April 2017

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?

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

    Since the correct answer is "b)" (April), mark your answer sheet as follows:

    [Sample Answer]

Q1	ⓐ	●	ⓒ	ⓓ

Do not open the exam booklet until instructed to do so.

**Inquiries about the exam questions will not be answered.**

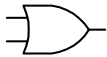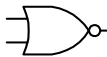---
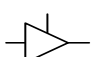
Symbols commonly used in questions

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/IEC25010:2011
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: A small circle or "bubble" on either the input or the output
terminal shows inversion or negation of the logic state.

Q1. For an 8-bit binary number, which of the following sets the middle 4 bits to 1s while inverting the remaining bits?

   a) Performing a bitwise AND operation with 00111100
   b) Performing a bitwise NAND operation with 11000011
   c) Performing a bitwise OR operation with 11000011
   d) Performing a bitwise XOR operation with 00111100

Q2. Which of the following is logically equivalent to the expression below? Here A, B, C, and D are integers, '<' is a less-than operator, and '$\leq$' is a less-than-or-equal-to operator.

$$\text{not } ((A \leq B) \text{ or } (C < D))$$

   a) $(A < B)$ and $(C \leq D)$ b) $(A < B)$ or $(C \leq D)$
   c) $(B < A)$ and $(D \leq C)$ d) $(B < A)$ or $(D \leq C)$

Q3. There are 16 cards numbered from 1 to 16. When four cards are randomly chosen at the same time, what is the probability that all of them are even?

   a) $\dfrac{1}{26}$ b) $\dfrac{1}{24}$ c) $\dfrac{1}{20}$ d) $\dfrac{1}{16}$

Q4. For two sets A and B of cardinalities 3 and 2, how many maps from A to B exist?

   a) 1   b) 5   c) 8   d) 9

Q5. The expression shown below is written in postfix (reverse Polish) notation. What is the value of this expression? Here, the numbers are in decimal, and the symbols '+', '−', '*', and '/' represent addition, subtraction, multiplication, and division operators.

```
100  5  6  2  +  *  12  4  /  −  −  36  −
```

   a) 18   b) 21   c) 27   d) 5

Q6. In the binary tree shown below, where is the position for a new node of value 17? Here, each circle represents a node of the tree and the number in the circle represents its value.
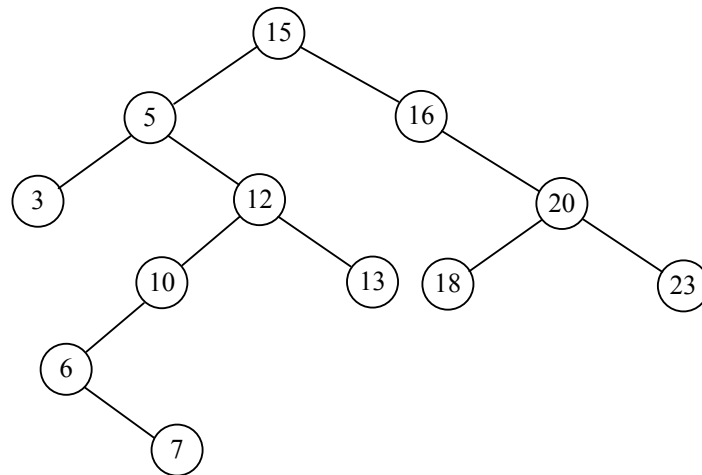
a) Left child of 16

b) Left child of 18

c) Right child of 13

d) Right child of 3

Q7. Which of the following is the output of the flowchart below?
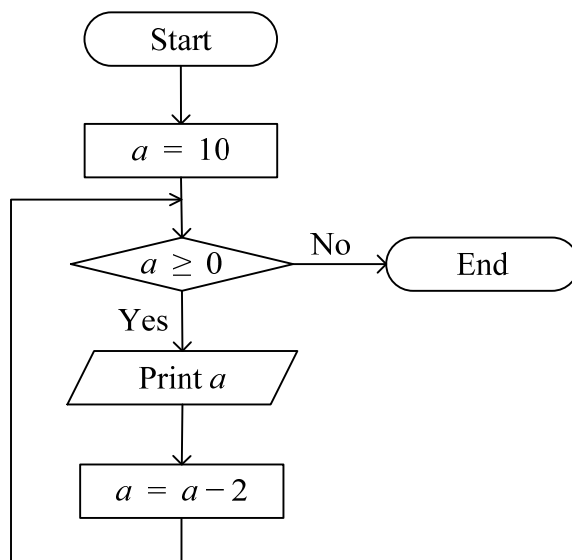
a) 0 1 2 3 4 5 6 7 8 9 10

b) 0 2 4 6 8 10

c) 10 8 6 4 2 0

d) 10 9 8 7 6 5 4 3 2 1 0

Q8. For a two-dimensional integer array a, whose element $a(i, j)$ is of value $2i + j$, what is the value $a(a(1,1) \times 2, a(2, 2) + 1)$?

    a) 12   b) 13   c) 18   d) 19

Q9. A recursive function $f(n)$ is defined as follows for any natural number n. What is the value $f(5)$?

$$f(n) = \begin{cases} 1 & (n \leq 1) \\ n + f(n-1) & \text{(otherwise)} \end{cases}$$

    a) 6   b) 9   c) 15   d) 25

Q10. Which of the following is the addressing mode where the instruction contains the address and the address is modified by a value from another register?

a) Direct addressing mode   b) Indexed addressing mode
c) Memory indirect addressing mode   d) Register indirect addressing mode

Q11. Which of the following is the computer architecture where processors execute multiple instruction streams on multiple data streams in parallel?

    a) MIMD   b) MISD   c) SIMD   d) SISD

Q12. Which of the following is an appropriate explanation of memory interleaving?

a) It allows CPU to access different banks of the main memory simultaneously.
b) It improves CPU performance by connecting I/O interface directly to the main memory.
c) It makes use of a fast memory between the CPU and the main memory, which serves as a buffer for frequently accessed data.
d) It widens the data bus to read or write several bytes between the CPU and the main memory in a single process.

Q13. Which of the following is an appropriate role for a device driver?

a) It decides the next task to be executed from tasks waiting for execution.

b) It directly controls hardware according to requests from an application program.

c) It interprets command strings that are entered by the user, and starts the applicable program.

d) It manages the display status on the screen in multiple windows.

Q14. Which of the following is an appropriate term to describe the phenomenon when files produced in the process of saving are scattered to different parts of the whole hard disk rather than in continuous clusters?

a) Contiguity   b) Fragmentation   c) Sector   d) Segmentation

Q15. Which of the following is the most appropriate explanation of grid computing?

a) A computing task is distributed to several computers in the network to attain the computational capacity.

b) Physical devices such as computers or network devices are emulated to circumvent compatibility constraints and attain software portability and flexibility.

c) Requirements are stated as constraints on response time and/or on the temporal validity of sensory data.

d) Sensing devices are connected to a network to provide feedback and control through personal mobile devices.

Q16. Consider a RAID 0 (i.e., block-level striping without parity or mirroring) system with two disks; when data is distributed evenly across the two disks and both disks have a failure rate of 0.1%, what is the overall failure rate (as a percentage) of this RAID system? Here, the overall failure rate refers to the probability that the system fails to obtain data from either of the disks.

a) 0.0001   b) 0.0100   c) 0.1999   d) 1.9990

Q17. Which of the following is an appropriate description concerning MTBF and MTTR?

a) MTBF of a system decreases and MTTR of a system increases through remote maintenance.
b) MTBF of a system increases as the number of device types that constitutes the system increases.
c) MTBF of a system increases through preventive maintenance.
d) MTTR increases because of functions such as an error log or an instruction trace.

Q18. Round robin (with a time allocation of 3 seconds) is used as a scheduling method for three processes in the order of P_1, P_2, and P_3, shown in the table below. What is the total waiting time (in seconds) of P_3 that elapses before its execution completes? Here, the arrival time is the time at which a process joins the ready queue.

Unit: seconds

Process	Execution time	Arrival time
P_1	24	0
P_2	15	10
P_3	12	13

a) 35   b) 38   c) 45   d) 48

Q19. In virtual memory management, which of the following page replacement methods replaces the page for which the most time has passed since it was last used?

a) FIFO   b) LFU   c) LIFO   d) LRU

Q20. The methods for representing the results of syntactic analysis in a compiler include quadruplet format.

(Operator, Operand 1, Operand 2, Result)

This format indicates that the application of the operator to operand 1 and operand 2 outputs the result. For which of the following expressions does the series of quadruplets below represent the syntactic analysis? Here, T_1, T_2, and T_3 indicate temporary variables.

```
(*,B,C,T₁ )
(/,T₁ ,D,T₂ )
(+,A,T₂ ,T₃ )
```

a) A+B*C/D

b) A+B*C/T2

c) B*C+A/D

d) B*C+T1/D

Q21. ABC company applies a three-generation backup policy. The ABC company's system automatically performs full back up on the 10th, 17th, and 25th of each month. If the latest back up was performed on 17th September, what is the date that the oldest information was backed up?

a) 17th August

b) 25th August

c) 10th September

d) 17th September

Q22. Which of the following is a method that performs integration of the modules that configure a program during execution of the program?

a) Dynamic linking

b) Interpreter

c) Overlay

d) Static linking

Q23. Which of the following is a characteristic of DRAM?

a) Even if the power supply is cut, it can retain stored data.

b) Memory refresh to retain stored data is not necessary.

c) The memory cell structure is simple, so high integration is possible and a low price per bit can be achieved.

d) Writing and erasing data are performed in blocks or in a whole chip.

Q24.   Which of the following is the logical circuit that generates "1" as the output signal Z, only when the input signals X and Y have the same value?

a)

b)

c)

d)
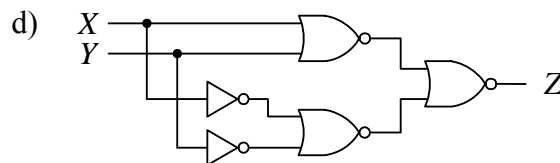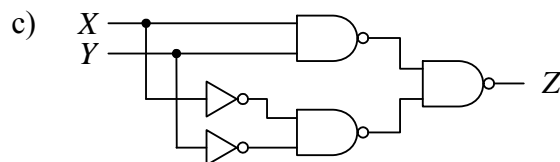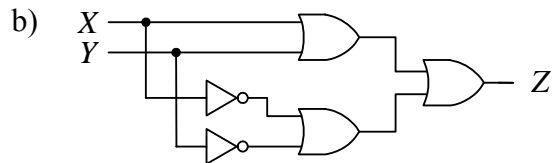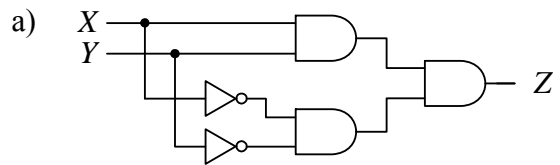
Q25.   Which of the following logic circuits meets the condition described below?

[Condition]
A light is turned on and off by using switches A and B located at the top and bottom of the stairs. The light can be turned on and off by using one switch, regardless of the status of the other switch.
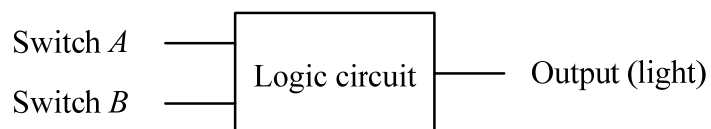
a) AND   b) NAND   c) NOR   d) XOR

Q26. Which of the following is an appropriate explanation of clipping in 3D graphics processing?

a) It is a method to selectively enable or disable rendering operations within a defined region of interest.

b) It is a process of altering the colors of an object based on the angle of the surface to the light sources to produce a photorealistic effect.

c) It is a technique to reduce the prominence of jaggies by surrounding the stair steps of edge lines with intermediate colors.

d) It is the last phase of CG production to render the object data to be visualized on the screen.

Q27. Which of the following is a database design that consists of multiple tables, with rows and columns that are linked together through matching data stored in each table?

a) Hierarchical database
b) Network database
c) Object-oriented database
d) Relational database

Q28. Which of the following is an appropriate explanation of schema in RDBMS?

a) It is a collective term for database operations, such as insert, update, deletion, and selection of data.

b) It is a collective term for various constraints for maintaining consistency of the database.

c) It is a set of data definitions, such as the nature of data, the format of data, and the relation with other data.

d) It is not a real table, but a virtual table from the users' viewpoint.

Q29. Which of the following is an appropriate normalization form (NF) used in a relational database in which every non-prime attribute must be dependent only on the primary key, and no non-prime attribute is dependent on another non-prime attribute?

a) 1NF
b) 2NF
c) 3NF
d) BCNF

Q30. Among the phases of database design, which of the following phases involves the creation of an ER diagram?

a) Conceptual design of databases phase
b) Distributed design of databases phase
c) Logical design of databases phase
d) Physical design of databases phase

Q31. Which of the following SQL statements for the table "ShipmentRecord" obtains the largest value?

ShipmentRecord

ProductNumber	Date	Quantity
NP200	2015-10-10	3
FP233	2015-10-10	2
NP200	2015-10-11	1
FP233	2015-10-11	2

a) `SELECT AVG(Quantity) FROM ShipmentRecord WHERE ProductNumber = 'NP200'`
b) `SELECT COUNT(*) FROM ShipmentRecord`
c) `SELECT MAX(Quantity) FROM ShipmentRecord`
d) `SELECT SUM(Quantity) FROM ShipmentRecord WHERE Date = '2015-10-11'`

Q32. Which of the following is a routable IP address in the Internet?

a) 10.129.205.3
b) 172.40.77.4
c) 192.168.10.7
d) 192.168.203.5

Q33. Among the seven layers of the OSI basic reference model, which layer is responsible for forwarding packets, including routing them through intermediate routers?

a) The data link layer
b) The network layer
c) The session layer
d) The transport layer

Q34. In an IPv4 network, which of the following is the correct combination of an IP address class, its IP address range, and a subnet mask?

	class	range	subnet mask
a)	class A	1.0.0.0 ~ 127.255.255.255	255.0.0.0
b)	class B	128.0.0.0 ~ 191.255.255.255	255.255.0.0
c)	class C	192.168.0.0 ~ 223.255.255.255	255.255.255.0
d)	class D	224.0.0.0 ~ 239.255.255.255	255.255.255.255

Q35. Which of the following is an Internet service that translates a domain name such as **www.itpec.org** into its corresponding IP address?

a) ARP b) DNS c) RARP d) TCP

Q36. Which of the following is an appropriate description of the *netstat* utility?

a) It displays active TCP connections.
b) It displays the contents of the DNS resolver cache.
c) It displays the mapping between IP addresses and corresponding MAC addresses in the cache.
d) It displays the route path to the specified destination and measures the packet delays.

Q37. Alan would like to send an encrypted message to Bob using an asynchronous encryption scheme. Which of the following must occur before Alan sends the encrypted message to Bob? Here, Alan has already proven to Bob with the digital signature that Alan is the person who sends the message to Bob.

a) Alan provides his private key to Bob.
b) Alan provides his public key to Bob.
c) Bob provides his private key to Alan.
d) Bob provides his public key to Alan.

Q38. Which of the following is an appropriate term associated with the fraudulent action of impersonating an authorized person?

a) Destruction   b) Falsification   c) Spoofing   d) Tapping

Q39. An attacker calls a corporate help desk, masquerading as an employee who has lost their password. The help desk staff resets the password to the company default "password1." The attacker then uses this password to access the company network and information in the server. What is this type of attack called?

a) Buffer overflow attack   b) Denial-of-Service attack

c) Shoulder surfing   d) Social engineering

Q40. A man-in-the-middle attack happens when an attacker intercepts communication and spoofs the identities of either of the two parties involved. How can such an attack be effectively countered?

a) Such an attack can be countered by a cyclic redundancy check (CRC).

b) Such an attack can be countered by having an authentication through a digital signature before accepting someone's public key.

c) Such an attack can be countered by using a parity bit.

d) Such an attack can be countered by using hashing algorithms.

Q41. Bob and Alice encrypt all of their communications with each other. Because of the high level of sensitivity of the information they are sharing, they have implemented a cryptographic mechanism that offers secrecy to their messages. However, the trade-off of this encryption is that it is impossible for Bob or Alice to be 100% sure that they are communicating with each other, nor can they be 100% certain of the integrity of the content of the messages. Which of the following types of encryption methods are Bob and Alice using?

a) AES (Advanced Encryption Standard)   b) DES (Data Encryption Standard)

c) One-time pad   d) Stream cipher

Q42. A user has just received a file named "image.jpg." When inspected more closely, it is revealed that the file name is actually "image.jpg   .exe," with spaces between the fake .jpg suffix and the real .exe suffix. Which of the following is the most appropriate term used to describe this type of attack?

a) Backdoor   b) Trojan horse   c) Virus hoax   d) Worm

Q43. A data backup system must support restoring all transactions until 5 minutes before a disaster happens. What type of goal is this?

a) Maximum tolerable downtime   b) Recovery point objective
c) Recovery time objective   d) Service level agreement

Q44. Which of the following is an appropriate test to verify the efficacy of security measures by attempting an actual intrusion?

a) Exception test   b) Functional test
c) Penetration test   d) Stress test

Q45. Which of the following is an appropriate method to prevent a buffer overflow attack?

a) Performing input filtering and removing browser scripts from all user input on web applications
b) Performing input filtering and removing structural query language commands from all user input
c) Performing the boundary check on all integer variables in the program to confirm that the resulting value from each calculation does not exceed the limit of its destination variable
d) Performing the boundary check on all string variables in the program to confirm that the length of the input string does not exceed the size of the designated variable

Q46. Companies usually provide a means for their mobile workforce to access the corporate network securely over the Internet through insecure channels such as open wireless networks in hotels or coffee shops. Which of the following is the appropriate technology that can be used for this purpose?

a) DMZ (DeMilitarized Zone)
b) SNMP (Simple Network Management Protocol)
c) VoIP (Voice over Internet Protocol)
d) VPN (Virtual Private Network)

Q47. Which of the following are components of a UML2.x (including 2.0 and later versions) state diagram?

a) Message and Activity
b) Message and Transition
c) State and Message
d) State and Transition

Q48. As shown in the list below, there are three types of coupling. Which of the following is the most appropriate combination of the type of coupling?

Coupling A: One module passes an element of control to the other module.

Coupling B: One module passes the data structure as a parameter to the other module.

Coupling C: Two modules have access to the same global data.

	Coupling A	Coupling B	Coupling C
a)	Content coupling	Data coupling	Common coupling
b)	Content coupling	Stamp coupling	External coupling
c)	Control coupling	Data coupling	External coupling
d)	Control coupling	Stamp coupling	Common coupling

Q49. Which of the following is an appropriate description concerning test data for the black box testing?

a) Test data is created based on branch coverage.
b) Test data is created based on condition coverage.
c) Test data is created based on external specification.
d) Test data is created based on program structure.

Q50. When a software component is tested, which of the following is an appropriate combinations of X and Y?

X : It calls the software component to be tested.
Y : It is called from the software component to be tested.

	X	Y
a)	component	unit
b)	driver	stub
c)	stub	driver
d)	unit	component

Q51. According to the Capability Maturity Model Integration, which is the final stage and has the highest level of maturity?

a) Auditable   b) Custom   c) Optimized   d) Quantitative

Q52. According to PMBOK, which of the following combinations of processes pertains to project integration management?

A. Control costs
B. Develop project charter
C. Direct and manage project work
D. Identify risks
E. Manage communications
F. Perform integrated change control

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

Q53. According to PMBOK, which of the following is an appropriate explanation concerning the scope creep in project scope management?

a) A hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables.

b) Any change to the project scope. It almost always requires an adjustment to the project cost or schedule.

c) The sum of the products, services, and results to be provided as a project.

d) The uncontrolled expansion to product or project scope without adjustments to time, cost, and resources.

Q54. As shown in the arrow diagram below, there is a project consisting of eight activities A through G.   Which of the following is the appropriate combination of the earliest finish time (EFT) and latest start time (LST) of activity G?

A 30
C 20
E 15
F 15
H 7
B 10
D 15
G 20

Legend

Activity name

Number of days required

----→: Dummy activity
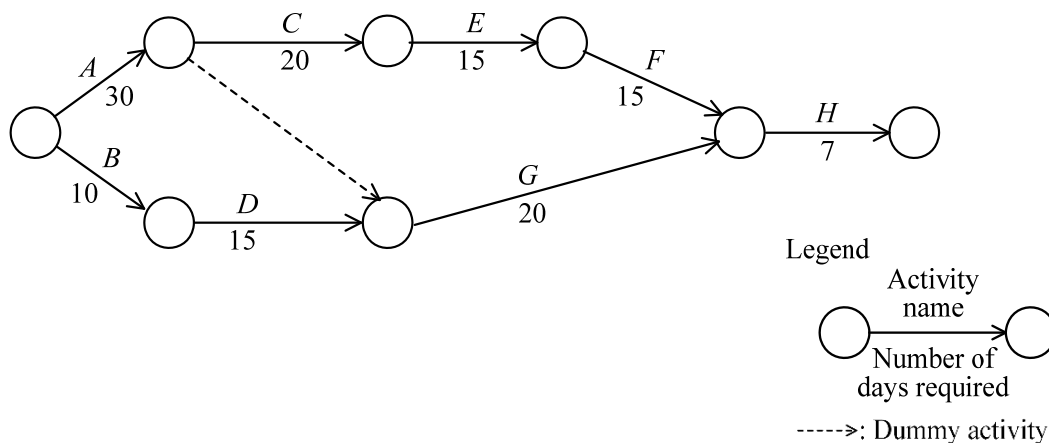
	EFT	LST
a)	30	60
b)	30	80
c)	50	60
d)	50	80

Q55. According to EVM (Earned Value Management), the budget of a software development project is $10,000 and the project duration is planned for 10 weeks. After 4 weeks, it is revealed that only 30% of the work has been completed against a cost of $4,200. What is the cost performance index?

a) 0.126   b) 0.300   c) 0.420   d) 0.714

Q56. According to the ISO/IEC 20000-1, which of the following is a service delivery process that the service provider shall agree the services to be delivered and shall agree a catalogue of services with the customer?

a) Capacity management
b) Information security management
c) Service continuity and availability management
d) Service level management

Q57. According to ITIL, which of the following is an activity or process in the Service Transition?

a) Assessing the IT recovery options of the new IT infrastructure considering the business risks and cost to the project
b) Classifying events once it is detected and communicating specific information to corresponding groups as an immediate action
c) Defining the reliability and service life of the IT infrastructure considering projected growth in the service
d) Implementing multiple strategies such as web seminars, newsletters, and visualization in transferring knowledge

Q58. Which of the following is an appropriate description of the relationship between a record of an incident and a record of a problem in IT service management?

a) If known errors have been specified at the time of ending the record of the problem, the record of the incident that acts as the beginning of the record of the problem is deleted.
b) One (1) record of a problem is always associated with one (1) record of an incident.
c) Problems are classified and recorded by a different criterion from the classification of incidents.
d) The cross-referenced information of the incident that acts as the beginning of the record of the problem is included in the record of the problem.

Q59. Which of the following is an appropriate activity that is undertaken by a system auditor who audits access control?

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

Q60. Which of the following is a checkpoint during audit of a control for reducing the risk of system trouble during the application of a software patch?

a) A database administrator is appointed, and the management procedures of master data are specified.
b) A hardware management ledger is created, which is managed by system administrators.
c) System operation is properly checked before commencing full-time operations.
d) The procedures of capacity planning are specified.

Q61. When data sheets issued by a business operations department are entered in a system in an information system department, which of the following is an appropriate task executed by the information system department?

a) The data sheets are retained in the information system department until the due date for processing, and confirmation including a check of the number of sheets received is performed for all sheets collectively just before the due date.

b) To enable the business operations department to check the processing results of each data sheet, the processing results list is sent to the business operations department.

c) To prevent unauthorized use or leakage of confidential information, data sheets are disposed of immediately after completion of data entry.

d) When the data sheet contains an error, and only when the error is obvious, the data sheet is corrected and an entry is made at the judgment of only the person in charge of data entry.

Q62. Which of the following is an appropriate feasibility evaluation when checking whether the lifetime benefits of the proposed information system is greater than its lifetime costs?

a) Economic feasibility

b) Operational feasibility

c) Scheduling feasibility

d) Technical feasibility

Q63. Which of the following is a usage scenario for the adoption of UML as a technique for visualizing business processes?

a) Diagrams are shown by using a data-oriented approach where objects are handled as entities, their attributes, and the relationships among the entities.

b) To represent processes by using data flows, sources and sinks of data, data stores, and data processes are connected with arrows that indicate data flow.

c) To represent processes from multiple viewpoints, some purpose-specific modeling methods are used, and each model is depicted by using standardized notation rules for object modeling.

d) To thoroughly represent the functions of a process, the events that occur in response to a single request are described by using the conditional branch format.

Q64. Among the "four categories" of the enterprise architecture, which of the following completes the list after business architecture, technology architecture, and application architecture?

a) Bus architecture

b) Data architecture

c) Software architecture

d) System architecture

Q65. Which of the following is an appropriate explanation of EMS?

a) It refers to acting as the customer service desk for responding by telephone to consumer electronics-related inquiries from general consumers.

b) It refers to planning, design, and development of products without owning manufacturing facilities.

c) It refers to the contract production of electronic devices, etc. ordered by other manufacturers.

d) It refers to the dedicated selling of electronic devices, etc. purchased from other manufacturers.

Q66. Which of the following is an explanation of green procurement?

a) It refers not only to the fulfillment of the requirements of quality and price, but also to the preferential purchase of products and services that exert a lower environmental burden from companies working towards a reduction in environmental burden.

b) It refers to a certificate that enables commercial trading of the green power generated from natural energy such as sunlight, biomass, wind power, and geothermal heat.

c) It refers to international standards concerning environmental labels such as eco marks that are qualified by a third party based on a certain standard.

d) It refers to mass promotion of the details of environmental protection activities, and the raising of funds from investors.

Q67. Which of the following is an appropriate description of an RFI?

a) It is a document describing the basic policy for the system, including a summary of the system, the purpose, the necessary functions, the system requirements, and contract matters.
b) It is a document that is created after an RFP.
c) It is a document used by companies looking for implementation of computerization to request specific system proposals from prospective suppliers such as system vendors.
d) It is a document used to request information concerning computerization from prospective suppliers such as system vendors.

Q68. Companies are classified based on their competitive position in the market. There are typically four types: leader, challenger, follower, and nicher. Which of the following is an appropriate characteristic of the strategy of a leader?

a) A full frontal matching attack against the competitor's product, advertising, price and distribution, or indirect attack on the competitor's weaknesses or on gaps in the competitor's market coverage
b) Capturing a specific market that is not targeted by a high-ranking company and concentrating management resources for securing and maintaining the predominance in the market
c) Determining the real ability of the challenger company in the market, and giving priority for securing stable profits rather than expanding the market share by doing as the leader company does
d) Proposing a new product and its usage method to the consumer to expand the total demand while maintaining or expanding the market share

Q69. Which of the following is a marketing technique to create demands from consumers by using advertisements that improve the brand image of a company or a product?

a) Direct marketing
b) Relationship marketing
c) Pull strategy
d) Push strategy

Q70. PEST analysis is used for analyzing the external environment in determining a business strategy. What are the external environmental factors the PEST analysis analyzes?

a) Politics, Economics, Society, Technology
b) Politics, Enterprises, Society, Time
c) Price, Economics, Satisfaction, Technology
d) Price, Enterprises, Safety, Time

Q71. Which of the following is an explanation of the IoT (Internet of Things)?

a) It refers to a form of electronic commerce carried out over the Internet, consisting of a typical C to C transaction by which a seller posts a product's name, photo, minimum selling price, and other information on a website, after which the bidder that offers the highest amount within the time limit becomes the successful bidder.
b) It refers to data centers designed for the connection to the Internet, with server operation failure prevented through the implementation of measures including quality management of communication lines, server maintenance, air conditioning, and power source-related countermeasures against power interruptions and outages.
c) It refers to Internet advertising such as a banner advertisement that displays an image, with a link to an advertiser's website, or an e-mail advertisement that publicizes an advertiser's website.
d) It refers to the installation of communication functionality to various objects, in addition to information and communication devices, and enabling automatic recognition or remote measurement by connecting these to the Internet, to achieve high-level decision-making services and automated control through the collection and analysis of large volumes of data.

Q72. Which of the following is an explanation of benchmarking used for corporate management?

a) It refers to a qualitative and quantitative understanding of a company's own products, services, and operation through comparison with those of competitors or advanced companies.

b) It refers to drastically reforming the quality and structure of a company by redesigning its business processes from a customer viewpoint and by taking full advantage of information technology.

c) It refers to the ability to plan and manage the allocation of company-wide management resources in an effective and integrated manner and to achieve an improvement in management efficiency.

d) It refers to the concentration of management resources on the unique skills and technologies of a company that can generate profit and that are superior to those of other companies.

Q73. Which of the following is an explanation of the long tail?

a) Generally known as the 80:20 empirical rule, the name derives from the phenomenon by which 80% of a company's sales are accounted for by the best-selling 20% of its products, or by which 80% of a company's losses due to quality defects are accounted for by the top 20% of all causes of defects.

b) If "value of network" is determined as the usefulness of the mutual access by the subscribers of the network," then the value of the network is approximately proportional to the square of the number of users.

c) It enables a company to share the management resources through conducting multiple business activities simultaneously, and through the effective use of the shared resources, to relatively reduce the cost rather than conducting each business independently.

d) It is effective in reducing the risk of opportunity loss in an online shop that uses the Internet by lining up a broad range of items, including products for which sales opportunities are few.

Q74. Which of the following performs processing according to steps (1) through (3)?

(1) Based on the types and quantities as well as the parts list of the product planned to be manufactured in a fixed period of time in the future, the required quantity of components is calculated.

(2) The net order quantity of each component is calculated from the amount of inventory that can be allocated.

(3) The ordering time of the components is determined while considering the manufacturing and procurement lead time.

a) CAD (Computer Aided Design)   b) CRP (Capacity Requirements Planning)
c) JIT (Just In Time)   d) MRP (Material Requirements Planning)

Q75. Which of the following is the procurement process that enables suppliers to bid against one another on the Internet to sell their products or services under the conditions specified by a general customer?

a) B to B   b) G to C
c) Reverse auction   d) Virtual mall

Q76. Which of the following is a management organization that has a characteristic of both project and functional organizations to flexibly respond to changes in the business environment?

a) Divisional organization   b) Hierarchical organization
c) Line and staff organization   d) Matrix organization

Q77. Company A has two media plans. One plan is for a series of 30-second radio advertisements (ads) and the other is for 60-second TV ads. Exposure is rated in points. The company is considering an exposure of at least 60 points in the city and at most 40 points outside the city. The table below shows the cost and exposure of both TV and radio ads. Which of the following is the set of expressions that can determine the number of media ads to minimize the total cost?

	Cost	In the city exposure (points)	Outside the city exposure (points)
TV ads	2000	8	6
Radio ads	800	10	3

a) Conditions $8x + 6y \geq 60$, $10x + 3y \leq 40$, $x \geq 0$, $y \geq 0$
Objective function $2000x + 800y \rightarrow$ minimize
b) Conditions $8x + 10y \geq 60$, $6x + 3y \leq 40$, $x \geq 0$, $y \geq 0$
Objective function $2000x + 800y \rightarrow$ minimize
c) Conditions $8x + 6y \leq 60$, $10x + 3y \leq 40$, $x \geq 0$, $y \geq 0$
Objective function $2000x + 800y \rightarrow$ minimize
d) Conditions $8x + 10y \leq 60$, $6x + 3y \leq 40$, $x \geq 0$, $y \geq 0$
Objective function $2000x + 800y \rightarrow$ minimize

Q78. When the FIFO method is applied to the purchase and selling record shown below, what is the inventory value at the end of March?

			Units	Purchase price per unit	Selling price per unit
March	1	Stock held	400	0.4	
	4	Purchased	600	0.42	
	8	Sold	500		0.6
	10	Purchased	500	0.43	
	15	Purchased	800	0.42	
	20	Sold	1000		0.6
	24	Purchased	200	0.44	
	30	Sold	500		0.6

a) 214   b) 241   c) 300   d) 880

Q79. Which of the following is a method of making decisions based on the discount rate at which the net present value of the payback amount and the investment amount are equal?

a) Internal Rate of Return method
b) Net Present Value method
c) Payback Period method
d) Return on Investment method

Q80. Which of the following is **not** protected by "copyright" that is based on the World Trade Organization'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