

SCOPE OF QUESTIONS

FOR THE

**FUNDAMENTAL OF
INFORMATION TECHNOLOGY
PROFESSIONAL EXAMINATION
(FITPE)**

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■ Scope of questions

Examinations in the morning are given to test each examinee about the knowledge required in each examination category and determine whether he or she has reached the “expected level of technical expertise.”

Examinations in the afternoon are given to test each examinee’s ability to apply knowledge and practical knowledge and skills and determine whether he or she has reached the “expected level of technical expertise.”

Examinations in the morning**COMPUTER SCIENCE FUNDAMENTALS**1. *Basic theories of information*

1-1 Numeric and data representation

Radix conversion, numeric representation, character representation, numeric calculation (operation methods and precision, approximate solution and equations, etc.), probability and statistics, optimization problems, etc.

1-2 Information and theories

Logical operation, coding theories, predicate logic, state transition, computational complexity, information content, BNF, Polish notation, set, etc.

2. *Data structures and algorithms*

2-1 Data structures

Binary tree, list, stack, queue, etc.

2-2 Algorithms

Sorting, searching, recursion, graph, character string processing, flowchart, etc.

COMPUTER SYSTEMS1. *Hardware*

1-1 Information element

Types and features of semiconductor devices and integrated circuits, etc.

1-2 Processor architecture

Instruction and addressing, performance/structures/methods/features of processors, etc.

1-3 Memory architectures

Memory cache, memory capacity, memory configuration and characteristics, etc.

1-4 Auxiliary memory

Types and characteristics of storage media and auxiliary storage devices, etc.

1-5 Input/output architecture and equipment

Types and characteristics of input/output interface, peripheral devices, communications devices (router, modem, DSU, etc.), etc.

1-6 Types and characteristics of computers

Structures/types/characteristics of computer (personal computer, work station, etc.), etc.

1-7 Embedded systems

Component parts and construction, logical design, logic circuit, control theory, signal theory, etc.

2. Basic software**2-1 Operating systems**

Virtual storage, multiple programming, storage management, functions/types/characteristics of OS, embedded OS, embedded system design, device driver, etc.

2-2 File management

File organization, access method, exclusive control, recovery processing, retrieval method, etc.

3. System configuration and method**3-1 System configuration technology**

Client/server system, system configuration method and processing modes (duplex configuration, dual configuration, grid computing, ubiquitous computing, SAN, NAS, etc.), etc.

3-2 System performance

System performance calculation, performance design, performance index, performance evaluation, queuing theory, capacity management (cost, resource management, performance management, etc.), etc.

3-3 System reliability and economical efficiency

System reliability calculation, reliability design, reliability indicator, reliability evaluation, economical efficiency, operation rate, failure rate, bathtub curve, etc.

4. *System application*

4-1 Network application

Web, Internet, intranet, extranet, communication services, mobile communication, satellite communication system, protocols (TCP/IP, UDP, IPv6, etc.), structures/types/characteristics of LAN, etc.

4-2 Database application

Data warehouse, data mining, data mart, use of SQL, etc.

4-3 Data resource management

IRDS, meta data, repository etc.

4-4 Multimedia system

AI, pattern recognition, AR/VR/CG, agent, media application, etc.

SYSTEM DEVELOPMENT AND OPERATION

1. *System development*

1-1 Programming languages

Program structure, data type, language processor, syntax analysis, types and characteristics of programming languages (C, COBOL, Java™, SQL, HTML, etc.), etc.

1-2 Software package

Spreadsheet software, groupware, middleware, etc.

1-3 Development environment

Development tools, EUC, EUD, etc.

1-4 Development method

Process model, software development method, etc.

1-5 Requirements analysis and design method

DFD, ER diagram, UML, object-oriented design, process-centered design, data-centered design, module design, input/output design, human interface design, etc.

1-6 Programming, test and review

Programming method, test method, review method, test design and management method, etc.

1-7 Development management

Project planning, estimation method, quality control, process management, schedule management, cost management (earned value, etc.), configuration management, personnel planning and management, document management, roles and organization of development members, presentation technique, communication technique, systems auditability, etc.

1-8 Use of external resources

Outsourcing, system integration, etc.

2. *System operation and maintenance*

2-1 System operation

System failure management, migration, operation, operation tool, resource management, cost management, user management, equipment and facility, etc.

2-2 System maintenance

Forms of maintenance, maintenance contract, software maintenance, etc.

NETWORK TECHNOLOGY

1. Network technology

1-1 Protocol and transmission control

Network architecture, communication protocol and interface, OSI layer, etc.

1-2 Encoding and transmission

Error control, modulation and encoding, multiplexing method, switching system, transmission method, etc.

1-3 Network (LAN and WAN)

LAN, WAN, Internet technology, laws and regulations related to network, telecommunications services, etc.

1-4 Communications equipment

LAN-to-LAN connection equipment, line connection equipment, transmission/switching equipment, communication media, etc.

1-5 Network software

Network management, network OS, etc.

DATABASE TECHNOLOGY1. *Database technology*

1-1 Models of database

Database model, analysis, normalization, manipulation, etc.

1-2 Database language

SQL, etc.

1-3 Database control

Exclusive control/recovery/transaction management of database, distributed database, functions and characteristics of DBMS, etc.

SECURITY AND STANDARDIZATION1. *Security*

1-1 Security

Encryption, authentication, access control, security management, safety measures, computer viruses, privacy protection, security policy, personal information protection, network security, laws and regulations related to security, etc.

1-2 Risk management

Risk analysis, countermeasures against risks, types of risks, internal control, etc.

1-3 Guidelines

Standards for information system safety measures, software management guideline, standard for preventing computer viruses, standard for preventing illegal access to computers, information security audit system, etc.

2. *Standardization*

2-1 Standardization for development and acquisition

ISO 9000, SLCP-JCF98, etc.

2-2 Standardization for information system infrastructure

OSI, IEEE, EDIFACT, OMG, CORBA, RFC, ISMS, ISO/IEC 15408, etc.

2-3 Standardization of data

Various codes (character codes, bar codes, two-dimensional code, etc.), data formats, data compression, etc.

- 2-4 Standardization organizations
Domestic and foreign standardization organizations, etc.

COMPUTERIZATION AND MANAGEMENT

1. *Information strategy*

1-1 Business management

Business strategy, organizations, business management, marketing, behavioral science, system theories, human resource management, etc.

1-2 Computerization strategy

Computerization conception, systematization plan, business improvement/analysis/design, business information system, etc.

2. *Corporate accounting*

2-1 Financial accounting

Accounting standard, financial statements, consolidated accounting, depreciation, etc.

2-2 Management accounting

Break-even point, economy calculation, financial management index, cost, lease and rental, fund plan, finance, asset management, etc.

3. *Management engineering*

3-1 IE and OR

Analysis method (work analysis, process analysis, prediction, inventory control, linear programming, queue, PERT, etc.), quality control (OC curve, control chart, Pareto's chart, etc.), optimization problem, statistical method, etc.

4. *Use of information system*

4-1 Engineering system

MRP, production control system, production plan, process plan and management, etc.

4-2 Business system

Accounting/finance/personnel affairs systems, sales support system, POS, distribution system, financial system, public system, inter-enterprise system, electronic clearing system, etc.

5. *Related laws and regulations*

5-1 Information communication

Telecommunications Industry Law, etc.

5-2 Intellectual property right

Copyright Law, Industrial Property Right Laws, Unfair Competition Prevention Law, etc.

5-3 Labor

Laborer Dispatch Law, Law concerning the Promotion of Equal Opportunity and Treatment between Men and Women, Labor Standard Law, Industrial Safety and Health Law, etc.

5-4 Transactions

Regulations concerning outsourcing, software sales, etc.

5-5 Safety

Illegal Access Prevention Law, Personal Information Protection Act, Product Liability Law, etc.

5-6 Other laws and ethical matters

Criminal laws, Commercial Laws, Electronic Register Retention Law, information disclosure, certification system, etc.

Examinations in the afternoon

Fundamental Information Technology Professional Examination (FITPE)

1. Hardware

Numeric representation, character representation, image/sound representation, processor, memory, I/O device, execution of operation, addressing scheme, I/O process execution, system configuration, etc.

2. Software

System software, application software, software package, OS functions, programming language, language processor, program execution, etc.

3. Algorithm

Sorting, searching, character string processing, file processing, diagram, graph, numeric calculation, etc.

4. Data structure and database

Fundamental data structure, types and features of storage media, file organization methods, types and characteristics of database, database language, data manipulation using SQL, etc.

5. Communication network

Data transmission, transmission control, TCP/IP, LAN, WAN, Internet, email, Web, etc.

6. Information processing technology

System performance, system reliability, risk management, security, standardization, operations research, etc.

7. Program design

System development process, program design process, structured design, module design, program design document, etc.

8. Program development

Programming languages (C, COBOL, JavaTM), coding, development environment, test methods, etc.

Scope of Questions for the Fundamental Information Technology Professional Examination (FITPE)

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