Presentation of a Competition in Informatics and IT

Name of the Competition: Olympiad in Information technologies

Area: Information Technologies (IT)

Style of the Competition:

A. Outline of the competition: A combination of Test exam with multiple-choice answers and Demonstration and defense of a project - previously prepared software system.
B. The Olympiad is an individual competition.
C. Financial conditions: free of charge for each competitor
D. The Olympiad has a restricted (two hours) time limit for filling the test during the final stage, and about six months for developing the software system (project).
E. Style of competition: Presence needed (attendance of the participants at an appointed time and place for defending the project and filling the test)
F. Method of evaluation: by grading system with postponed evaluation – tests are graded by two independent evaluators and final scores are made available two or three hours after the end of the test; projects are evaluated by an examination committee based on the well known in advance criteria and final grades are available three to six hours after the end of the project defense stage.
G. The size of the Competition Jury is usually between 6 and 9 experts, appointed by the Minister of the Education and Science. The task of the Jury is to prepare the Rules of the Olympiad (choosing categories for software system development, defining the criteria for project evaluation, and developing a test for the final stage). The Competition Jury is functioning for a period of six months, and is using a special Web site for the organization of the competition (publishing all the relevant information, registering the participants and constant dialogue and communication with all participants via special competition forums).
H. The final stage of the Olympiad is organized with the help of the Local Organizing committee (providing hotel and subsistence for all participants, and providing all the needed technical infrastructure – rooms, Internet connection, etc.)
I. The Olympiad is first announced by the Ministry of Education and Science (MES) as a part of all National Competitions supported by MES. After that most of the information regarding the Olympiad is announced by the special Web site available to support all school competitions in Information Technologies in Bulgaria. Regularly MES is providing information regarding each next stage of the Olympiad.
J. All competition results, tasks, competitor's works and lots of other information is published on the special Web site.
K. Till now the Olympiad was not divided into age groups, but since the last changes in the National School Curriculum for ICT, the Olympiad will be divided into two age groups: students at age till 14 years, and students at age older than 14 years.
L. The winners of the Olympiad received special certificates from the MES, which can be used as an input exam scores in Bulgarian Universities. Each year various sponsors provide also specific awards to the winners like financial support, free Internet connection, and lots of material awards (computer components and accessories, etc.)
M. The Olympiad includes three stages: local (School) stage, regional stage and final stage. During the local stage students defend their project plans, and only students having feasible project plans are allowed to continue. Usually this defense is made before the local jury from local ICT experts. The second stage is defense of the project at Regional level, before

a jury from regional ICT experts. Only projects having more than 75 (out of 100) grades are allowed to go forward. All such projects are further checked for eligibility from the National Jury. The final stage includes two final exams - individual test and defense of projects, and the final score is formed by the scores of these two final exams. During the final stage all grades are appointed by the National Jury.

Target Group: All Bulgarian students participate in the Olympiad – it is open for everyone. Students move from one stage to the next by the results of a previous round (from Town to Regional, and from Regional to National).

Age of Participants: Two age groups: 8-14 and 15-19

School level of Participants: All schools: Primary, Secondary and High schools.

Number of Participants and the number of editions of the competition in the Last 3 Years: The average number of participants during the last three years is 460 per year, starting from the Local stage. Depending on the rules and levels of the participants, between 60 and 100 students go to the final stage each year. National Olympiad is organized once per year, so during the last three years we have three editions.

History of Competition: The National Olympiad started ad an initiative of the MES in 2003, and MES was the principal organizer of the first and the subsequent editions of the Olympiad.

Financial Basis of the competition: The Olympiad is supported financially primarily by the Ministry of Education and Science, with the help of different sponsors.

Competition Problems:

MAIN THEMES FOR THE TEST FOR THE NATIONAL INFORMATION TECHNOLOGIES (IT) OLYMPIAD

1. Computer systems. Main computer components. Basic computer operations. Basic input-output interfaces and standards.
2. Computer programs (software) – definition, main functions, classifications, development and implementation.
3. Main rules for working with computer systems and programs –start, stop, diagnose, problem detection, testing and maintenance.
4. Data communications – methods, mediums and channels, main functions. Information measuring. Binary computations. Computations in different numbering systems.
5. Operating systems – concepts, main tasks and functions, classification. Graphical User Interface (GUI) – concepts, main functions and operations. Files and File systems. Logical and physical organization..
6. Project management. Main project stages. Modeling methods. Evaluation of project results.
7. Data compression. Linear codes. Algorithms of Shenon-Fano and Hafman. Arithmetic coding. Dictionary coding: LZ-77 and LZW. JPEG coding. Archive utilities –WinZIP and WinRAR. How to create installation archives.
8. Computer text processing. Main text file formats (txt, doc, rtf), converting. Multi lingual texts. Coding text information. Text formatting. Basic text concepts and operations.
9. Computer graphics. Main graphics file formats (jpg, gif, tiff, eps, psd, ai, cdr). Image compressing. Vector and raster images. Converting. Main applications. Graphics editors. Working with colors.
10. Databases and Database system management. Logical and physical data organization. Data models. Relations. Data objects. Data types.
11. Information systems. Classification (ERP, CRM, Data mining, etc.) Main stages in the information systems development. Main tasks and functions. Information systems architectures – two tires (client/server), three-tiers, N-tiers (distributed).

12. Information security and protection. Coding methods and algorithms. Symmetrical algorithms – DES, 3DES. Asymmetrical algorithms (with private and public key) – RSA, DSA. Hash algorithms – SHA-1, MD5. Electronic signatures. Digital certificates.
13. Making presentations. Main components of a presentation. Design of multimedia presentations. Presentation software systems.
14. Multimedia applications. Multimedia software development systems. Animations and movies. Compression and converting between different multimedia file formats.
15. Computer networks. OSI model. Network protocols. Local area networks and Wide area networks. Main concepts, standards, topologies, communication devices and channels.
16. Internet – addresses, names, services, organization. TCP/IP protocol suite.
17. Electronic communication. Email clients, servers and protocols. Real-time communication – IRC, ICQ, Skype. Main functions and protocols.
18. World Wide Web – concepts and functions. Browsers, http protocol. Web pages and web servers – URI, methods.
19. Design and development of Web applications. Basic HTML tags. Advanced HTML tags, Cascading style sheets.
20. Internet scripting languages. Basic JavaScript concepts, functions and methods of use. Best practices.

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Photo Gallery:

Experts in IT are giving interesting lectures to teachers during the Olympiad

Students install their projects before the defense

Student defending his project

Student defending his project

All students listen to the presentation of one of their volleagues

Student defending his project

Additional Information:

Example test questions

In computer graphics the object line is the main component of:
а) raster graphics;
б) fractal graphics;
в) vector graphics;
г) pixel graphics.

The table rows in the Relational data base are called:
а) records;
б) forms;

в) fields;
г) keys.

The physical components of a computer are called:
а) software;
б) hardware;
в) interface;
г) freeware.

Computer viruses can be transferred via:
а) printer;
б) scanner;
в) modem;
г) plotter.

The graphics file CAT.GIF contains image of a dog. How many colors can contain this image?
а) 2;
б) 65 536;
в) 256;
г) 8.

What device is working at the all seven layers according to the OSI model:
А) Bridge;
Б) Hub;
В) Web server;
Г) Router

What Internet protocol is used for sending email:
А) DNS;
Б) SNMP;
В) SMTP;
Г) POP3;