



May 2015

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 spring Fundamental IT Engineer Examination conducted in 2015?

a) March

b) April

c) May

d) June

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

[Sample Answer]

Q1	<input type="radio"/> a	<input type="radio"/> b	<input checked="" 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

Notation in the exam questions	Name of the standard
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/IEC 25010:2013
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.

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- Q5.** When the condition and inferences are given as shown below, which of the following is the appropriate combination that supports the validity of the two inferences?

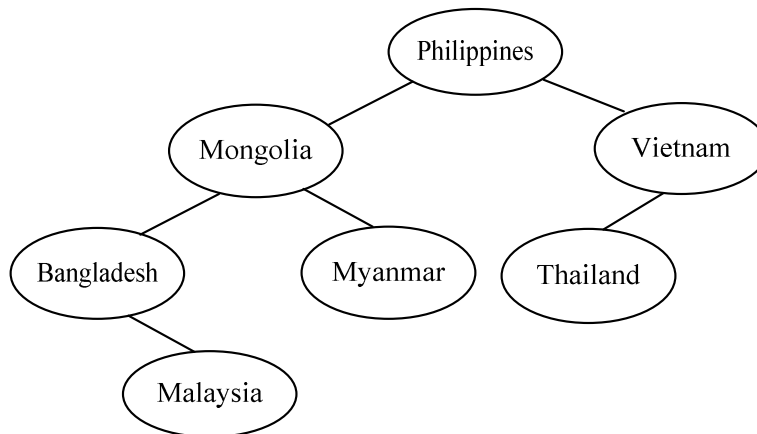
Condition: If it rains, then the street will be wet.

Inference 1: The street is not wet, and therefore, it did not rain.

Inference 2: It did not rain, and therefore, the street is not wet.

	Inference 1	Inference 2
a)	Not valid	Not valid
b)	Not valid	Valid
c)	Valid	Not valid
d)	Valid	Valid

- Q6.** As shown below, there is a binary search tree where each node contains a country name and is ordered alphabetically so that Mongolia comes before Philippines, Myanmar comes before Philippines but after Mongolia, and so on. Which of the following is the appropriate order of the country names that can create this binary search tree by inserting each country name in an empty tree?



- a) Malaysia, Bangladesh, Mongolia, Myanmar, Philippines, Vietnam, Thailand
- b) Malaysia, Bangladesh, Myanmar, Mongolia, Thailand, Vietnam, Philippines
- c) Philippines, Malaysia, Bangladesh, Mongolia, Myanmar, Thailand, Vietnam
- d) Philippines, Vietnam, Mongolia, Thailand, Bangladesh, Myanmar, Malaysia

Q7. In a real time system, which of the following is the data structure that is most suitable for the scheduling of multiple tasks with different priority levels?

- a) Binary tree b) FIFO queue c) Linked list d) Stack

Q8. When the function $M(n)$ is defined as shown below, what is the value of $M(97)$?

$$M(n) = \begin{cases} n - 10 & (n > 100) \\ M(M(n + 11)) & (n \leq 100) \end{cases}$$

- a) 81 b) 86 c) 91 d) 96

Q9. As shown in the table below, there are five items A through E . Each item cannot be divided into smaller pieces. When a knapsack with a maximum volume of 7 units is available for carrying the items, which of the following is a set of items to be packed in the knapsack so that the total price can be maximized?

Item	Volume	Price
A	3	4
B	2	3
C	3	5
D	1	2
E	5	9

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

- Q10.** As shown in the table below, there are a total of 86 coins that are composed of five types of coins. Of those 86 coins, 60 coins are picked up so that the total value can be maximized. What is the total value in dollars? Here, 100 cents are equivalent to 1 dollar.

Type of coin	Number of coins
5-cent	20
10-cent	30
20-cent	25
50-cent	10
1-dollar	1

- a) 6 b) 9 c) 10.5 d) 13.4

- Q11.** As shown the figure and table below, there are two types of CPUs *X* and *Y* that have the same configuration except that the access times of cache memory and main memory are different from each other. All other conditions of the two CPUs are the same. When a certain program is executed on both CPU *X* and CPU *Y*, the processing time of each CPU is the same. Under these conditions, what is the hit ratio of the cache memory? Here, there are no effects from other than CPU processing.

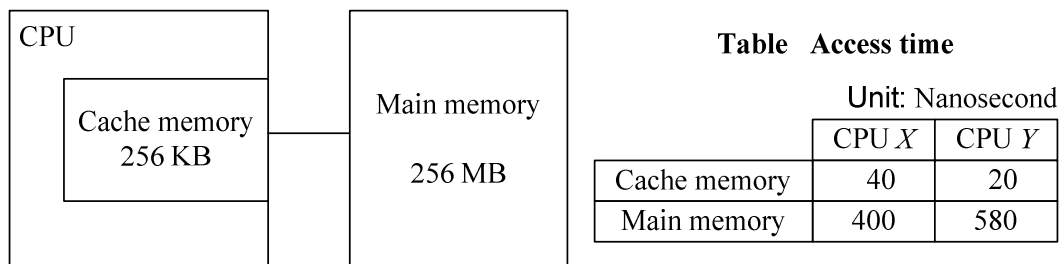


Figure Configuration

- a) 0.75 b) 0.90 c) 0.95 d) 0.96

- Q12.** There exists a system that requires the execution of 800,000 instructions per transaction. When the processor performance is 200 MIPS and the utilization rate of the processor is 80%, what is the processing power in transactions per second?

- a) 20 b) 200 c) 250 d) 313

Q13. Which of the following is an appropriate purpose of the parity check of a memory module?

- a) To detect and correct an error automatically during reading
- b) To detect the occurrence of an error during reading
- c) To determine whether power is supplied to the memory module
- d) To encrypt the data read out from the memory module

Q14. Which of the following is an appropriate explanation of a capacitive touch panel?

- a) An electric field is formed on the surface, and the touched position is detected on the basis of the change in the surface electric charge.
- b) Electrode switches are aligned in a matrix shape, and the touched position is detected by the electronically conducted electrode.
- c) The touched position is detected on the basis of the change in the reflection of the infrared ray that is blocked by touching the panel.
- d) Voltage is applied to an electrically resistant film, and the touched position is detected on the basis of the change in resistance.

Q15. Which of the following is the most appropriate method for the implementation of a fault tolerant system?

- a) A fault tolerant system is not implemented by using hardware, but rather by using software.
- b) Devices and equipment are not dual-redundant, but important processes are performed on devices with high availability.
- c) The system is multiplexed with two or more computers instead of using a single computer.
- d) The system is not implemented in a fail-soft configuration, but rather in a fail-safe configuration.

Q16. Which of the following is the most appropriate explanation of a benchmark test for a computer system?

- a) It is determined whether or not the system has a tolerance to handle the expected number of transactions.
- b) The performance of a system is measured from the average time required to execute a single instruction.
- c) The processing performance of a system is compared with other systems in terms of scores obtained by executing software for measurement.
- d) The proportion of continuous operation time of a system is measured and compared with other systems.

Q17. There exist the same two devices, each with an MTBF of 45 hours and an MTTR of 5 hours. What is the availability of a system that connects these two devices in series?

- a) 0.81 b) 0.90 c) 0.95 d) 0.99

Q18. Among the descriptions concerning process scheduling, which of the following is an appropriate explanation of the round robin method?

- a) CPU resources are allocated to each process in order of priority specified in advance when a particular event occurs.
- b) CPU resources are allocated to each process in order of processing time from shortest to longest.
- c) CPU resources are allocated to the first executable process in the queue when an interval-timer interrupt is generated.
- d) CPU resources are allocated to the process that needs to start immediately when some kind of interrupt is generated.

Q19. When SRT (Shortest Remaining Time), also known as SRTF (Shortest Remaining Time First), is used as a scheduling method for three processes P_1 through P_3 shown in the table below, what is the total waiting time (in seconds) of P_2 that elapses before its execution completion?

Unit: second

Process	Length of execution time	Time of arrival
P_1	20	0
P_2	25	15
P_3	10	30

- a) 5 b) 10 c) 15 d) 20

Q20. Which of the following is an explanation of the function of an archiver that is one of the data management utilities?

- a) Compiling several files into one file, or returning a file to its original condition in order to perform data backup and distribution
- b) Creating both an area for recording data and an area for managing data on a single hard disk
- c) Keeping data secure through file protection for safeguarding data from unauthorized use and destruction, and also through copy protection for preventing unauthorized copying
- d) Rearranging a file into contiguous areas, to the extent possible, on a hard disk in which fragmentation has occurred

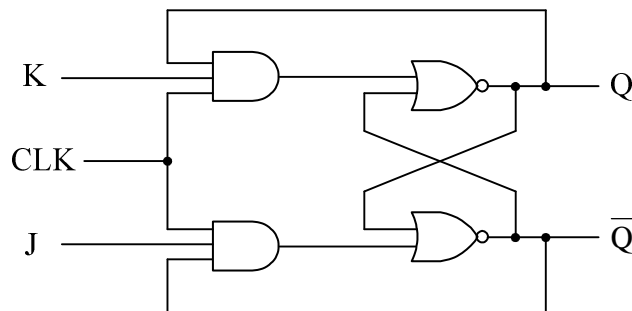
Q21. Which of the following is an appropriate explanation of optimization in a compiler?

- a) Generating an intermediate code used for an interpreter rather than generating an object code
- b) Generating an object code that displays the called subprogram name or the contents of a variable at a particular point of time during the execution of the program
- c) Generating an object code that operates in a computer with a different architecture from the computer in which the source code is complied
- d) Generating an object code with improved run-time processing efficiency by analyzing the source code

Q22. Which of the following is classified as a function of a static test tool?

- a) Calculating the coverage from the paths executed by the test
- b) Detecting an error in a program by analyzing the source code
- c) Generating a driver or a stub necessary for the module to be tested
- d) Generating the data for testing a specific path of the program

Q23. The logic circuit below shows a JK flip-flop. Which of the following is the appropriate truth table for the JK flip-flop. Here, the state of each output signal is affected only when the clock signal CLK changes from 0 to 1. “No Change” means that each output signal maintains its previous state, and “Toggle” means that each output signal switches (or toggles) its state “from 0 to 1” or “from 1 to 0.”



- a)

Input signals		Output signals	
J	K	Q	\bar{Q}
0	0	No change	
0	1	0	1
1	0	1	0
1	1	Toggle	

b)

Input signals		Output signals	
J	K	Q	\bar{Q}
0	0	Toggle	
0	1	0	1
1	0	1	0
1	1	No change	

c)

Input signals		Output signals	
J	K	Q	\bar{Q}
0	0	No change	
0	1	1	0
1	0	0	1
1	1	Toggle	

d)

Input signals		Output signals	
J	K	Q	\bar{Q}
0	0	Toggle	
0	1	1	0
1	0	0	1
1	1	No change	

Q24. A D/A (digital-to-analog) converter with a resolution of 8 bits generates the output voltage 0 volts for the digital input value 0, and the output voltage 2.5 volts for the digital input value 128. When the lowest one bit of the digital input value is changed, which of the following is the change (in volts) of the output voltage that is generated by the D/A converter?

- a) $\frac{2.5}{128}$ b) $\frac{2.5}{255}$ c) $\frac{2.5}{256}$ d) $\frac{2.5}{512}$

Q25. Which of the following is a memory module that uses a flip-flop circuit in a memory cell?

- a) DRAM b) EEPROM c) SDRAM d) SRAM

Q26. Which of the following is the function of a human interface that is used for reducing the number of operations of a user who frequently performs routine work?

- a) A function for displaying the input errors altogether on the last screen
b) A function for displaying which process is reached from among all processes
c) A function for enabling return to the previous state if an operation is wrong
d) A macro function by which a series of commands is grouped together

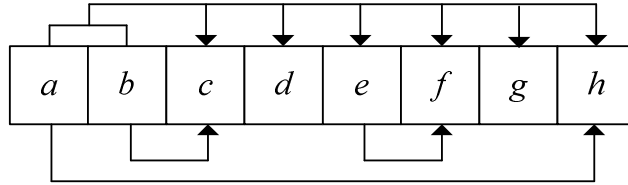
Q27. Which of the following is a tag-based very flexible image file format that can be lossless or lossy, and is widely used for the interchange of digital image data among graphic artists, photographers, and the publishing industry?

- a) JPEG b) GIF c) PNG d) TIFF

Q28. In a relational database table, which of the following is a column or a combination of columns whose values are defined by the primary key of another table in order to maintain referential integrity in the database?

- a) Candidate key b) Foreign key
c) Super key d) Surrogate key

Q29. There is a record that consists of eight attributes a through h as shown below. The primary key of the record is the combination of attributes a and b . Attributes h , c , and f can be determined by attributes a , b , and e respectively. Which of the following is the third normal form of this record?



- a)

a	h
-----	-----

b	c
-----	-----

a	b	c	d	e	f	g
-----	-----	-----	-----	-----	-----	-----
- b)

a	h
-----	-----

b	c
-----	-----

a	b	d	e	f	g
-----	-----	-----	-----	-----	-----
- c)

a	h
-----	-----

b	c
-----	-----

e	f
-----	-----

a	b	d	e	g
-----	-----	-----	-----	-----
- d)

a	b	c	d	e	f	g	h
-----	-----	-----	-----	-----	-----	-----	-----

Q30. Which of the following is an appropriate description of the ACID (Atomicity, Consistency, Isolation, and Durability) properties that are considered to be the key transaction processing features of a database management system (DBMS)?

- a) Atomicity refers to the ability of the application to make operations in a transaction appear isolated from all other operations.
- b) Consistency refers to the ability of the DBMS to guarantee that either all of the tasks of a transaction are performed or none of them are.
- c) Durability refers to the guarantee that once the user has been notified of success, the transaction persists, and is not undone.
- d) Isolation refers to the database being in a legal state when the transaction begins and when it ends.

Q31. When there are two relational database tables A and B as shown below, which of the following is the appropriate table that shows the result of the relational operation $A \div B$?

A

Employee_ID	Project_ID
S1	P1
S1	P2
S1	P3
S1	P4
S2	P1
S2	P2
S3	P2
S4	P2
S4	P4

B

Project_ID
P2
P4

a)

Employee_ID
S1
S2

b)

Employee_ID
S1
S4

c)

Employee_ID
S1
S2
S3
S4

d)

Employee_ID
S3
S4

Q32. For the “Product” table shown below, a transaction that executes the SQL statement below terminates abnormally because of the occurrence of a deadlock. Which of the following is the “Product” table after the abnormal termination? Here, other transactions use the “Product” table as reference but do not update it.

Product

Product_code	Product_name	Unit_price
A010	AAA	2,500
B020	BBB	1,000
C030	CCC	4,500

[SQL statement]

DELETE FROM Product WHERE Product_code = 'B020'

a)

Product_code	Product_name	Unit_price
A010	AAA	2,500
B020	NULL	1,000
C030	CCC	4,500

b)

Product_code	Product_name	Unit_price
A010	AAA	2,500
B020	BBB	1,000
C030	CCC	4,500

c)

Product_code	Product_name	Unit_price
A010	AAA	2,500
C030	CCC	4,500

d)

Product_code	Product_name	Unit_price
B020	BBB	1,000

Q33. In the Internet environment, a computer is able to send the ping command “ping 11.22.33.44” to the web server (e.g., www.xyz.com) of Company XYZ and then receive an echo reply message successfully. Also, the computer is able to browse the website by using URL “http://11.22.33.44”, but cannot browse the same website by using “http://www.xyz.com”. In the OSI basic reference model, which of the following is the layer that is most likely to be responsible for such a problem?

- a) Application layer
- b) Data Link layer
- c) Network layer
- d) Session layer

Q34. In the IPv4 addressing scheme, when the subnet mask "255.255.255.224" is used for Class C, which of the following is the maximum number of effective hosts per subnet, excluding the network and broadcast addresses?

- a) 6
- b) 30
- c) 62
- d) 254

Q35. Which of the following is the role of an ICMP protocol that is used as a network layer protocol of the OSI basic reference model?

- a) It allows multiple clients simultaneously connected to the same mailbox, and through flags stored on the server, different clients accessing the same mailbox at the same or different times can detect state changes made by other clients.
- b) It is used for messages to be generated and sent back to the source machine in order to indicate such faults as unreachable destinations, time limit exceeded, and parameter problems, and is also used by applications such as a ping command for diagnostic purposes.
- c) It is used by network management systems to communicate with network elements to monitor and control different aspects of the equipment.
- d) It sends routing-update messages at regular intervals and at the time of changes in the network topology. When a router receives a routing update that includes changes in the network topology, it updates its routing table to reflect the new route.

Q36. A system administrator has a plan to monitor a network in order to evaluate which employees are using an excessive amount of bandwidth on peer-to-peer sharing services. Which of the following is the most appropriate technique for achieving such a purpose?

- a) Dynamic packet filtering
- b) Packet sniffing
- c) Stateful packet inspection
- d) Static packet filtering

Q37. Which of the following is an appropriate description concerning “HTTP cookie”?

- a) HTTP cookies are created by a web browser and stored in the web server.
- b) HTTP cookies are used to contain data sent from a web server as plain text only.
- c) HTTP cookies can contain executable codes to perform some specific tasks.
- d) HTTP cookies cannot notify the visiting website about user’s previous activities.

Q38. In the context of information security defined by ISO/IEC 27001, which of the following is the property of safeguarding the accuracy and completeness of information assets?

- a) Authentication
- b) Availability
- c) Confidentiality
- d) Integrity

Q39. Which of the following is an appropriate characteristic of MAC (Message Authentication Code) that is used to authenticate a message and provide its integrity in cryptography?

- a) It is calculated by performing polynomial manipulations.
- b) It is constructed from cryptographic hash functions.
- c) It is generated and verified using both private and public keys.
- d) It is used with the receiver’s public key to encrypt a message.

Q40. Which of the following is a characteristic of the hash function that is used for a digital signature?

- a) Even if messages are different, the message digests are all the same.
- b) It is difficult to restore an original message from the message digest.
- c) The length of a message digest differs depending on the length of the message.
- d) Two different messages that generate the same message digest are easily obtained.

Q41. Which of the following is the salami technique that is used in computer crime?

- a) It is a technique where data that is being sent or received over a network is illegitimately intercepted.
- b) It is a technique where information that remains in a computer or its surrounding area after the execution of a program is searched to obtain necessary information.
- c) It is a technique where part of a communication line is accessed secretly, and another person's ID and password are stolen and used to steal data.
- d) It is a technique where theft is performed in small increments from many assets so that this fraudulent behavior is not noticed.

Q42. Mr. X sends an e-mail to Mr. Y by using the Internet. The contents of the e-mail must be kept confidential, so Mr. X uses public key cryptography to encrypt the e-mail. Which of the following is the key that is used to encrypt the contents of the e-mail?

- a) Mr. X's private key
- b) Mr. X's public key
- c) Mr. Y's private key
- d) Mr. Y's public key

Q43. Which of the following is the security attack that is used for an illegal attempt to manipulate the people of an organization into divulging the password and confidential information under the pretext of an emergency?

- a) Password cracking
- b) Social engineering
- c) Springboard attack
- d) Trojan horse

Q44. Which of the following is a feature that is incorporated by an attacker to enter the network or server of a company?

- a) Back door
- b) Digital forensics
- c) Strict routing
- d) Thin client agent

Q45. Which of the following is an explanation of BYOD (Bring Your Own Device)?

- a) An employee brings his or her own personal terminal to the office for personal use during non-working time such as breaks, which causes an increase in security risks such as a reduction in awareness of security.
- b) An employee brings his or her own personal terminal to the office to use for work, which causes an increase in security risks such as virus infections caused by inadequate security settings.
- c) An employee takes home an information terminal provided by his or her company and uses it for personal reasons, which causes an increase in security risks such as information leakage.
- d) An employee uses an information terminal provided by his or her company to work while in transit to another location such as a customer office, which causes an increase in security risks such as shoulder hacking.

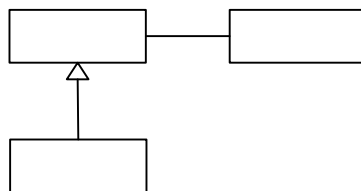
Q46. Which of the following is a mechanism by which a company or organization centrally manages the usage status of smartphones or such other devices that are lent to its staff members by making integrated settings according to the security policy, or by delivering business applications?

- a) BYOT (Bring Your Own Technology)
- b) ECM (Enterprise Content Management)
- c) LTE (Long Term Evolution)
- d) MDM (Mobile Device Management)

Q47. Which of the following is an appropriate preventive measure against malware that is taken on a client PC?

- a) In a periodic manual inspection for viruses on a PC, a virus scan is performed only on the files created after the signature file of the anti-virus software is updated.
- b) In order that no PC is infected with a virus attached to an e-mail, communication with unused TCP ports is prevented.
- c) In order that no PC is invaded by a worm, a global IP address is dynamically assigned to a client PC.
- d) In order that no virus exploits a vulnerability and infects a PC, revised software modules or patches are appropriately applied to the OS and applications.

Q48. In the UML diagram shown below, which of the following is described in the blank ?



- a) Aggregation name
- b) Association name
- c) Class name
- d) Use case name

Q49. In object-oriented development, it is possible to make settings such that the user is not affected even if the internal structure of an object is changed. Thus, it is possible to create a situation where the user of an object is not necessarily aware of the internal structure of the object. Which of the following is the term that represents the concept of implementing such development?

- a) Classification
- b) Encapsulation
- c) Modularization
- d) Structuration

Q50. In software development, which of the following is an appropriate explanation of a test that uses stubs?

- a) During the execution of a program, the contents of a variable or register are displayed as required, and the test is continued after the contents are modified if necessary.
- b) Each time a specific instruction is executed, the contents of registers and main memory are dumped to check whether the process is executed correctly.
- c) When a top-down test is performed, a dummy lower-level module that is called by the upper-level module is prepared to stand in for an unfinished portion of the program.
- d) When a unit test for a module is performed, a dummy higher-level module that calls the module is prepared to check whether the operation is executed correctly.

Q51. Which of the following is an appropriate explanation of the state transition diagram that is used for requirements analysis and design in system development?

- a) The flow of data between processes is described by using four symbols: data flow, process, data store, and external entity.
- b) The functions of a system are described from a top-level overview down to details in a stepwise manner.
- c) The overall structure of a program is represented in the form of a hierarchical structure.
- d) The triggers that change the state, such as the passage of time and the change in control signal, and the operations performed as a result are described.

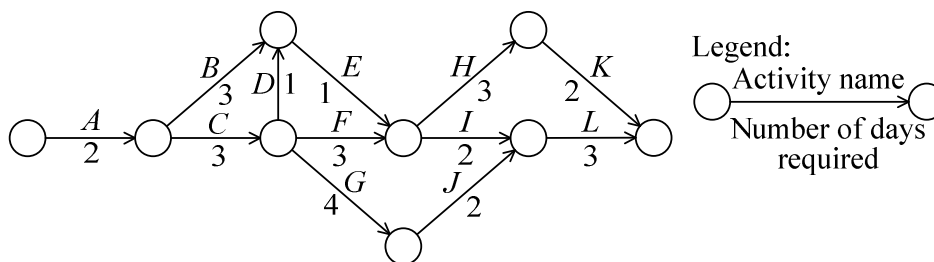
Q52. Among the software development activities, which of the following is an explanation of refactoring?

- a) In order to improve the maintainability of a program, its internal structure is modified without any change of the external specifications.
- b) In order to improve the quality of a program, two programmers cooperate with each other and perform the coding of a single program.
- c) In order to obtain feedback from users, the prototype of a program to be provided is created at an early stage.
- d) In order to promptly develop a program to be operated, test cases are set in advance, and then the program is coded.

Q53. Each letter (i.e., P, D, C, and A) of the “PDCA” cycle used for progress management of system development and quality management of software is the first letter of the corresponding word. Which of the following is the word that is represented by the third letter “C”?

- a) Challenge b) Change c) Check d) Control

Q54. Which of the following is the critical path of the project activities shown in the arrow diagram below?



- a) $A \rightarrow B \rightarrow E \rightarrow I \rightarrow L$ b) $A \rightarrow C \rightarrow D \rightarrow E \rightarrow H \rightarrow K$
 c) $A \rightarrow C \rightarrow F \rightarrow I \rightarrow L$ d) $A \rightarrow C \rightarrow G \rightarrow J \rightarrow L$

Q55. According to ITIL (IT Infrastructure Library), CSA (Configuration Status Accounting) is the recording and reporting of all current and historical data concerned with each CI (Configuration Item) throughout its life-cycle. Which of the following is an appropriate activity that is performed as part of CSA?

- a) Closing project or phase
 b) Collecting requirements
 c) Monitoring and controlling project work
 d) Performing integrated change control

Q56. According to “A Guide to the Project Management Body of Knowledge” (PMBOK Guide), which of the following is the knowledge area that includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups?

- a) Project communications management
- b) Project integration management
- c) Project quality management
- d) Project scope management

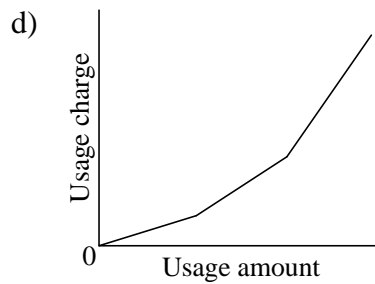
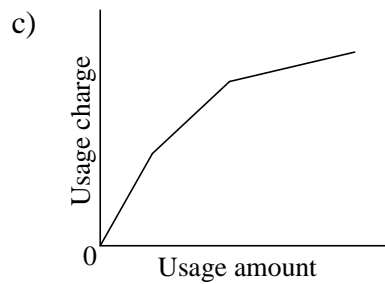
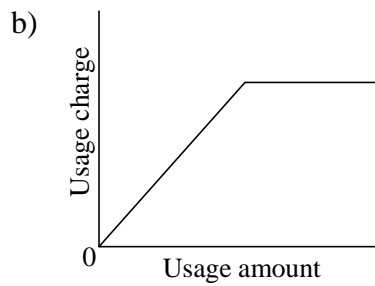
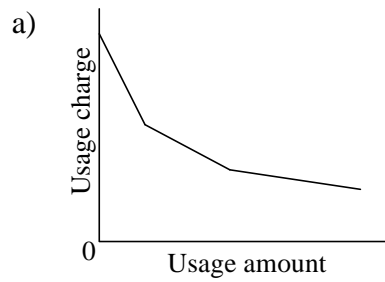
Q57. Which of the following is the most appropriate characteristic of the “big bang” migration method that is one of the system migration methods?

- a) Additional operational costs are incurred because of parallel operations.
- b) An additional application is required for connecting the old and new systems.
- c) The old and new systems operate in parallel, and migration to the new system is performed at a particular point of time.
- d) The problems that occur during migration to the new system have a big impact.

Q58. Which of the following is an explanation of a “known error” in IT service management?

- a) A new incident concerning which the service desk receives an inquiry
- b) A problem whose root cause is already identified or for which a workaround exists
- c) A program error detected during static inspection
- d) An inconsistency or insufficiency in service management planning

Q59. Which of the following is an appropriate graph that shows the usage charge of a computer system in an IT service based on the declining metered rate method?



Q60. Which of the following is an appropriate explanation of an audit working paper?

- a) It is a compilation of the auditor's own security promissory letter that is presented to the audited department or other related party prior to conducting an audit.
- b) It is a compilation of the standards and guidelines that are used for examination by the auditor.
- c) It is a document that the auditor uses as the basis of his/her judgment, which must be disclosed along with the audit report.
- d) It is an implementation record of the auditing procedure performed by an auditor, which forms the basis of the audit opinion.

Q61. Which of the following is an appropriate description concerning the implementation structure of a system audit?

- a) In order to enable the person requesting the audit to issue improvement instructions based on the audit report, the system auditor reports the audit results to the person requesting the audit.
- b) When an audit of the information system is performed as part of the operations audit, the audit team is formed by the members of the user department.
- c) When the status of development in the information systems department is to be audited, the audit team is formed by the members of that department who have full knowledge of the development details.
- d) When the system auditor takes the help of another expert, the decision concerning the range of support, methods, and audit results is made under the responsibility of that expert.

Q62. In the system design stage, which of the following is the point to be checked during the audit of control for reducing the risk of non-fulfillment of user requirements?

- a) All programming should be performed in accordance with the specified standards and conventions.
- b) The program specifications should be created on the basis of the system design documents.
- c) The test plan should be created on the basis of the system test requirements, and must also be approved by the responsible person of the system operations department.
- d) The user department should participate in the review of system design.

Q63. Which of the following is an explanation of SOA?

- a) SOA combines the three logical structures of sequence, selection, and iteration to perform component-level design.
- b) SOA facilitates response to business changes by constructing software from components called services.
- c) SOA is composed of the four main concepts of business architecture, data architecture, applications architecture, and technology architecture, and seeks to optimize business operations and systems.
- d) SOA uses data flow diagrams to simultaneously construct both models of information and models of functions.

Q64. Which of the following is an appropriate description of BPR (Business Process Reengineering)?

- a) BPR is a management practice that is used to provide the overall governance of an organization in a business process environment, with the goal of improving agility and operational performance.
- b) BPR is a management strategy that is used to automate key business processes that help in saving time, promoting efficiency, and ultimately reducing costs, in order to enhance the value of an organization.
- c) BPR is a management system that is used in marketing and business in order to automate the sales activities, such as contact management, order taking and fulfillment, information sharing, inventory monitoring, and sales forecast analysis.
- d) BPR is a management technique that is used to redesign and restructure the value-creating processes in an organization in order to gain significant benefits in productivity, profitability, service, and quality through maximizing the potential of individuals and teams.

Q65. In computerization investment planning, which of the following is an explanation of the ROI that is an evaluation index for investment value?

- a) ROI is a measure that indicates market competitiveness in the case where a project is not implemented.
- b) ROI is a measure that is calculated by dividing the profit generated through factors, such as sales increase and cost reduction, by the amount of investment.
- c) ROI is a measure that is calculated by subtracting the current value of cash outflow from the current cash inflow.
- d) ROI is a measure that is obtained by comparing some parameters, such as the sales to investment ratio and the amount of investment per employee, with other companies.

Q66. Which of the following is the most appropriate action to be taken in order to eliminate the “digital divide”?

- a) Estimating IT investment, setting effect targets based on investment goals, and performing prior evaluation of the feasibility of achieving each effect target
- b) Increasing learning opportunities for information literacy, and preparing an environment to further facilitate the use of information and telecommunications equipment along with information services
- c) Reducing energy consumption by promoting the efficiency of business operations, including telecommuting and energy saving of the daily life field such as electrical appliances and facilities with the help of IT
- d) Using IC tags to enable the tracking of distribution information on products and foodstuffs, in all processes from production to final consumption or disposal

Q67. According to “competitive strategy” proposed by Philip Kotler, which of the following is the company that has a small market share, but has the strategic aim of increasing income and acquiring a unique position by focusing management resources on particular products and services?

- a) Market challenger
- b) Market follower
- c) Market leader
- d) Market nicher

Q68. When the effect of improvement is quantitatively evaluated, a weighted overall evaluation is used as a method of integrating and quantifying the results of the evaluation of multiple items. Which of the following is the improvement proposal that should be prioritized in the table below?

Evaluation items	Weighting factor of evaluation item	Improvement proposals			
		Proposal 1	Proposal 2	Proposal 3	Proposal 4
Labor saving	4	6	8	2	5
Shortening of timeframe	3	5	5	9	5
Reduction of resources	3	6	4	7	6

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

Q69. Which of the following is the business management technique that is used to develop specific targets and measures to implement a planned strategy, in consideration of the appropriate mutual relationships among four perspectives (i.e., financial, customer, internal business processes, and learning and growth)?

- a) Balanced score card
- b) Growth matrix
- c) Product portfolio management
- d) SWOT analysis

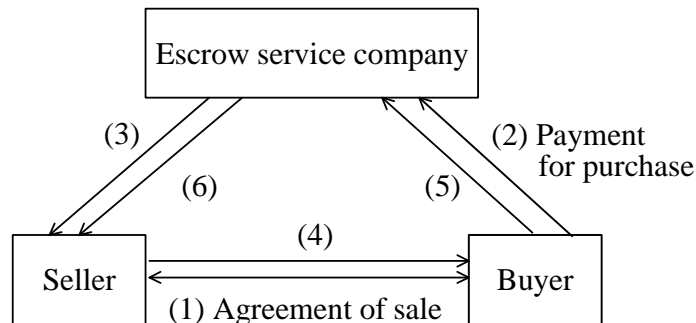
Q70. Which of the following is an explanation of the long tail?

- a) The long tail refers to the ability to sell products on one's own website by shipping products directly from the manufacturer or wholesaler without taking the risk of inventory.
- b) The long tail refers to the integrated and systematic management, delivery, and other handling of the text, images, and such other digital content that make up web content.
- c) The long tail refers to the payment of a referral fee by a company when its product is purchased via a link to the company on a website or blog.
- d) The long tail refers to the situation where the sales percentage for a group of poor-selling products cannot be ignored in terms of the total sales of Internet shopping.

Q71. Which of the following is the purpose of SCM?

- a) To construct favorable customer relationships through unified management, including customer information, purchasing history, and complaints, and also through meticulous customer response
- b) To improve management efficiency through integrated management of all information concerning core business operations such as production, sales, inventory, and accounting
- c) To improve the efficiency of sales activity through unified management of customer information, business meeting schedules, and business meeting status including progress status
- d) To reduce costs and shorten delivery periods through integrated management of information across multiple companies or organizations from procurement to sales

Q72. The figure below shows the transaction model of an escrow service that is used on an Internet auction site or such other transaction. Which of the following is the action that corresponds to (5) in this figure? Here, (1) through (6) indicate the sequence of transactions, and each of (3) through (6) corresponds to one of a) through d).



- a) Notice of deposit of payment
- b) Notice of receipt of product
- c) Shipment of product
- d) Transfer of payment

Q73. Which of the following is an explanation of RFID?

- a) RFID is a combination of an extremely small integrated circuit and an antenna, which is used for an electronic tag that enables an object to be identified and located by using the wireless automatic recognition technique.
- b) RFID is a method of settlement that is based on monetary value saved on an IC card or a cell phone, and is used in a POS register or such other device.
- c) RFID is a technique that uses bio-information, such as the physical characteristics of human beings, for the identification and authentication of individuals, and includes fingerprint authentication and vein authentication.
- d) RFID is used to represent information in a monochrome lattice pattern, and can save a large amount of information including alphanumeric characters and double-byte characters.

Q74. Which of the following is a chart or a diagram that is used to analyze possible relationships between two variables and is composed of a horizontal axis containing the measured values of one variable and a vertical axis representing the measurements of the other variable?

- a) Cause-and-effect diagram
- b) Control chart
- c) Pareto chart
- d) Scatter diagram

Q75. When the relationship between the list price of a product and the demand for the product is defined as a linear expression, which of the following is an appropriate numerical value to be inserted into blank A below?

- (1) When the list price is set to 30 dollars, demand is 0 units.
- (2) When the list price is set to 10 dollars, demand is 60,000 units.
- (3) When the list price is set to 15 dollars, demand is

A

 units.

- a) 30,000
- b) 35,000
- c) 40,000
- d) 45,000

Q76. Which of the following is the forecasting technique that performs the procedure below in order to address problems that involve future prediction difficult to make by using other techniques?

[Procedure]

- (1) Select some experts as respondents to questions.
- (2) Aggregate the responses to questions for use in feedback, and ask questions again.
- (3) Process the responses statistically, and present the responses together with their distribution.

- a) Cluster analysis method
- b) Cross-section method
- c) Delphi method
- d) Monte Carlo method

Q77. As shown in the table below, a factory manufactures the three types of products: X, Y, and Z. How much is the maximum possible profit in dollars? Here, there is an upper limit of the monthly demand for each product. Also, the factory can be used up to 200 hours per month for product assembly, but multiple products cannot be assembled in parallel.

	Product X	Product Y	Product Z
Profit per unit (dollars)	18	25	30
Assembly time required per unit (minutes)	6	10	15
Limit of monthly demand (units)	1,000	900	500

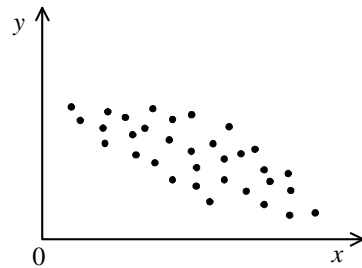
- a) 6,250 b) 30,000 c) 31,500 d) 33,000

Q78. Which of the following is the form of organization that has the characteristics (1) through (4) described below?

- (1) The organization is formed by assembling necessary experts from all departments to achieve strategic objectives.
- (2) The organization is a strategic organization that responds to changes in the environment, and is independent of functional departments.
- (3) The organization has the flexibility to dissolve if the expected objectives are achieved.
- (4) A task force team belongs to this form of organization.

- a) Divisional organization b) Line and staff organization
c) Matrix organization d) Project organization

Q79. The relationship between the value “ x ” of a certain factor in the manufacture of a product and the value “ y ” of a quality characteristic for the product is plotted as shown in the figure below,. Which of the following can be understood from this figure?



- a) In order to estimate y from x , a quadratic regression coefficient needs to be calculated.
- b) The correlation coefficient of x and y is negative.
- c) The correlation coefficient of x and y is positive.
- d) The regression expression for estimating y from x is the same as that for estimating x from y .

Q80. Which of the following is **not** protected by “copyright” that is based on the WTO’s Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)?

- a) Database
- b) Free software publicly available on the Internet
- c) Programming language and its conventions
- d) Software operation manual