

Questions for the final examination. Business IT Sc

Common questions:

1. Tasks and components of database management systems. Relational data model. Concepts of super key, key, primary key, foreign key, relational database schema. Relational query languages: relational algebra and relational calculi.
2. Entity-relationship model. Degree, cardinality and optionality of relationships. Atomic, composite, single-valued, multi-valued, derived attributes. Constraints. E/R diagrams. Redundancy, decomposition, functional dependency. Normal forms. SQL statements.
3. Method of least squares: modelling of measurements, estimation of parameters with the help of normal equations, resolvability of normal equations, meaning and handling of possible singularities. Interpolation: Lagrange interpolation, theorem about resolvability, Newton form of the Lagrange polynomial.
4. Numerical solution of non-linear equations: bisection, Regular Fails, Newton's and secant method, fixed point iteration. Numerical solution of systems of non-linear equations: Newton's method, fixed point iteration, Gauss-Newton algorithm.
5. Standard linear regression model, method of least squares. Estimators a testing of hypotheses in the regression model. Non-linear regression. Multivariate regression models. Deterministic analysis of time series, estimation of trend and seasonality.
6. Computer security, security threats, physical, administrative and algorithmic controls
7. Administrative security controls: risk management, computer support and operations
8. Product policy, pricing.
9. Promotion, distribution.
10. Financial statement analysis. Financial ratios (leverage, liquidity, efficiency, profitability, market-value ratios).
11. Time value of money (future value, present value, annuity, perpetuity)
12. Fundamentals of procedural programming. (Classification of high level programming languages. Data types, constants, variables. Expressions and statements - like declaration, assignment, operands and operators, precedence. Control structures: two-way decision, multiple-way decision. Loops. Subprograms (functions and procedures). Parameter passing methods.)
13. Fundamentals of Object-oriented programming. (Abstract data type, Classes, objects and hierarchy tree. (Multiple) inheritance. Encapsulation. Exception handling. Explaining the above mentioned topics in one chosen language, like Java, C# or Ada)
14. Frameworks and concepts of financial accounting. The International Accounting Standards, the International Financial Reporting Standards, and the IASB's concepts. The contents of financial statements. Balance sheet, income statement, and cash flow statement. Definitions and rules of double-entry bookkeeping.

15. The most important institutions of the EU and their basic characteristics.
16. The concept and the main services of a modern operating system. The operating systems' evolution process. The main components of a modern operating system: process management (scheduling, synchronization, IPC), memory management (continuous allocation, paging, virtual memory), file management (concepts and implementation, examples: FAT and INODE).
17. The basic concepts of computer networks. The OSI and TCP/IP layered architecture. The roles and the most important functionalities of the layers and protocols in a communication.
18. IPv4 addressing problems and solutions. Class based addressing, CIDR, NAT.
19. The definition and theories of leadership.
20. The key elements of organizational structures. Common organization designs, and new design options. Factors, influencing organizational design.

Specializations

e-Business:

1. Macroenvironmental analysis in international marketing (economic, trade, social and cultural, political, legal, and regulatory environments)
2. Product and brand decisions, pricing, marketing channels and physical distribution, and marketing communications decisions in international marketing
3. International market entry strategies: exporting, licensing, investment, and strategic alliances
4. Encryption schemes, symmetric and asymmetric encryptions, attacks, symmetric encryptions: DES, AES, asymmetric encryptions: RSA, El Gamal algorithms.
5. Digital signature, the DSA protocol, public key infrastructures, key exchange protocols, authentication, secure network protocols.
6. Uniquely decipherable and prefix codes, code trees, Kraft-Fano inequality, average code length, entropy and their relation. Efficiency of codes. Huffman-, Shannon- and Gilbert codes.
7. Measures of information (entropy, conditional entropy, joint entropy) and their properties. Channel capacity.
8. Introduce one possible language for Web application development, like Java EE.
9. List and describe the required elements of an HTML document. After it, list and explain some of the important elements and their basic syntax.
10. Basics of XML-based storage, the XML databases. Explain the most important parts of XPath and XQuery.