



October 2014

## Fundamental IT Engineer Examination (Morning)

Questions must be answered in accordance with the following:

Question Nos.	Q1 - Q80
Question Selection	All questions are compulsory.
Examination Time	9:30 - 12:00 (150 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 Fundamental IT Engineer 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]

<b>Q1</b>	<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.**










## **Symbols commonly used in questions**

Unless otherwise noted in each question, the following notational conventions are applied as shown in the tables.

### **I. Standards**

<b>Notation in the exam questions</b>	<b>Name of the standard</b>
ISO 9001	ISO 9001:2008
ISO 14001	ISO 14001:2004
ISO/IEC 20000-1	ISO/IEC 20000-1:2011
ISO/IEC 20000-2	ISO/IEC 20000-2:2012
ISO/IEC 25010	ISO/IEC25010:2013
ISO/IEC 27001	ISO/IEC 27001:2005
ISO/IEC 27002	ISO/IEC 27002:2013
ISO/IEC 12207	ISO/IEC 12207:2008
ISO 21500	ISO 21500:2012
ITIL	ITIL 2011 edition
PMBOK	PMBOK Guide – Fifth Edition

## II. Logic Circuit

Graphic symbol	Explanation
	AND gate
	NAND gate
	OR gate
	NOR gate
	Exclusive OR (XOR) gate
	Exclusive NOR gate
	Buffer
	NOT gate
	Three-state buffer (or tri-state buffer)

Note: The small circle or “bubble” on either the input or output terminal shows inversion or negation of the logic state.

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.

**Q1.** When a total of 400 data records are stored in contiguous memory starting from the address  $0274_8$ , which of the following is the address where the last data record is stored? Here, each data record occupies one address location, and each address is represented in radix notation.

- a)  $0673_8$                       b)  $0674_8$                       c)  $1113_8$                       d)  $1114_8$

**Q2.** As shown in the table below, 100 out of 100,000 patients have a cancer. When a cancer screening test has an accuracy of 99% for patients with a cancer and an accuracy of 96% for patients without a cancer, the equations below hold for  $A$ ,  $B$ ,  $C$ , and  $D$ .

$$\frac{A}{A+B} \times 100 = 99 \qquad \frac{D}{C+D} \times 100 = 96$$

Which of the following is the probability (in percentage) that a patient with a positive test result has a cancer?

	Number of patients with a positive test result	Number of patients with a negative test result	Total
Patients with a cancer	$A$	$B$	100
Patients without a cancer	$C$	$D$	99,900
Total	$A + C$	$B + D$	100,000

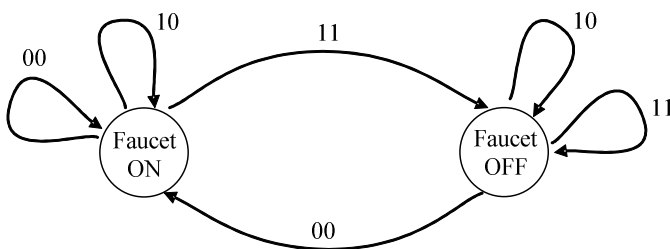
- a) 0.001                      b) 2.418                      c) 97.582                      d) 99.999

**Q3.** When the word list of a dictionary is searched for an exact matching word, which of the following is the most appropriate data structure in terms of runtime computational complexity?

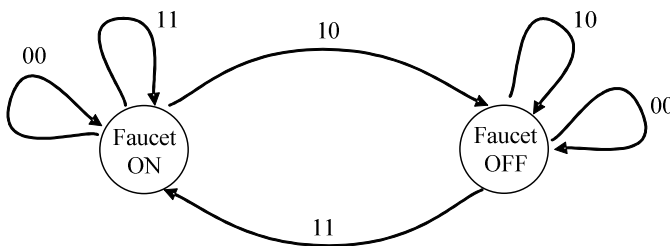
- a) Array    b) Binary search tree  
c) Hash table                                      d) Linked list

- Q4.** There is a water tank that is equipped with a faucet to fill the tank with water and two sensors (S1 and S2) to control the faucet. S1 and S2 are used to check the lower and upper limits respectively. If the water level in the tank is lower than the specified limit, the sensor indicates 0. Otherwise, the sensor indicates 1. In order to keep the water level between the lower limit and the upper limit, the faucet is opened (i.e., ON) or closed (i.e., OFF), on the basis of the signals of S1 and S2. Which of the following is an appropriate state transition diagram that shows such a situation? Here, in the diagram, the left and right bits of the 2-bit input data indicate the signals from S1 and S2 respectively.

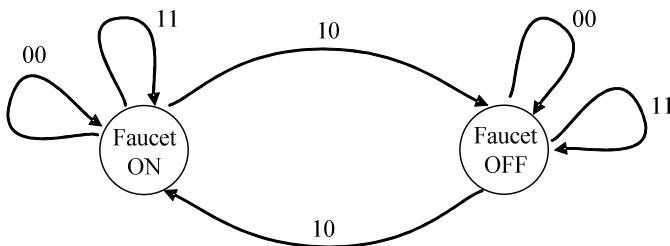
a)



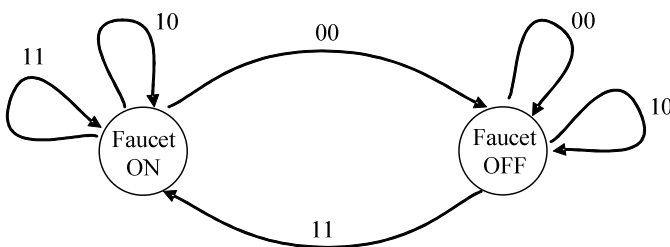
b)



c)



d)



**Q5.** For the post-order traversal of a binary search tree where the left and right subtrees of the root node contain 1000 and 100 nodes respectively, which of the following is the number of nodes that are processed before the root node is visited?

- a) 0                      b) 100                      c) 1000                      d) 1100

**Q6.** When the procedure shown below is executed in listed order, what is stored in variable  $y$ ? Here, the stack and queue structures are initially empty, and four types of operations are defined as shown below.

[Operations]

- push ( $x$ ): Put value  $x$  in the stack.  
pop ( ): Retrieve the value from the stack.  
enq ( $x$ ): Put value  $x$  in the queue.  
deq ( ): Retrieve the value from the queue.

[Procedure]

- enq (1)  
enq (2)  
push (3)  
push (deq ( ))  
enq (4)  
push (deq ( ))  
 $y \leftarrow \text{pop ( )}$

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

**Q7.** When the selection sort algorithm is used for sorting the dataset “2, 4, 6, 8, 10, 12, 14, 14” in descending order, how many data exchanges occur during the sorting process?

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

- Q8.** There is a circular queue implemented with a one-dimensional array of  $n$  elements. Insertion and removal of data are performed by using an array index as a pointer. Two pointers  $F$  and  $R$  are respectively used for removal and insertion. Each of the two pointers is initially zero (i.e.,  $F=R=0$ ). When the queue is empty or full, which of the following is the appropriate combination of the relations between the two pointers? Here, “ $x \bmod y$ ” represents the remainder of  $x$  divided by  $y$ .

	Full queue	Empty queue
a)	$F = R$	$F = (R + 1) \bmod n$
b)	$F = (R + 1) \bmod n$	$F = R$
c)	$F = (R + 1) \bmod n$	$R = (F + 1) \bmod n$
d)	$R = (F + 1) \bmod n$	$F = R$

- Q9.** Which of the following is a computer architecture that enables the processor to execute instructions in parallel by using hardware to dynamically allocate the arithmetic units that execute multiple instructions at the same time?

a) Pipeline                      b) Super-pipeline      c) Superscalar                      d) VLIW

- Q10.** In a paged virtual storage system, when a TLB (Translation Lookaside Buffer) is used to translate a virtual address to a physical address under the conditions shown below, how many clock cycles on average are required to translate an address through the TLB?

[Conditions]

1. It takes 1 clock cycle to translate an address at the time of a TLB hit.
2. It takes 40 clock cycles to translate an address at the time of a TLB miss hit.
3. The TLB miss rate is 0.5%.

a) 1.039                      b) 1.040                      c) 1.195                      d) 1.200

**Q11.** Which of the following is the addressing mode where the operand of an instruction is used to point to the memory address that contains the address of the data to be operated upon?

- a) Direct addressing
- b) Immediate addressing
- c) Indirect addressing
- d) Register addressing

**Q12.** Which of the following is an appropriate characteristic of Bluetooth?

- a) A maximum of 127 devices can be connected to a single host.
- b) The communication ports must be positioned in a straight line facing each other.
- c) The short range (up to about 100 m) of wireless voice/data communication is defined.
- d) The standard allows communication to be performed at a distance of 1,000 m or more.

**Q13.** Among the RAID systems, which of the following should be used in cases where maximum storage capacity is required but data redundancy or fault tolerance is not a requirement?

- a) RAID 0
- b) RAID 1
- c) RAID 5
- d) RAID 6

**Q14.** Which of the following is an appropriate explanation concerning a fault tolerant system?

- a) A system that consists of multiple processors connected through a network and shares resources located in the network
- b) A system that has a backup system at a remote location in preparation for the occurrence of a local disaster or other accident
- c) A system that is designed so that the functions required for the overall system can continue to operate even in the event of a partial failure
- d) A system that processes a single transaction in parallel by using multiple processors and verifies the results by cross-checking



**Q15.** The response speed of a database server is slowed down, even though no application is changed. As shown in the table below, the possible causes and the investigation items are considered to identify the cause. Which of the following is an appropriate investigation item that should be inserted in blank *C*?

Possible cause	Investigation item
<ul style="list-style-type: none"> <li>• An increase in load because of the coexistence of another system on the same machine</li> <li>• An increase in the amount of communication because of an increase in the number of connected clients</li> </ul>	<i>A</i>
<ul style="list-style-type: none"> <li>• The generation of SQL statements that require a large processing time because of atypical searches</li> </ul>	<i>B</i>
<ul style="list-style-type: none"> <li>• An increase in disk I/O because of fragmentation</li> </ul>	<i>C</i>
<ul style="list-style-type: none"> <li>• A lack of buffer capacity in the database</li> </ul>	<i>D</i>

- a) Confirmation of changes in external factors
- b) Identification of slow processes
- c) Investigation of the hit ratio of cache memory
- d) Verification of the status of data storage

**Q16.** The table below shows the priorities of three tasks together with the operation sequence and processing time of the CPU and I/O device when each task is executed in a stand-alone mode. What is the idle time (in milliseconds) of the CPU from the moment when all three tasks become ready to execute simultaneously until the execution of the three tasks is completed? Here, there is no I/O contention, and the overhead of the OS can be ignored. In the table, the number enclosed in parentheses shows the processing time for each operation.

Priority	Operation sequence and processing time (in milliseconds) when each task is executed in a stand-alone mode
High	CPU (3) → I/O (5) → CPU (2)
Medium	CPU (2) → I/O (6) → CPU (2)
Low	CPU (1) → I/O (5) → CPU (1)

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

**Q17.** Among the combinations of the storage management and the multiplicity of programs in a multiprogramming environment, which of the following is the combination where “thrashing” is most likely to occur?

	Storage management	Multiplicity of programs
a)	Real storage system	Large
b)	Real storage system	Small
c)	Virtual storage system	Large
d)	Virtual storage system	Small

**Q18.** Which of the following is an appropriate explanation concerning a memory leak?

- a) An increase in the number of applications executed concurrently causes excessive paging, and results in an extreme reduction of throughput.
- b) In the system with a restriction on the size of memory allocated to the running programs, each program module is loaded into main memory only when needed.
- c) Part of main memory occupied during application execution is not released because of a bug of the application or OS, and the usable space of main memory decreases.
- d) The total amount of free space available in main memory is sufficient, but no space can be used for loading a large program because of noncontiguous memory blocks.

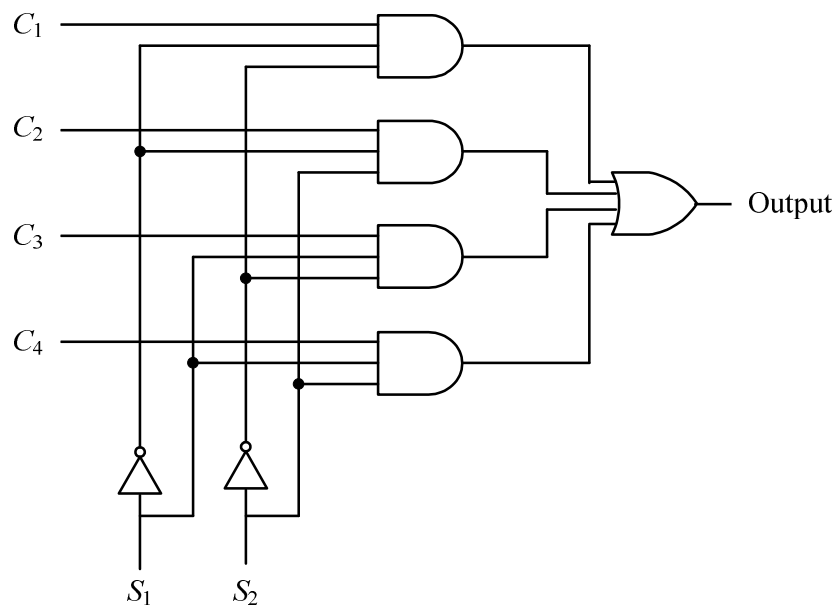
**Q19.** In a white box test, which of the following is used to evaluate the proportion of lines of code that are executed?

- a) Assertion checker
- b) Simulator
- c) Static code analysis
- d) Test coverage analysis

**Q20.** When the source code based on OSS licensed under GPL is not released to the public, which of the following is regarded as a violation of the license?

- a) A company develops and sells an interface kit between OSS and other application software.
- b) A company obtains, modifies, and sells OSS through the company's own operations or activities.
- c) A company outsources the modification of OSS to another company for the purpose of internal use.
- d) A company sells its own software whose performance test has been performed by using OSS.

**Q21.** The logic circuit shown below has four input signals ( $C_1$ ,  $C_2$ ,  $C_3$ , and  $C_4$ ) and two selector signals ( $S_1$  and  $S_2$ ). The two selectors are used to control the four input signals so that only one input signal can pass to the output port. Which of the following is an appropriate combination of the selector signals  $S_1$  and  $S_2$  that allows  $C_3$  to pass to the output port?



	$S_1$	$S_2$
a)	0	0
b)	0	1
c)	1	0
d)	1	1

**Q22.** A power supply unit has a rated output power of 500 watts and an efficiency of 80%. In order to obtain an output power of 500 watts from this power supply unit, how many watts is the minimum input power?

- a) 100                      b) 400                      c) 625                      d) 900

**Q23.** Which of the following is an appropriate description concerning flash memory?

- a) It can write data electrically and erase it all at once with ultraviolet light.
- b) It can write data electrically and erase it electrically in units of blocks.
- c) It is often used as cache memory because of the high-speed rewritable capability.
- d) It needs to rewrite (i.e., refresh) data within a given period of time.

**Q24.** A shop sells approximately 200 types of products. Among the input items for a new product on the registration screen, which of the following is the input item that is suitable for using a pull-down menu as an input method?

	Input item	Format and rules
a)	Product number	Each product number consists of five numeric characters.
b)	Product name	Each product name consists of 40 or fewer alphanumeric characters.
c)	Product category	There are five categories, and each category consists of 10 or fewer alphanumeric characters.
d)	Price	Each price has a 3- or 4-digit numeric value with a range from 100 to 1,000 dollars.

**Q25.** Which of the following is an explanation concerning the morphing technique in computer animation?

- a) A hand-drawn outline is read with a scanner, and a single particular color is applied to its enclosed area.
- b) A two-dimensional animation with a sense of depth is generated, independently of the background, by creating and superimposing multiple images with parts involving movement in descending order of distance from the viewer.
- c) In order to represent the smooth transformation in appearance from an image to another image, multiple intermediate images are created.
- d) The actual movement of a body is collected as digital data, and on the basis of such data, multiple images with realistic movement are created.

**Q26.** Which of the following is an appropriate explanation concerning the data structure in a relational database?

- a) Data and methods are unified (i.e., encapsulated) and stored.
- b) Data is represented with one or more two-dimensional tables.
- c) Parent records and child records are linked with a pointer.
- d) Tags are used to represent data structure and meaning.

**Q27.** In a relational database, there are two conditions that must be met as a primary key constraint. One condition is that there are no duplicate key values. Which of the following is another condition?

- a) The primary key must be composed of only one column.
- b) The primary key must be defined as the first column of a table.
- c) The primary key value must match the candidate key of another table.
- d) The primary key value must not be null.

**Q28.** In order to find all rows from the “Books” table that include “UNIX” in the title, the SQL statement is used as shown below. Which of the following is an appropriate character string that is specified in blank A? Here, the title is stored in the “Title” column of the “Books” table.

**SELECT \* FROM Books WHERE Title LIKE ' A '**

- a) %UNIX                      b) %UNIX%                      c) UNIX                      d) UNIX%

**Q29.** Which of the following is the relational operation that corresponds to the manipulation of the SQL statement for Table R shown below?

R

A1	A2	A3	A4	A5
----	----	----	----	----

[SQL statement]

**SELECT A1, A3, A5 FROM R**

- a) Difference    b) Join  
c) Projection    d) Selection

**Q30.** When the SQL statement below is executed under the given conditions, what is the maximum number of rows that are created?

```
SELECT P.ProductID, P.ProductName, S.SalesAmount
FROM Product P LEFT JOIN Sales S
ON S.ProductID = P.ProductID
```

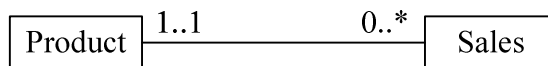
[Conditions]

1. There are two relational database tables “Product” and “Sales” as shown below.

Product: ProductID, ProductName, UnitPrice

Sales: ProductID, SalesQuantity, SalesAmount

The relationship between “Product” and “Sales” is illustrated by using a UML class diagram as shown below.



2. There are 2,000 rows in the “Product” table and 100,000 rows in the “Sales” table.

- a) 2,000                      b) 100,000                      c) 101,999                      d) 200,000,000

**Q31.** In computer networking, which of the following is the most appropriate technical term that means the variation in packet delay that causes the degradation of the QoS (Quality of Service) of real-time audio or video streaming service such as VoIP?

- a) Crosstalk                      b) Glitch                      c) Jitter                      d) Ripple

**Q32.** Which of the following is the network device that enables LANs to be interconnected at the physical layer of the OSI basic reference model?

- a) Bridge                                      b) Gateway  
c) Repeater                                      d) Router

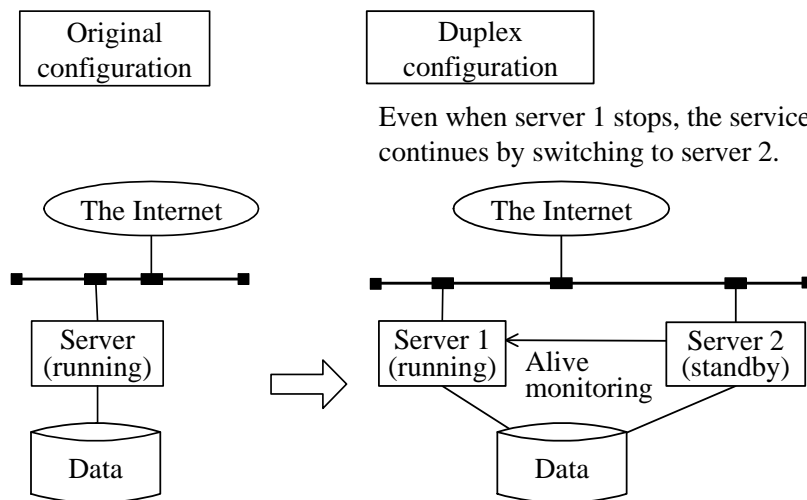
**Q33.** Which of the following is a mechanism that enables a variety of information, such as still images, movies, and audio, to be sent via e-mail?

- a) FTP                                      b) MIME                                      c) POP3                                      d) TELNET

**Q34.** In a TCP/IP network using IPv4 addresses, which of the following is a valid network address? Here, the number following a slash (/) is the number (in decimal) of bits allocated to represent the network number.

- a) 123.0.0.30/27
- b) 150.60.0.130/25
- c) 196.74.38.20/28
- d) 210.11.190.192/26

**Q35.** Which of the following is the effect that is expected by duplexing a server configuration, as shown in the figure below?



- a) Improvement in accountability
- b) Improvement in availability
- c) Improvement in confidentiality
- d) Improvement in integrity

**Q36.** When Mr. A sends Mr. B an e-mail with a digital signature created by using public key cryptography, which of the following is the appropriate combination of the keys that are used by Mr. A and Mr. B?

	Key that Mr. A uses to create digital signature	Key that Mr. B uses to verify digital signature
a)	Mr. A's private Key	Mr. A's public Key
b)	Mr. A's public Key	Mr. A's private Key
c)	Mr. B's private Key	Mr. B's public Key
d)	Mr. B's public Key	Mr. B's private Key



**Q37.** When security attacks to a computer system are classified into three categories (i.e., reconnaissance attack, access attack, and DoS attack), which of the following is classified as a reconnaissance attack?

- a) Attempting to discover and map out systems, services, or vulnerabilities
- b) Compromising the availability of a network, host, or application
- c) Exploiting known vulnerabilities in authentication services or other Web services
- d) Sending an extremely large number of requests over a network or the Internet

**Q38.** Which of the following is an appropriate explanation concerning the security attack that is classified as DNS cache poisoning?

- a) In order to block the service that is an attack target, an attacker sends a large number of recursive queries by using the DNS server as a stepping stone.
- b) In order to obtain internal information, the zone information stored in the DNS server is transferred all at once.
- c) Incorrect domain information is injected into the DNS server referenced by a PC, which leads the PC user to a fake Web server.
- d) The version information of the software used by a DNS server is obtained to identify a security hole in the DNS server.

**Q39.** Which of the following is a method for preventing an SQL injection attack?

- a) Ensuring that the input characters are not interpreted as characters that have a special meaning in an inquiry or operation to the database
- b) Rejecting an input text if the overall length of the input text exceeds the applicable maximum size limit
- c) Rejecting an input text that contains the character string (../) that specifies a higher level directory
- d) Replacing the HTML tags of an input text with other character strings that are not interpreted as HTML tags

**Q40.** When the procedure below is performed in terms of security, which of the following can be done by recipient *B*, in addition to the detection of message falsification?

[Procedure]

Process of sender *A*

- (1) A hash function is used to generate a digest from a message.
- (2) The sender's secret signature generation key is used to generate a signature for the message from the digest generated in (1).
- (3) The message and the data generated in (2) are sent to recipient *B*.

Process of recipient *B*

- (4) A hash function is used to generate a digest from the received message.
- (5) The received data, the digest generated in (4), and sender *A*'s signature verification key are used to verify the signature.

- a) Confirming that the message is from sender *A*
- b) Detecting wiretapping on the message
- c) Identifying the areas of falsification
- d) Preventing leakage of the message

**Q41.** Which of the following is the security attack that is shown in the procedure below?

[Procedure]

- (1) An attacker creates a bogus Web site under the guise of a financial institution.
- (2) The attacker pretends to be an employee of the financial institution and sends an e-mail that describes a URL leading to the bogus Web site.
- (3) The recipient of the e-mail trusts the e-mail and clicks on the URL. The recipient is then led to the bogus Web site.
- (4) The recipient does not notice that the Web site is bogus, and the entered authentication information is passed to the attacker.

- |                          |                |
|--------------------------|----------------|
| a) Bot                   | b) DDoS attack |
| c) Mail header injection | d) Phishing    |

**Q42.** Which of the following is regarded as risk sharing or risk transfer?

- a) Breaking down or aggregating risks into manageable units
- b) Distributing risk to other parties by purchasing insurance
- c) Eliminating the source of a risk
- d) Reducing the rate of occurrence of loss or damage

**Q43.** When a packet filtering firewall controls packets in accordance with a list of rules as shown below, which of the following is the appropriate control for packet A defined below? Here, the firewall checks the rules in listed order. If any one of the rules is applied, the remaining rules are not checked.

[List of rules]

Number	Source Address	Destination Address	Protocol	Source Port number	Destination Port number	Action
1	10.1.2.3	*	*	*	*	Blocked
2	*	10.2.3.*	TCP	*	25	Permitted
3	*	10.1.*	TCP	*	25	Permitted
4	*	*	*	*	*	Blocked

Note: “\*” represents an arbitrary value or pattern.

[Packet A]

Source Address	Destination Address	Protocol	Source Port number	Destination Port number
10.1.2.3	10.2.3.4	TCP	2100	25

- a) Blocked by number 1
- b) Blocked by number 4
- c) Permitted by number 2
- d) Permitted by number 3

**Q44.** Which of the following is a method that is used for encrypting e-mail?

- a) BASE64
- b) GZIP
- c) PNG
- d) S/MIME

**Q45.** Which of the following is the function that can be implemented with HTTPS?

- a) Detection of the falsification of a file on a Web server
- b) Intrusion detection for a client
- c) Server authentication with an electronic certificate
- d) Virus check on a client

**Q46.** The diagrams used in UML 2.x (including 2.0 and later versions) are categorized into two types of diagrams: structure diagrams and behavior diagrams. Structure diagrams show the static structure of the objects in a system. Behavior diagrams show the dynamic behavior of the objects in a system. Which of the following is an appropriate combination of diagrams that belong to each category?

	Structure diagram	Behavior diagram
a)	Class diagram Component diagram	Sequence diagram Use case diagram
b)	Component diagram Object diagram	Communication diagram Deployment diagram
c)	Deployment diagram Object diagram	Activity diagram Component diagram
d)	Object diagram Use case diagram	Sequence diagram State machine diagram

**Q47.** According to the ISO/IEC 25010 standard, the quality properties of a software product or system are categorized into eight characteristics: functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability. Which of the following is the appropriate explanation of “performance efficiency”?

- a) Degree to which a product or system can be used by specified users to achieve specified goals in a specified context of use
- b) Degree to which a product or system provides capabilities relative to the amount of resources used under stated conditions
- c) Degree to which a product or system provides functions that meet stated and implied needs when used under specified conditions
- d) Degree to which a system, product, or component performs specified functions under specified conditions for a specified period of time

**Q48.** Which of the following is an appropriate deliverable that must be approved when the external design of a system is completed?

- a) Physical database specification
- b) Program flowchart plan
- c) Screen layout
- d) System development

**Q49.** In terms of the test coverage of a program module, which of the following is an appropriate explanation of the relationship between path coverage, branch coverage, and statement coverage?

- a) 100% branch coverage implies 100% path coverage but not statement coverage.
- b) 100% path coverage implies 100% statement coverage but not branch coverage.
- c) 100% path coverage implies both 100% branch coverage and statement coverage.
- d) 100% statement coverage implies 100% branch coverage but not path coverage.

**Q50.** When an integration test is performed by using the top-down approach, which of the following is particularly necessary?

- a) Debugger
- b) Driver
- c) Emulator
- d) Stub

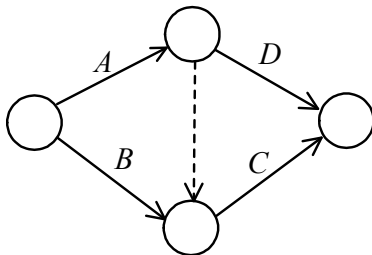
**Q51.** Which of the following is a characteristic of a project?

- a) A project is both unique and temporary.
- b) A project is neither unique nor temporary.
- c) A project is not unique but is temporary.
- d) A project is unique but not temporary.

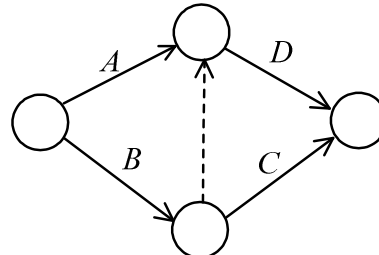
**Q52.** There are four activities *A* through *D* shown in the table below. Activities *A* and *B* can be performed in parallel. However, the other activities cannot be done until their preceding activities are completed. For example, *C* cannot begin until *B* is completed. Which of the following is the appropriate arrow diagram that corresponds to this table? Here, a dotted line shows a dummy activity.

Activity	Preceding activity
<i>A</i>	—
<i>B</i>	—
<i>C</i>	<i>B</i>
<i>D</i>	<i>A</i> , <i>B</i>

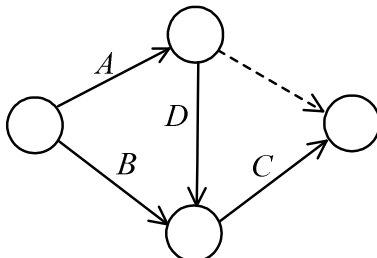
a)



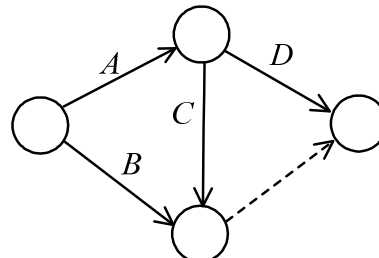
b)



c)



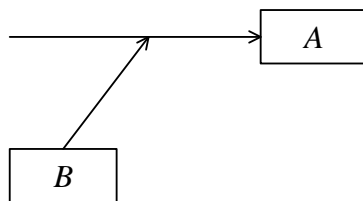
d)



**Q53.** Which of the following is an appropriate purpose of using a WBS (Work Breakdown Structure) in software development?

- a) To clarify the time sequence of activities, and understand the critical path that should be intensively managed
- b) To decompose all development activities into smaller steps with a manageable size, and organize them into a hierarchical structure
- c) To optimize the total cost when there is a trade-off relationship between the number of days and cost that are required for development
- d) To show the schedule of each activity by using a horizontal bar, and clarify not only the start and end points of each activity but also the progress at the current point

**Q54.** The figure below shows part of a so-called fishbone diagram. Which of the following is the relationship between *A* and *B*?



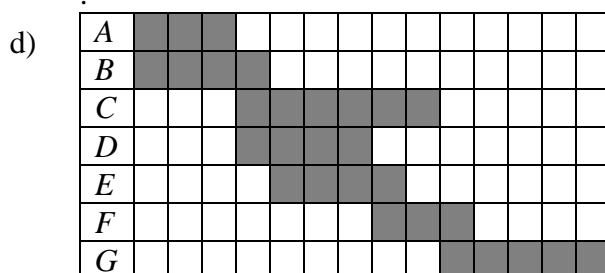
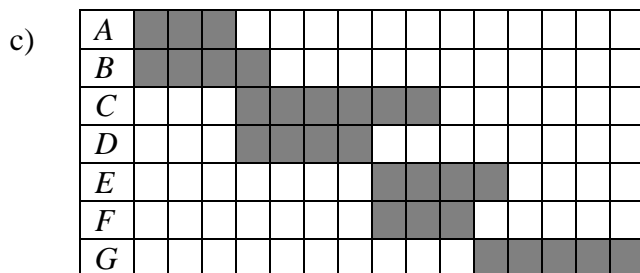
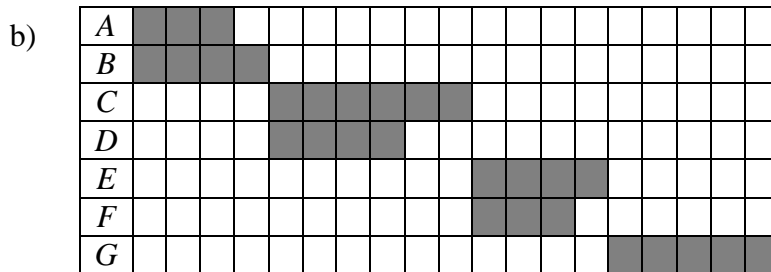
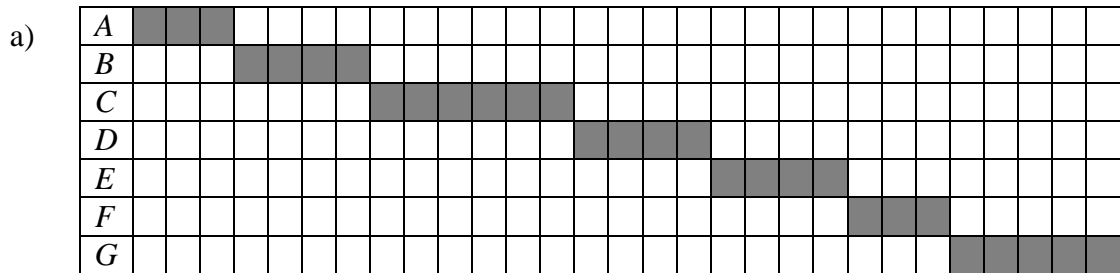
- a) *B* is a cause of *A*.
- b) *B* is a means of *A*.
- c) *B* is a purpose of *A*.
- d) *B* is an attribute of *A*.

**Q55.** Which of the following is an explanation concerning a Pareto chart?

- a) It is used to identify problems by sorting the classified items in descending order of frequency of occurrence and illustrating a bar chart with a cumulative line chart.
- b) It is used to objectively manage the variation in the data occurring in time series by expressing it as a line graph and using control limit lines.
- c) It is used to systematically arrange the relationships between cause and effect in a fishbone format, and clarify which causes are related to a particular result.
- d) It is used to understand the variation in quality by classifying the collected data into several sections and plotting the number of data belonging to each section as a bar graph.

**Q56.** The table below shows seven activities, their relationships, and the number of days required to complete each activity in a software development project. When the activities *A* and *B* begin simultaneously and are performed in parallel, which of the following is an appropriate Gantt chart that corresponds to this table?

Activity	Preceding activity	Number of days required
<i>A</i>	–	3
<i>B</i>	–	4
<i>C</i>	<i>A</i>	6
<i>D</i>	<i>A</i>	4
<i>E</i>	<i>B</i>	4
<i>F</i>	<i>D</i>	3
<i>G</i>	<i>C, E</i>	5





**Q57.** Which of the following is an appropriate policy for creating an SLA?

- a) Setting a compensation as a penalty for every item that has a service level
- b) Setting a service level for every item that can be taken into consideration
- c) Setting a service level that is maintained into the future without any changes
- d) Setting a service level under the cost and needs of a service provider and its customers

**Q58.** Among the management functions for service support, which of the following has the objective that aims to restore agreed service to the business as soon as possible or to respond to service requests?

- a) Business relation management
- b) Change management
- c) Incident management
- d) Problem management

**Q59.** Which of the following is the most appropriate description concerning a backup method for data?

- a) In consideration of a possible response delay in business processing, a backup schedule is adjusted so that it does not overlap with business processing.
- b) In order to shorten the time necessary for a backup operation, backup data with a different file name is placed on the same storage medium.
- c) In order to shorten the time necessary for recovery from the backup data, differential backup is used.
- d) In order to store the backup data for a long period of time, a random access medium is used.

**Q60.** When software asset management is audited, which of the following is an appropriate point to be checked?

- a) Checking to see if compatibility with existing systems is evaluated at the time of installation
- b) Checking to see if evidence, such as a software license certificate, is properly filed and retained
- c) Checking to see if failures are properly localized through database partitioning or other methods
- d) Checking to see if the organizational and functional structure of the software provider is taken into consideration

**Q61.** Among the situations that are checked during an audit of the methods of transmitting highly confidential information to a business partner by e-mail, which of the following is an appropriate situation from the viewpoint of preventing information leakage?

- a) A password is set for an attached file containing confidential information prior to being sent to the partner by e-mail, and the password is transferred in another way.
- b) A password is set for an attached file containing confidential information, and the password is described in the body text of the same e-mail that is sent to the partner.
- c) Confidential information is directly described in the body text of an e-mail that is sent to the partner.
- d) Confidential information is uploaded to the public Web site of the company, and the URL of the corresponding page is sent to the partner by e-mail.

**Q62.** Which of the following is an appropriate activity that is undertaken by a system auditor who makes an audit of access control?

- a) Creation and storage of management records for access control concerning software
- b) Establishment of a management policy for access control concerning network
- c) Implementation of operations management for access control concerning hardware
- d) Verification of the management status of access control concerning data

**Q63.** Among the architectures included in the “four domains” of the enterprise architecture, which of the following is the architecture other than business architecture, technology architecture, and application architecture?

- a) Bus architecture
- b) Data architecture
- c) Software architecture
- d) System architecture

**Q64.** IT investment evaluation is performed as prior evaluation, interim evaluation, or post evaluation according to each stage of the planning, execution, and completion for an individual project. Which of the following is an explanation concerning “prior evaluation”?

- a) Analyzing in detail not only the differences between the execution plan and the actual results but also their causes, and determining whether the investment amount and performance objectives need to be changed
- b) Evaluating the status of achievement of the performance objectives that are set beforehand, and on an as-required basis, considering the improvement plan for achieving the original objectives
- c) Planning beforehand the period of achieving the performance objectives and the method of collecting the data necessary for evaluation, and then performing evaluation according to that period
- d) Setting the performance objectives based on the purpose of investment, and providing the top management with information necessary for determining the feasibility of implementation

**Q65.** Which of the following is the purpose of defining a business model at the planning stage of total optimization in an information strategy?

- a) To confirm operational procedures in order to create user manuals and operations manuals required for the actual operations of the information system
- b) To identify the components, such as hardware, software, and networks, which are required to build the information system
- c) To organize the relationships between a company’s entire business operations and their utilized information, and establish a clear vision for the information system
- d) To understand the scope and development scale of computerization, and estimate the required time, person-hours, and costs for system development

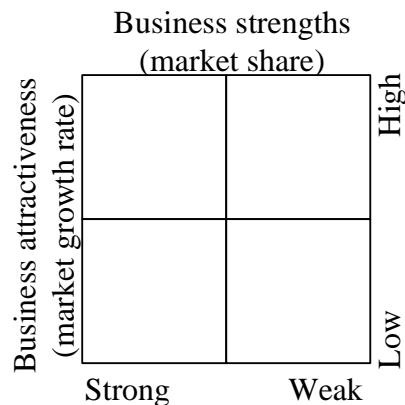
**Q66.** When a computerization plan is made, which of the following is an item to be considered?

- a) Clarifying the cost and investment effect of the development, maintenance, and operations of the system
- b) Describing the test plan, operation manuals, and measures against failures in a specific and clear way
- c) Installing an equivalent system used by other companies in the same industry in order to avoid failures
- d) Proceeding with the plan on the premise that the system is developed by a company's own staff in view of system operations

**Q67.** Which of the following is an explanation concerning non-functional requirements definition?

- a) It clearly defines the business functions that are performed by manual operations rather than automated systems, from among the business requirements.
- b) It clearly defines the conformity of the new package to be installed, in order to implement business requirements.
- c) It clearly defines the functions that are not supported in the current system, in order to determine the business requirements.
- d) It clearly defines the quality requirements, technical requirements, and operational requirements necessary to implement business requirements.

**Q68.** The matrix shown below is used for PPM (Product Portfolio Management). Which of the following is the purpose of analyzing business plans and competitive superiority by using this matrix?



- a) To evaluate the current position of a company so that the promotion effect set as an objective can be measured
- b) To evaluate the current position of a company as the basis for setting an objective and prioritizing resource allocation
- c) To evaluate the marketing tactics for maintaining a competitive edge in the market by setting an objective and improving product quality
- d) To evaluate the change in the market by considering seasonal fluctuation factors and geographical distribution, in order to set an objective

**Q69.** Which of the following is an explanation concerning a franchise chain in the retail industry?

- a) A form of organization where a group of outlet stores are opened in a commercial shopping area that is developed under a local or regional development plan
- b) A form of organization where a head office allows its members to use the trademarks and signs, and also provides managerial training and assistance, at a fixed rate of compensation
- c) A form of organization where a wholesale distributor plays a leading role and multiple retailers voluntarily participate to gain the benefit of cooperation while their independence is maintained
- d) A form of organization where multiple retailers perform their business activities, such as procurement, inventory management, and product development, in cooperation with each other

**Q70.** Which of the following is the primary purpose of implementing an ERP system that is used for business management?

- a) To build a long term relationship with the customer as a result of deepened understanding of customer's needs and desire
- b) To integrate all departments and functions across a company into a single computer system that can serve the entire company's needs
- c) To maximize the value added along the series of business operations including purchase, production, sale, and distribution
- d) To transform raw data into meaningful and useful information for business purposes and implement an effective strategy that can provide a competitive market advantage

**Q71.** Which of the following is an appropriate explanation concerning product innovation in the management of technology?

- a) Developing a new or differentiated product that is a key to success
- b) Making an operating profit through the results of technology development
- c) Making progressive reforms in the business process
- d) Managing strategic business that revolves around technology

**Q72.** Among the various types of e-commerce transactions, which of the following is an appropriate example of B2C (i.e., "B to C")?

- a) Company A places an online order of materials from its supplier twice a month.
- b) Mr. B buys a book from an online shop owned by Company A.
- c) Mr. B pays an annual tax via a Web site hosted by the central tax office.
- d) Mr. B posts an online advertisement to sell his car and finally Mr. C buys it.

**Q73.** Which of the following is an explanation concerning EDI?

- a) A communication service that provides added values, such as storage of data transmitted over networks and conversion of data formats
- b) An international standard for e-mail services based on the OSI model, which provides comprehensive services for the generation, transmission, and processing of messages
- c) An ordering system that enables orders to be placed by transmitting order information from a data entry terminal to the head office or a supplier
- d) The exchange of business transaction data between computers over the Internet or other dedicated communication lines, in accordance with standard protocols

**Q74.** Which of the following is an organization structure where employees report to both their individual immediate managers and a cross function leader and try to achieve coordination between program groups and centrally controlled groups of functional specialists?

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

**Q75.** Which of the following is an explanation concerning the accountability at an executive managerial level?

- a) A company quantifies the cost involved in environmental maintenance and its effect, and announces them periodically as financial information.
- b) A management executive has responsibility for explaining the content and performance of business activities to shareholders and other interested parties.
- c) Appropriate information that is necessary for investment decisions is provided to investors and analysts on a timely and ongoing basis.
- d) Rules, manuals, and checking systems are established on the basis of corporate ethics, and corporate management is performed in accordance with laws.

**Q76.** Which of the following is a case example that is suitable for ABC analysis?

- a) A detailed forecast of sales and stock requirements needs to be analyzed to prevent a shortage of stock.
- b) Information about the combination of products that are purchased by customers needs to be analyzed.
- c) Market demand needs to be analyzed by conducting a questionnaire survey of opinion leaders in each region.
- d) The hot-selling products need to be analyzed on the basis of the sales value and gross profit of each product.

**Q77.** Company *T* sells three types of products *A*, *B*, and *C*. At present, products *A*, *B*, and *C* are sold to 10,000, 20,000, and 30,000 customers respectively every month. The product lineup is to be updated from the next year, and four new types of products *P*, *Q*, *R*, and *S* are to be sold.

As such, the ratio (in percentage) of current customers who are expected to buy new products and the number of new customers are estimated as shown in the table below.

Which of the following is an appropriate description concerning this estimate?

	Number of customers	<i>P</i>	<i>Q</i>	<i>R</i>	<i>S</i>
<i>A</i>	10,000	50%	30%	10%	10%
<i>B</i>	20,000	10%	60%	10%	10%
<i>C</i>	80,000	10%	10%	30%	30%
Number of current customers		15,000	23,000	27,000	27,000
Number of new customers		5,000	7,000	13,000	23,000

- a) Among the customers of product *A*, 1,000 customers are expected to buy product *Q*.
- b) Half of the prospective customers of product *P* are expected to be the customers of product *A*.
- c) The customers of product *B* are expected to buy any one of products *P*, *Q*, *R*, and *S*.
- d) The number of new customers of product *S* is expected to be less than the number of customers of product *S* among the customers of product *C*.



**Q78.** When a single-license software package is purchased in a company, which of the following is an activity that is usually permitted in conformity with the concept of the WTO's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)?

- a) Installing the software package on a large number of computers that are used for the company's business
- b) Making a backup copy of software for the limited purposes, such as the licensee's personal use or a temporary copy for maintenance
- c) Modifying the software package for the company's internal use and using it on a large number of computers in the company
- d) Placing the software package on the company's internal Web site so that staff members can download and install it

**Q79.** When the carry-over from the previous month and the quantity of inventory transactions for a product are as shown in the table below, what is the cost of sales (in dollars) calculated for the current month by using the first-in first-out method?

Date	Type of transaction	Transaction quantity		Unit price (dollars)
		Receiving quantity	Shipping quantity	
1st	Carry-over from the previous month	100		200
5th	Purchase	50		215
15th	Sales		70	
20th	Purchase	100		223
25th	Sales		60	
30th	Carry-over to the next month		120	

- a) 26,290
- b) 26,450
- c) 27,250
- d) 27,586

**Q80.** Among the descriptions concerning personal data, which of the following is **not** an appropriate description from the viewpoint of “OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data”?

- a) Personal data should be allowed to be acquired without announcing the acquisition of such data.
- b) Personal data should be handled within the scope of the purpose of use agreed by a data subject.
- c) Personal data should be kept accurate, complete, and up-to-date within the scope of the purpose of use.
- d) Personal data should be outsourced to a third party after the prior consent of the data subject.