram	Smith	6	June 9	
				Screen layout	Screen layout diagram	Johnson	3	June 9	
				Screen I/O items	Screen I/O items definition document	Johnson	2	June 12	
			Form design	Form list	Form list table	Nelson	5	June 6	
				Form layout	Form layout diagram	Nelson Smith	10	June 13	June 19

Note: No staff member has the same name. Shaded areas are not shown.

June						
Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

- Since the person-days for form layout are 10, the finish date is June 26.
- Since Mr. Smith’s activity of form layout overlaps his preceding activity, the finish date cannot be set to June 19.
- Since two staff members are assigned to the activity of form layout, the finish date can be set to June 18.
- Since the activity of form layout requires more person-days than the other activities, its activity duration should be estimated to be longer.

Question B Read the following description concerning the task of managing the loan-out of documents, and then answer Q93 through Q96.

The data room of Company *A*'s laboratory is engaged in the task of managing the loan-out of documents. A document loan-out management system (hereinafter called the document system) that utilizes PC-based database software is used for the task of managing the loan-out of documents.

The database structure of the document system is as follows:

Employee table

Emp_No	Emp_name	E-mail_address
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Document table

Doc_No	Doc_title
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Loan-out table

Doc_No	Doc_title	Emp_No	Emp_name	E-mail_address	Loan-out_date	Return_date
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Note: "Doc_No" stands for document number, "Doc_title" for document title, "Emp_No" for employee number, and "Emp_name" for employee name.

The conditions concerning the documents held and the loan-out of documents are as follows:

[Conditions concerning the documents held and the loan-out]

- (1) Only one copy of the same document is held, and a unique document number is assigned to each document.
- (2) The maximum loan-out period is two weeks including the day on which the document is loaned out. A document returned by an employee may be loaned out to another employee on the day the document is returned, but a returned document is not loaned out to the same employee on the day it is returned.

The procedure from loan-out to return is as follows:

[Procedure from loan-out to return]

- (1) An employee takes out the document that he or she wants to borrow from the library, hands it to the staff member in charge of the data room (hereinafter called the staff member), and shows his or her employee number to the staff member.
- (2) The staff member performs the loan-out process by using the document system and hands over the document to the employee.
- (3) When the employee returns the document, he or she hands it to the staff member, who in turn performs the return process by using the document system.

The specifications for the loan-out process and return process in the document system are as follows:

[Loan-out process]

- (1) The document table is searched by using “Doc_No” to obtain “Doc_title”.
- (2) The employee table is searched by using “Emp_No” to obtain “Emp_name” and “E-mail_address”.
- (3) A record (hereinafter called the loan-out record) for the loan-out table is prepared, and “Doc_No”, “Doc_title”, “Emp_No”, “Emp_name”, and “E-mail_address” obtained in (1) and (2) are set. The current date is set as “Loan-out_date”, and a null value is set as “Return_date”.
- (4) The loan-out record set in (3) is added to the loan-out table.

[Return process]

- (1) The loan-out table is searched by using “Doc_No” to retrieve the loan-out record that has a null value as “Return_date”.
- (2) The current date is set as “Return_date” of the retrieved loan-out record, and the loan-out table is updated.

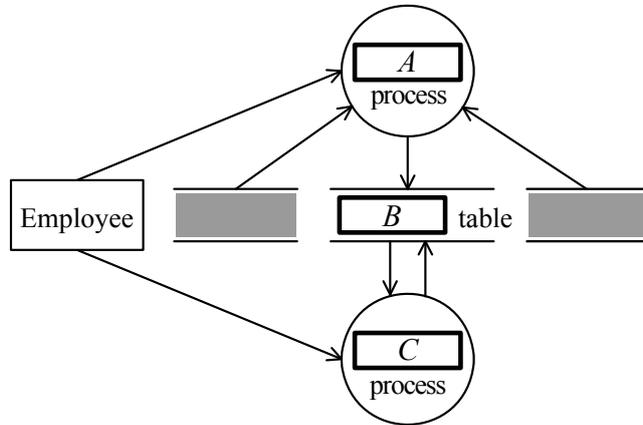
[Technology]

Q93. Which of the following is the appropriate description concerning the database structure of the document system? Here, a primary key is a field or combination of fields that uniquely identifies each record in a table.

- a) The primary key of the loan-out table is the combination of “Doc_No” and “Emp_No”.
- b) The primary key of the loan-out table is the combination of “Doc_No”, “Emp_No”, and “Loan-out_date”.
- c) The primary key of the employee table and loan-out table is “Emp_No”.
- d) The primary key of the document table and loan-out table is “Doc_No”.

[Strategy]

Q94. The DFD shown below is created based on [Loan-out process] and [Return process] for the document system. Which of the following is the appropriate combination of the terms to be inserted in blanks *A* through *C* in the DFD?



Note: Shaded areas are not shown.

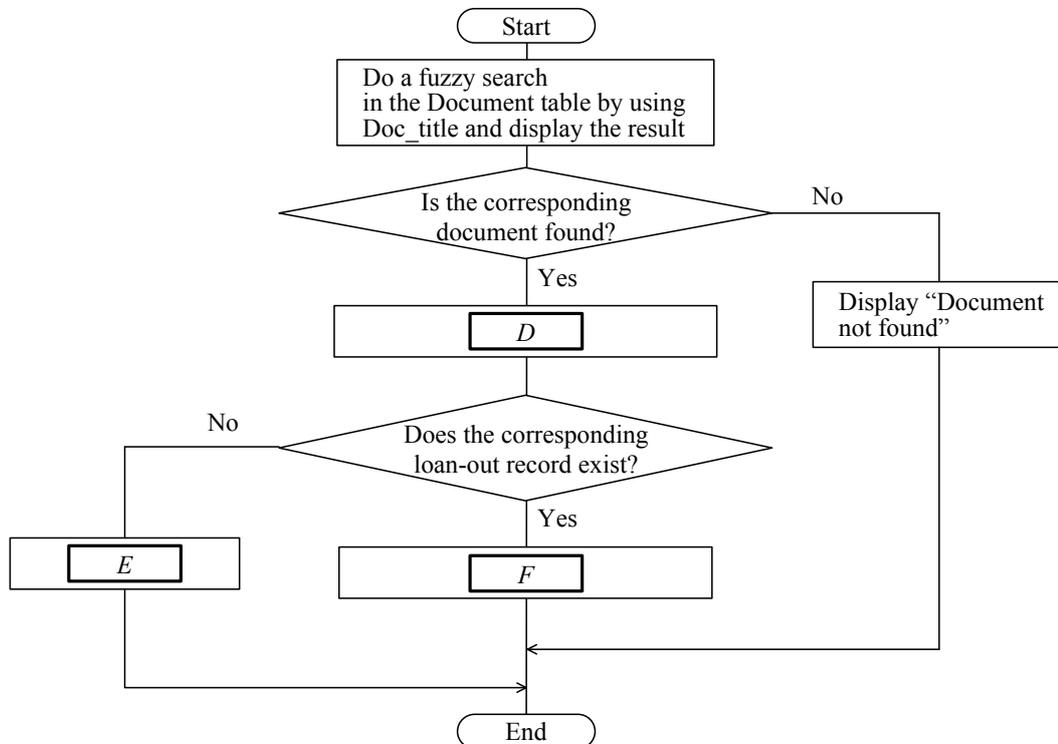
	<i>A</i>	<i>B</i>	<i>C</i>
a)	Loan-out	Loan-out	Return
b)	Loan-out	Document	Return
c)	Return	Loan-out	Loan-out
d)	Return	Document	Loan-out

[Technology]

Q95. The staff member receives many queries about documents from employees. The staff member hears a document title from an employee over the phone and checks whether the document is available for loan-out. Therefore, a decision is to be made to add a document search function to the document system and let employees use the function. An outline of the document search function is given below. The flow of processing related to the document search function to be added is summarized in the figure below. Which of the following is the appropriate combination of the phrases to be inserted in blanks *D* through *F* in the figure?

[Outline of the document search function]

- (1) The function does a fuzzy search in the document table by using the queried “Doc_title” and displays the result.
- (2) The function checks whether the corresponding document exists and, if the document exists, determines whether it is available for loan-out. If the loan-out record is found with a null “Return_date”, the corresponding document is out on loan.
- (3) The function displays whether the document is currently out on loan or available for loan-out.



- (i) Display “Available for loan-out”
- (ii) Display “Out on loan”
- (iii) Search the loan-out table by using “Doc_No”, and retrieve the loan-out record that has a null value as “Return_date”
- (iv) Search the loan-out table by using “Doc_No”, and retrieve the loan-out record that has the oldest “Loan-out_date”

	<i>D</i>	<i>E</i>	<i>F</i>
a)	(iii)	(i)	(ii)
b)	(iii)	(ii)	(i)
c)	(iv)	(i)	(ii)
d)	(iv)	(ii)	(i)

[Technology]

Q96. An investigation is done to contact the employees who have not returned documents within two weeks including the loan-out date. Which of the following is the appropriate method of retrieving these employees?

- a) Retrieving the records whose “Loan-out_date” in the loan-out table is a null value and whose “Return_date” is within two weeks from the investigation date
- b) Retrieving the records whose “Loan-out_date” in the loan-out table is two weeks ago from the investigation date or earlier
- c) Retrieving the records whose “Return_date” in the loan-out table is a null value and whose “Loan-out_date” is two weeks ago from the investigation date or earlier
- d) Retrieving the records whose “Return_date” in the loan-out table is a null value

Question C Read the following description concerning enterprise strategy planning, and then answer Q97 through Q100.

The planning department of Company *S*, a health food maker, is planning a strategy for the healthy confectionery business. The department has recognized the company's situation by classifying it into strengths, weaknesses, opportunities, and threats through SWOT analysis, considered the strategy to be adopted, and then created two draft policies.

The situation of Company *S* and an outline of the draft policies are as follows:

[Situation of Company *S*]

- (1) The company has fewer business sites than competitors do.
- (2) Company *T*, a competitor, has decided to withdraw from the healthy confectionery business.
- (3) The company has greater product planning ability than that of competitors.
- (4) A growing fitness trend is generating higher interest in healthy food.
- (5) The company's factory is getting old.
- (6) The number of children is decreasing because of the declining birthrate.
- (7) Consumers are becoming more conscious about the safety of food.
- (8) The company has gathered customer information by having customers enroll as members and succeeded in including rich people in its membership as well.

[Outline of the draft policies]

Draft policy 1: Company *S* will improve its information system to further develop its strengths.

Draft policy 2: Company *S* will acquire the business from which Company *T* withdraws, in order to expand its own business.

The market shares that individual companies have maintained in healthy confectionery over the several past years are 25% for Company *Q*, 16% for Company *R*, 12% for Company *S*, 10% for Company *T*, and 37% for others.

[Strategy]

Q97. [Situation of Company *S*] is summarized as shown in the table below. When (1) and (2) in [Situation of Company *S*] are categorized into cells *A* through *D* in the table, which of the following is the appropriate combination?

	Advantage	Disadvantage
Internal environment	<i>A</i>	<i>B</i>
External environment	<i>C</i>	<i>D</i>

	Cell into which (1) is categorized	Cell into which (2) is categorized
a)	<i>B</i>	<i>C</i>
b)	<i>B</i>	<i>D</i>
c)	<i>D</i>	<i>C</i>
d)	<i>D</i>	<i>D</i>

[Strategy]

Q98. Among the items in [Situation of Company *S*], which of the following is the appropriate combination of the items that can be categorized as strengths?

- a) (1) and (5) b) (2) and (4) c) (3) and (8) d) (6) and (7)

[Strategy]

Q99. Which of the following is the appropriate description concerning the measure to further develop the company's strengths according to draft policy 1?

- a) Introducing an Internet online shopping system that is little affected by the number of business sites
- b) Constructing a CRM system to analyze purchase data of customers and provide members with well tailored services
- c) Renovating the production management system in order to ensure thorough safety control in the production process of products
- d) Introducing a POS system with the aim of analyzing statistical data concerning the population distribution of each region when a plan is created for healthy confectionery targeted at adults

[Strategy]

Q100. When draft policy 2 is carried forward, the company can respond to (1) and (5) in [Situation of Company *S*], and is expected to secure almost all the market share held by Company *T*. When one of the strategies shown in the table below is adopted based on the market share, which of the following is the appropriate description concerning the strategy that Company *S* adopts after the acquisition of Company *T*?

Market share	Strategy to adopt
Company ranked first in market share	Expand the scale of the entire market
Company ranked second in market share	Attack competitors by taking advantage of its strengths
Company ranked third or lower in market share but having the largest market share for a specific product	Adapt to specific needs
Other than the above	Cut costs through imitation

- a) Creating a healthy confectionery product similar to the popular product of Company *Q*, and selling the product at a price lower than Company *Q*'s product
- b) Specializing in producing allergy-free healthy confectionery, and aiming to provide high-price, high-profit products
- c) Promoting the fitness trend among people through advertising and other means, and increasing the demand itself for healthy confectionery
- d) Investing funds in the departments related to product planning, and planning and selling highly competitive and superior products

Spreadsheet Software Functions and Terminology

The following defines the basic functions and terminologies of spreadsheet software.

1. Worksheets

Worksheet is the work area within spreadsheet software. A worksheet has 256 columns (columns A through Z, followed by AA through AZ, then BA through BZ, up to column IV) and 10,000 rows (row 1 through row 10,000).

2. Cells

(1) An intersection of a column (vertical) and a row (horizontal) on a worksheet is called a cell. The cell at Column A and Row 1 is represented as A1.

(2) A group of cells that form a rectangular shape can be selected as a range. A range is represented, for example, as "A1:B3".

(3) A name can be assigned to any range. A name is assigned to a range by using [] (square brackets), for example, "the range of cells 'A1:B3' is named [Price]."

(4) A cell that contains no data is called a blank cell.

3. Cell data entry

(1) Numeric values, character strings, and expressions can be entered to a cell.

(2) Cells can be protected to prevent data entry. When cell protection is turned off, data entry is allowed again.

(3) The entry of a numeric value 5 into cell A1 is represented as "Enter 5 into cell A1."

(4) The entry of a character string ABC into cell B2 is represented as "Enter 'ABC' into cell B2."

(5) The entry of an expression for the sum of cell A1 and cell B2 into cell C3 is represented as "Enter the expression 'A1+B2' into cell C3."

4. Cell display format

(1) A numeric value in a cell is displayed right justified.

(2) A character string in a cell is displayed left justified.

(3) An expression in a cell is displayed left justified if the result is numeric, and right justified if the result is a character string.

(4) The display format for each cell can be changed to left justified, centered, or right justified.

5. Calculating formula

(1) Mathematical expressions can be used in calculating formula.

(2) Arithmetic operators available for use in a calculating formula include "+" (addition), "-" (subtraction), "*" (multiplication), "/" (division), and "^" (exponentiation).

(3) The arithmetic operators are processed according to the standard order of mathematical precedence.

6. Recalculation

(1) When a calculating formula is entered into a cell, the calculation result is displayed immediately.

- (2) When the value of a cell changes, values of other cells that refer to that cell will be automatically recalculated. This recalculation is performed only once, in the sequence A1, A2, A3, ..., B1, B2, B3, ..., and so on.

7. Functions

- (1) The functions defined in the table below are available for use in a calculating formula.

Function name and example	Description
SUM (A1:A5)	Calculates the sum of the values in cells A1 through A5.
AVERAGE (B2:F2)	Calculates the average of the values in cells B2 through F2.
SQUAREROOT (I6)	Calculates the positive square root of the value in cell I6 (which must be a positive value).
STANDARDDEVIATION (D5:D19)	Calculates the standard deviation of the values in cells D5 through D19.
MAX (C3:E7)	Returns the largest value from the values in cells C3 through E7.
MIN ([Score])	Returns the smallest value from the values within the range called [Score].
IF (B3>A4, 'Chicago', 'Washington')	Returns the second argument if the logical expression specified in the first argument is TRUE (valid), or the third argument if FALSE (invalid). In the example on the left, if the value in cell B3 is greater than the value in cell A4, the character string 'Chicago' is returned. Otherwise, 'Washington' is returned. In logical expressions, comparison operators =, ≠, >, <, ≤, ≥ can be used. "IF" functions can be specified as the second or the third arguments to construct a nested "IF" function.
COUNT (G1:G5)	Counts the number of non-blank cells in cells G1 through G5.
COUNTIF (H5:H9, '>25')	Counts the number of cells within the range specified in the first argument that meet the condition specified in the second argument. In the example on the left, in cells H5 through H9, the number of cells that contain a value greater than 25 is returned.
INTEGER (A3)	Calculates the maximum integer that does not exceed the number in cell A3 (must be a numeric number). Example: INTEGER (3.9) = 3 INTEGER (-3.9) = -4

MODULO (C4, D4)	Calculates the remainder after the value in cell C4 (dividend) is divided by the value in cell D4 (divisor). The result will always have the same sign as the divisor. MODULO and INTEGER functions satisfy the following relationship: $\text{MODULO}(x, y) = x - y * \text{INTEGER}(x/y)$
AND (Logical expression 1, Logical expression 2, ...)	Returns TRUE if all the logical expressions specified as arguments evaluate to TRUE. Returns FALSE if any one arguments is FALSE. Any number of logical expressions can be specified as arguments.
OR (Logical expression 1, Logical expression 2, ...)	Returns FALSE if all logical expressions specified as arguments evaluate to FALSE. Returns TRUE if any one of the logical expressions is TRUE. Any number of logical expressions can be specified as arguments.
NOT (Logical expression)	Returns TRUE if the logical expression specified as the argument evaluates to FALSE, and returns FALSE if the argument evaluates to TRUE.
Note : SUM, AVERAGE, STANDARDDEVIATION, MAX, and MIN functions ignore cells that are within the specified range but do not contain a numeric value.	

- (2) An argument of a function can be specified using a calculation formula that uses cells, a range, a range name, or a logical expression.

8. Copying of cells

- (1) A numeric value, character string, or expression entered into a cell can be copied into other cells.
- (2) If an expression referring to another cell is copied, the copied expression will be changed automatically based on relative reference. For example, when the function SUM (A1:A5) in cell A6 is copied to cell B7, cell B7 will contain the expression SUM (B2:B6).

9. Absolute references

- (1) A reference that is not changed even when an expression is copied into another cell is called absolute reference, and is represented using the \$ (dollar) symbol, as in \$A\$1. For example, when an expression \$A\$1+5 in cell B1 is copied into cell C4, the expression in cell C4 will remain as \$A\$1+5.
- (2) A mixed reference is also possible, where either the column or the row is an absolute reference, as in \$A1 and A\$1. For example, when the expression \$C1-3 in cell D2 is copied into cell E3, cell E3 contains the expression \$C2-3. Likewise, when the expression F\$2-3 in cell G3 is copied into cell H4, cell H4 contains the expression G\$2-3.

10. Macros

- (1) Macros can be stored within a spreadsheet. Macros are represented as Macro *P*, Macro *Q*, and so on.
- (2) Some examples of instructions concerning macros are as follows: “Run Macro *P* to save the spreadsheet,” “Register the procedure for sorting cells A1 through A10 in ascending order as

Macro *Q*,” “Macro *R*: enter numeric values,” and “Extract records for which the data in Column C is less than the specified value.”

11. Others

The spreadsheet software shall be equipped with the same functions as most commercially-available spreadsheet software, including the grid line and graph/chart functions in addition to “Save”, “Read”, and “Print”.