OLYMPIAD ASSIGNMENTS (invitational stage)
"International Relations" (students)

Section 1. Testing knowledge of basic terms characterizing international cooperation in the field of AML/CFT and the content of the basic international legal documents .

Question 1.

Which convention does this description correspond to:

This convention is directly devoted to the issues of counteraction against one of the most widespread transnational crimes. It was one of the first legal documents which established that in order to effectively counteract against the crime itself, it is necessary not only to suppress it, but also to identify cases of laundering of incomes from this criminal activity. The convention establishes the duty of states to criminalize the use of incomes from criminal activity, the counteraction against which is the main subject of regulation of this convention. As a measure of counteraction, the convention requires the use of confiscation of not only the objects of the main crime and the equipment for their manufacture, but also the criminal incomes from this activity and the respective assets.

1. Vienna Convention 1988
2. Strasbourg Convention 1990
3. Palermo Convention 2000
4. Merida Convention 2003
5. Warsaw Convention 2005

The correct answer is 1

Question 2 .

Which convention does this description correspond to:

This convention is devoted to international cooperation in counteraction against crimes in general. In addition to special terms and special regulations, it contains norms concerning the issues of identifying criminal incomes and assets acquired with them, and the issues of their confiscation. The convention requires that the activity of money laundering is also should be considered as a crime. The convention specifically establishes the duty of states to create a supervision regime for banks and financial institutions in order to identify the laundering of criminal incomes, as well as the duty to carry out international cooperation in the area of exchanging operational financial information. This convention also obliges states to criminalize corruption, the definition and the list of elements of which are contained in a special article of the convention.

1. Vienna Convention 1988
2. Strasbourg Convention 1990
3. Palermo Convention 2000
4. Merida Convention 2003
5. Warsaw Convention 2005

The correct answer is 3.

Section 2. Testing knowledge of the institutional organization of international cooperation in the field of AML/CFT and the competence of international organizations and government agencies in this area .

Question 3.

Please select the most complete list of organizations that make up the institutional AML/CFT/CFMD system

1. IMF, Basel Committee on Banking Supervision, Europol, EAG, Wolfsberg Group
2. UN, INTERPOL, NAFTA, Minsk Group
3. European Drug Enforcement Committee, World Bank, CSTO, ECOSOC
4. IMF, INTERPOL, Minsk Group, OECD
5. Europol, INTERPOL, UN ECOSOC, Wolfsberg Group, MONEYVAL

The correct answer is 1

Question 4.

Which organization does this description correspond to:

The regional body, established in 1997 as a subcommittee of the Committee on Crime Problems, regularly reports to the FATF on its work. Its main task is to assess compliance with the main international standards for counteraction against money laundering and terrorist financing and the effectiveness of their implementation, and to make recommendations to national authorities on necessary improvements to their systems. In addition, it monitors member countries and candidate countries for joining the regional organization, which in turn are not members of the FATF.

1. MONEYVAL
2. World Bank
3. FATF
4. Wolfsberg Group
5. The Egmont Group

The correct answer is 1

Section 3. Testing knowledge of the content of the FATF recommendations with an emphasis on the criteria for achieving immediate results in the field of international cooperation .

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Question 5 .

During the mutual assessment of the AML/CFT/CFMD system of country X, the experts came to the following conclusions. Over the past year, more than 10 million suspicious transactions were blocked by the state's credit and financial institutions in compliance with the law. About a third of them were intended for domestic and foreign NPOs, regarding which the information was received as part of an international exchange on their involvement in terrorist financing or regarding which such suspicions were revealed during an inspection of their activities. Information about these NPOs was immediately sent out, and other information was also received that made it possible to conduct investigations, identify channels and sources of terrorist financing, suppress them and confiscate funds. The experts found that country X achieved effectiveness in one of the following Immediate Outcomes:

1. Immediate Outcome 1
2. Immediate Outcome 4
3. Immediate Outcome 6
4. Immediate Outcome 10
5. Immediate Outcome 2

The correct answer is 4

Question 6 .

State X, within the framework of international information exchange, provides accurate and timely information on the location of persons accused of laundering criminal incomes, extradites them upon request, provides a wide range of information, which makes the country unattractive to criminals, including terrorists, since they cannot feel safe in state X and cannot freely use their assets. Experts tend to assess the achievement of Immediate Outcome 2 by state X as corresponding to a high level of effectiveness. Which of the following data confirms the experts' conclusion?

A) the state provides information only within the framework of extradition requests
B) the state only fulfills requests, but does not make them itself
C) the state provides information on the assets and beneficial ownership of persons specified in the requests
D) the state enters into agreements on information exchange at various levels and seeks to expand the number of countries involved in this mechanism
E) only the Financial Intelligence Unit of this state deals with the execution of requests

1. A, B, E
2. B, D
3. C, D
4. A, D, E
5. C, D, E

The correct answer is 3 (C, D)

Section 4. Testing knowledge of schemes of offenses with international elements in the field of AML/CFT.

Question 7.

Based on the received Suspicious Operation Report, the Financial Intelligence Unit of Country K. established the existence of three legal entities: the owners of two international websites and one local company C., which had four shareholders: two citizens of Country K. and two citizens of Country D., who created Company C., which offers a set of online educational materials for investing in cryptocurrency called Best Coin . Analysis of data from the police, tax service and the Bureau of Registration of Legal Entities databases did not allow to obtain the information about any crimes committed by the above-mentioned persons, including money laundering or other crimes related to it. The information from open sources allowed the Financial Intelligence Unit of Country K. to establish a connection between a certain company Best Life Ltd. and the Best Coin cryptocurrency . As a result of the financial investigation, the Financial Intelligence Unit of Country K. uncovered a multi-billion dollar fraud with the Best Coin cryptocurrency, covering several countries.

Which of the following statements (additional information) characterize the suspicious nature of the activities of the companies mentioned in the text and reveal the course of the respective financial investigation?

(A) Having studied the information from the open sources, the Financial Intelligence Unit of country K. discovered that one of the citizens of country D. has a debt to the tax authorities and other authorities of country D., the Financial Intelligence Unit of country D. confirmed this information.
(B) A preliminary analysis of the financial activity showed that at that time the Best Coin cryptocurrency was not considered a financial pyramid, although some authorities in various countries issued warnings to citizens.
(C) Best Life Ltd. is registered in Country B and is deemed unauthorized to engage in commercial activity there, and one of the owners of Best Life Ltd., judging by the photos on his social networks, was ат odd-jobber, probably a painter or construction worker.
(D) One of the owners of Company C., having an amount of approximately 900,000 US dollars on his account, did not carry out financial transactions on this account for a long time.
(E) One of the owners of Company C. purchased precious metals from a jewellery store whose beneficial owner was listed on the invoice as Best Life Ltd., a company from Country B.

1) only (A)
2) only (B)
3) (B) and (D)
4) (A) and (C)
5) (C) and (E)

The correct answer is 5 (C, E).

Question 8.

Two companies, A and B, incorporated in Country P. in September 2016, represented by Mr. X, carried out a large number of transactions for Bitfinex . Two months later, they began actively transferring funds. For the receipt of funds, they used 70 bank accounts in small cooperative banks located near the capital of Country P.; at the same time, for debit transactions, they used a large international bank located in the same capital. At some point between June and November 2016, Mr. X created another foreign company, C, and acted as its representative. The activities of this company were similar to those of the first two companies. In total, approximately six Suspicious Operations Reports were filed against these companies between July 2016 and February 2017. In May 2017, the Financial Intelligence Unit of Country P received a request from the Financial Intelligence Unit of another country concerning several legal entities, including the key legal entity, Company A, involved in the main case investigated by the Financial Intelligence Unit of Country P. The request primarily concerned the activities of the fourth Company D, located outside of Country P, which carried out the type of activity carried out by Company A in the iFinex / Bitfinex / Tether group . In January 2018, the Financial Intelligence Unit of Country P froze four transfers intended for Company A, totaling USD 20 million, and froze the bank accounts of this company. There was information that the origin of these funds was varied: some of them were obtained from drug trafficking and illegal trade on the Darknet .

Which of the following statements can serve as a conclusion that summarizes all the information provided?

(A) Mr. X's activities involve using the most protected part of the banking sector to carry out illegal activities - cooperative banks operating outside the main financial centres.
(B) Mr. X created a shadow banking ecosystem to support various types of criminal activity and launder criminal incomes, within which financial transactions and complex methods of concentrating funds using a large number of bank accounts were carried out throughout the world.
(C) Mr. X created several companies to open accounts with several small cooperative banks; they carried out operations to deposit funds from a large international bank.
(D) Mr. X was charged with money laundering crimes related to drug trafficking and trafficking in illegal goods on the Darknet .

(E) Small financial institutions require special attention from the Financial Intelligence Unit: an analysis can be carried out on horizontal changes in the financial institution's balance sheet, which allows identifying sharp increases or changes in smaller categories of organizations, such as deposits.

The correct answer is B.

Question 9.

A Suspicious Operation Report was filed against a company operating in the metals and waste disposal sector without a proper organizational structure or declared economic activity. The prosecutor's office had been investigating the previous shareholders in 2015, and the new shareholders had acquired the company at a price well below market value and had limited knowledge and skills to operate in a highly regulated industry. The investigation uncovered company account statements showing bank transfers that were justified as advance payments of invoices by Country I. companies operating in the same sector that had previously been investigated for tax crimes, illegal metal waste disposal, and laundering of illegal mafia incomes. Some of these companies had been investigated by a Country I. city prosecutor for allegedly creating a criminal group involved in international waste smuggling to countries in East Asia. The forged shipping documents stated that the cargo consisted of goods and raw materials, not waste. An analysis conducted by the Financial Intelligence Unit of Country I. showed that the beneficial owners of these companies were part of a wide network of individuals who exchanged financial flows via prepaid cards and withdrew cash.
Which of the following statements is directly based on the information provided and most accurately reflects the main conclusion of this passage?
(A) Shell (one-day) firms are often used in ML to mimic legitimate services and payments related to the forestry sector, mining or waste markets.
(B) This passage describes an organised crime network operating through a shell company in the waste management sector.
(C) The criminal network used the cash-intensive export sector to launder incomes from illegal metal waste disposal and launder illegal mafia income.
(D) The criminal network set up a waste management company that had no significant legitimate business activity and used shell companies located overseas to move funds overseas and back under the guise of waste management invoices.
(E) The information provided in this passage underlines the importance of regulators' outreach to ' gatekeepers ' (eg lawyers and trust and company service providers) and the importance of identifying the specific beneficial owners behind linked companies.

The correct answer is D.

Question 10.

Tthe Financial Intelligence Unit of Country B received suspicious transaction reports alleging that a group of hairdressers in Country B were transferring funds inconsistent with their perceived financial means from locations outside their alleged area of activity. The funds were immediately transferred to individuals known to be illegal diamonds miners in the north-east of Country B. The hairdressers were importing hair using a trade-based money laundering scheme developed by illegal miners and a professional criminal group, with the criminals invoicing the hairdressers for the imports on their behalf. The discrepancy between the perceived income levels of the remitters and the transaction amounts prompted a closer investigation of the miners, which linked the group to a previous investigation and revealed that some of the miners were receiving funds from importers in Southeast Asia through a scheme controlled by a network of underground stock market dealers. Major mining companies in Country B were found to have purchased emeralds from illegal miners and exported them to Southeast Asia using fake invoices and other fraudulent export documentation. The miners and mining companies exported the diamonds directly to foreign mining companies and then received payment through a network of underground stock market dealers. The investigation into the case is ongoing, with the financial flows estimated at approximately US$120 million.

Which of the following statements is directly based on the factual circumstances of the case and most fully reflects the main conclusion of this passage?

(A) A common feature of all forms of environmental crimes is the use of trade fraud to conceal the movement of money across borders, including falsification of documentation, particularly in relation to the import and export of goods, and the falsification of invoices and trade transactions to justify cross-border movements of funds
(B) The tendency to over- or under-declare goods shipped and to use false descriptions are common features of both trade fraud and money laundering activities.
(C) The general tendency of environmental crimes to mix legal and illegal products may create problems in distinguishing between trade-based money laundering and trade fraud.
(D) In trade-based money laundering, the primary objective is to exploit the trading system to cleanse incomes: the complexity and high volume of transactions in this sector can allow criminals to use trading as a cover for moving money across borders.
(E) An organized crime group used a scheme based on trade and fake export documentation to launder incomes from illegal mining through local barber shops.

The correct answer is E.

OLYMPIAD ASSIGNMENTS (invitational stage)
"LAW" (students)

Section 1. ***I. Testing knowledge of basic terms characterizing activities in the field of AML/CFT.***

Question 1.

Money or assets laundering is ...

1. the activity aimed at giving a legitimate appearance to the ownership or disposal of funds or other assets which were received as a result of committing a crime
2. the activity of specific authorities aimed at washing money or assets from their dirty origins
3. the activity of the state aimed at control over the movement of money or assets on the territory of the state
4. the activity of the Central Bank of the State aimed at exchange of worn and damaged banknotes
5. the activity aimed at financing organizations created to commit crimes of an extremist nature

The correct answer is 1

Question 2.

Crowdfunding is

1. a legitimate way of raising funds from a large number of participants by collecting donations (in the form of insignificant amounts), most often in online communities in support of an idea or project
2. organizing various types of events: music concerts, festivals, competitions in fight clubs, by selling tickets and souvenirs in support of any idea or project
3. membership fees collected by non-profit organizations (NPO) to carry out their activities
4. internet fraud method
5. water sport

The correct answer is 1.

Section 2. Testing knowledge of the powers of financial intelligence units, AML/CFT and Proliferation of WMD financing compliance units.

Question 3.

What suspicious transactions with cash do financial intelligence units pay attention in bribery or other corruption-related crimes:

1. paying off credit card debts with cash
2. purchasing goods with cash
3. depositing cash to the personal accounts with subsequent transfer to other accounts
4. purchase of currency for cash
5. cash withdrawal from a bank card

The correct answer is 1

Question 4.

Define, what type of financial fraud is presented by stealing bank card data by using ат ATM skimmer?

1) skimming
2) phishing
3) vishing
4) click fraud
5) smishing

The correct answer is 1

Section 3. Testing knowledge on application of a risk-based approach in the AML/CFT field.

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Question 5.

Identify what most significant predicate crimes presenting a source of illegal income are highlighted by the national risk assessments (NRA):

1. drug trafficking
2. theft of private property on a large or especially large scale
3. crimes related to violation of public order
4. crimes against justice
5. crimes of a corrupt nature

The correct answer is 1

Section 4. Testing knowledge on measures aimed at prevention, detection and suppression of money laundering and terrorist financing, neutralizing threats to national security arising from transactions (deals) with money or other assets.

Question 6.

Crypto-transactions can be used to launder criminal income through complex cashing schemes and disguising the sources of funds in the cryptocurrency market. Criminals can use decentralized currency exchange offices or platforms with low user identification requirements to transfer funds without tracking their origin. It creates serious problems for law enforcement agencies when investigating financial crimes and laundering criminal incomes through cryptocurrency. What methods can help to prevent the use of crypto-transactions for laundering criminal incomes?

1. tightening the rules for identifying users on currency exchange platforms
2. creating of the reporting standards for all market participants
3. ignoring minor transactions as insignificant risks
4. conducting of regular audits of currency exchange platforms for compliance with legislation
5. legalization of all forms of cryptocurrency use without control

The correct answer is 1, 2, 4

Question 7.

Identify the measures to neutralize the threat of using nominal legal entities-residents of “one-day firms” in schemes for laundering of criminal incomes:

1. implementation of mechanisms to prevent the registration of such companies and the use of figureheads for this purpose
2. publication of methodic guidelines on increasing the attention to such companies
3. publishing of press releases notifying such companies of the risks
4. creation of a mechanism for treasury support of such companies
5. establishment of administrative liability for such an activity

The correct answer is 1.

Question 8.

What type of illegal activity is carried out by using the following “ pump & dump ” tools: coordinating the actions of Telegram channel subscribers at organized trades, biased presentation of information to subscribers as analytics regarding a certain issuer or a forecast of the future value of a company’s securities, selling an investment idea only to channel subscribers with subsequent publication of it in the open part of the resource in order to increase the earnings of paid subscribers due to price movement?

1. building of a financial pyramid
2. abuses in the process of issuing of securities.
3. market manipulation.
4. restrictions on competition.
5. illegal banking activities.

The correct answer is 3.

Question 9.

One of the methods of counteraction against money laundering is the implementation of a Know Your Customer (KYC) system. This system requires from the financial institutions to conduct thorough due diligence on customers before opening accounts or providing services. This helps to prevent banking services from being used for money laundering and other illegal activities. However, implementing KYC can also cause certain difficulties for customers and banks. Identify the advantages of a KYC system?

1. increase of the level of trust in financial institutions
2. simplifying the account opening process for clients
3. reducing the risks of financial crimes
4. increase of the number of clients by simplifying procedures
5. improvement of customer service quality

The correct answer is 1, 3.

Question 10.

Fill in the gaps in the text using the appropriate words and phrases from those presented below.

The spread and use of digital payment technologies has fundamentally changed the attitude of society to the problem of ensuring (A). The concept of the banking industry's counteraction against various manifestations of (B), including (C) and (D), is largely based on the high quality of data on suspicious transactions, which the country's (D) regulator distributes among all participants in the information exchange. The speed and effectiveness of countering against criminals, as well as the quality of (E) in banks, depend on the completeness, reliability and timeliness of the provision of this information. Therefore, ensuring proper data reporting in the banking industry is one of the key priorities of the financial system regulator, including supervisory. This is extremely important so that the mechanisms for countering theft (G) ensure the protection of the rights and interests of citizens - consumers of financial services.

Write your answer as a sequence of numbers. Case and number are not taken into account when answering.

1) cyber fraud
2) cash settlements
3) anti-fraud system
4) usage of money mules
5) information security
6) credit fraud
7) funds
8) financial relations
9) financial system

The correct answer is 5164937 .

(The spread and use of digital payment technologies has fundamentally changed the attitude of society to the problem of ensuring information security . The concept of the banking industry's counteraction against various manifestations of cyber fraud, including credit fraud and usage of money mules, is largely based on the high quality of data on suspicious transactions, which the country's financial system regulator distributes among all participants in the information exchange. The speed and effectiveness of countering against criminals, as well as the quality of anti-fraud systems in banks, depend on the completeness, reliability and timeliness of the provision of this information. Therefore, ensuring proper data reporting in the banking industry is one of the key priorities of the financial system regulator, including supervisory. This is extremely important so that the mechanisms for countering theft of funds ensure the protection of the rights and interests of citizens - consumers of financial services.)

OLYMPIAD ASSIGNMENTS (Invitation stage)
"Economics and Finance" (students)

Section 1. Testing knowledge of AML/CFT basic terms.

Question 1.

Match the types of financial crimes with their definitions:

Types of financial crimes	Definition of types of financial crimes
(1) money laundering (2) corruption (3) cybercrime (4) insider trading	(a) abusing official position for private gain (b) trading in various securities by individuals who have access to confidential information about an issuer (c) transferring money from the shadow economy to the official economy to get the opportunity to legally use funds (d) obtaining unauthorized access to personal information by using computer technology

Write the answer as a sequence of letters.

The correct answer is cadb

Answer: 1) – c, 2) – a, 3) – d, 4) – b

Question 2.

"Proceeds of Crime" in AML/CFT means…

1) any economic benefit derived from or obtained, directly or indirectly, through the crime commission;
2) property derived from or obtained, directly or indirectly, through the crime commission;
3) profits derived from or obtained, directly or indirectly, through the crime commission;
4) monetary funds and other assets obtained through corruption;

The correct answer is 1.

Question 3.

Match each term with its definition (*write the answer as a sequence of numbers*)

Term		Definition	
A	Game currency	1	A decentralized network that is not controlled by a single entity and is accessible by anyone anywhere in the world.
B	Cryptocurrency	2	A mechanism that helps to reach consensus among all network participants on blockchain state and its operation rules
C	Public blockchain	3	An unregulated digital currency controlled by developers or a founding organization consisting of various stakeholders involved in the process
D	Consensus	4	An agreement protocol that requires a transaction's hash to meet specific demands so that this transaction can be accepted into the blockchain.
E	Proof of Work	5	A type of digital currency that uses cryptography to secure transactions, control the creation of new units, and verify the transfer of digital assets.

The correct answer is 35124 .

Section 2. Testing knowledge of modern money laundering models.

Question 4.

The second stage in the four-phase money-laundering model developed and used by UN experts is to…

1) integrate "dirty" money into the financial sector of the economy or trade
2) separate funds from their source of formation
3) transfer funds into the legal possession of the beneficiary
4) disguise a trail of crimes committed by opening accounts with banks located far away from the crime scene and the criminals' place of residence
5) eliminate cash funds and deposit them into bank accounts of front men who have their own accounts with banks

The correct answer is 2.

Question 5.

The three-phase money-laundering model traditionally includes the following stages (choose the correct sequence of stages):

1) placement, layering, integration
2) implementation, layering, integration
3) integration, division, cashing out
4) layering, placement, integration
5) integration, layering, cashing out

The correct answer is 1.

Section 3. Testing practical skills in qualifying AML/CFT situations

Question 6.

In accordance with International Standard on Auditing 240, "The Auditor's Responsibilities Relating to Fraud in an Audit of Financial Statements", the key distinguishing factor between fraud and error in the financial statements of individuals responsible for corporate governance is:

1) intentional or unintentional actions that ultimately led to a material misstatement in the financial statements
2) extent of the error committed and of a corresponding material misstatement in the financial statements
3) exceedance of the error range committed over the established materiality threshold in audit
4) quantitative impact assessment on the level of corporate security
5) violation of both tax and criminal legislation

The correct answer is 1

Question 7.

Calculate the funding ratio as a result of the ***ABS*** enterprise activities if the equity capital is 3,890,000 rubles, the loan capital is 2,775,000 rubles, the net profit is 5,100,000 rubles. The answer is rounded to two decimal places (to hundredths) according to the arithmetic rules.

1) 1.40
2) 1.30
3) 1.20
4) 1.10
5) 1.00

The correct answer is 1.

Solution:

Funding ratio = Equity capital/Loan capital = 3,890,000 rubles/ 2,775,000 rubles = 1.40

Question 8.

Match the financial security risks of public authorities with the appropriate characteristics:

Risks	Characteristics
(1) resource and technical (2) social (3) regulatory (4) administrative and political	(a) obsolete material, technical and technology support database, production and technical capacity reduction, low research staff qualification, challenges in resource provision (b) deterioration of the political situation, change in leadership and principles of economic policy (c) legal protection decrease, amendments to the regulatory framework (d) decline in work motivation, growth of social tension

Write the answer as a sequence of letters.

The correct answer is adcb
Answer: 1 – a); 2 – d); 3 – c); 4 – b)

Question 9.

In the AML/CFT risk management model, identify the activities related to identification, recording and data systematization:
1) marking monitoring objects in registers according to selected areas and role groups
2) creating reporting forms for data representation
3) obtaining initial data from external sources and internal resources
4) priority setting and adjustment
5) detection of risk zones

The correct answer is 1.2

Question 10.

Choose the correct statements from the options given below:
(1) Custodian wallets are cryptocurrency wallets that are only accessible to the wallet owners.
(2) Cold wallets exist in the form of a mobile or desktop application.
(3) Custodian wallets are more vulnerable to hacking than non-custodial wallets.
(4) Cold wallets can only exist as a device.

1. 1 and 3
2. Only 2
3. 1, 2, 3
4. Only 3
5. 1, 2, 3, 4

The correct answer is 4 (only 3).

OLYMPIAD ASSIGNMENTS (Invitational stage)
Information Security (students)

Section 1: Testing knowledge of information security measures.

Question 1.

Correlate information security methods based on artificial intelligence with their brief characteristics (write an answer as a sequence of letters):

1	Threat intelligence	a	A proactive approach to countering threats. Rather than reacting to an incident that has already occurred, this approach suggests identifying potential threats. Real-time telemetry plays here an important role, providing all the necessary data for in-depth analysis of potential threats.
2	Threat hunting	b	A method that comprises active defense, cyber intelligence and search for information on possible threats. Business gets the opportunity to learn about a threat before it occurs and causes damage.
3	Employee behaviour analysis	c	A group of methods that can predict possible future threats. An artificial intelligence-based system is trained on historical and current data.
4	Anomaly detection	d	Studying the activity of an employee account. The system uses artificial intelligence to create a behavior pattern for this account.
5	Foresight analytics	e	An approach for identifying unusual behavior in a system or network. An artificial intelligence-based system is trained on data corresponding to normal user behavior to identify abnormalities that may indicate a breach of information security.

Correct answer - badec

Question 2.

Company N is planning to hold a confidential management board meeting to announce the company's report for 2024. When preparing the room for the meeting, the head of the security service assesses the extent to which this or that room is exposed to threats of audio information (speeches, discussions) being leaked through technical leakage channels. Select all objects in the room that can be used by intruders as channels of information leakage.

1. Portable battery-powered video projector;
2. Water cooler;
3. Window panes;
4. Plastic frames;
5. Electrical outlets;
6. Central heating batteries;
7. Metal parts of furniture;
8. Battery-operated wall clocks;
9. Telephone set.

The assignment checks knowledge of information leakage technical channels.

Correct answer - 3, 5, 6, 9.

Question 3.

Anton and Victor work in the same department in an organization where access to information resources depends on the mandate model. One day Anton asked Victor to replace him and make records to database for him. However, when Victor tried to do it, he realized that he did not have access to the database. A week later, Victor asked Anton to manage a table that Victor usually worked with. Would Anton be able to enter the data for Victor?

1. No, each employee has access only to their own objects;
2. No, they have different levels of access;
3. Yes, they work in the same department;

4. Yes, Anton has access to the table that Victor worked with.
5. We cannot be sure - depends on their roles in the information system;
6. We cannot be sure - it depends on the table secrecy level.

Correct answer - 4.

Section 2: Testing knowledge of cryptography and encryption.

Question 4.

The hash function F(x) = x^7 mod 1024 is given. Given F(z) = 384, find the maximum possible z from the range [0;1024). Specify a natural number as the answer.

Correct answer - 1014.

Question 5.

Nikolai decided to create a file to store his encrypted password for a banking app. The password consists only of numbers from 0 to 9. Nikolai used the following encryption several times:

1) He found the maximum number available;
2) He added the found maximum to all numbers.

When opening the encrypted file, the following numbers appeared: 56 49 52 56 54.

Find Nikolai's password.
Write down the numbers of the password consecutively without spaces.

Correct number - 70375.

Question 6.

While working on a term paper on information security, a student created his own implementation of a gamma cipher. The plain text is represented in binary ASCII encoding, and the gamma is generated in the following way. The user enters the first 8 bits himself - this is his secret key. Then, starting from the 9th bit the next gamma values are generated as follows: the last 3 bits are added modulo 2 (the operation 'exclusive OR' is implemented), and the result is inverted and declared as the first generated bit. Then a similar operation is repeated with the last 2 bits of the secret key and the first generated bit, which gives 10 bits. Then based on the last bit of the key and the last 2 generated bits, 11 bits are calculated, and so on until the number of bits is equal to the length of the plain text.
To defend the work, the student encrypted a two-digit hexadecimal number using this cipher, which after encryption looks like this:

0100000111101001

He later forgot the key entered, as well as the initial number. Among the test outputs of the programme he found 4 sequences that could potentially be a used gamma:

- 0100110110001101
- 0100011011101110
- 0100000101011001
- 0101010111010101

Determine which hexadecimal number the student has encrypted.

Correct answer – 77

Question 7.

Vasya is going to submit his photo to a photo contest. The organizers have specified the format and resolution required. Vasya is concerned that his work might be edited, which would affect it and reduce his chances to win. To make sure that the photo is unchanged, he wants to use cryptographic security methods.

Choose the cryptographic algorithms that will be suitable:

1. Symmetric encryption algorithms

2. Electronic digital signature schemes
3. Asymmetric encryption algorithms
4. Secret sharing protocols
5. Keyless hashing functions
6. Key hashing functions

Correct answer– 2, 5, 6.

Section 3: Testing practical skills of SQL injection prevention.

Question 8.

Criminals decided to use SQL injection to attack an insurance company's information system.
Choose a method of defense against the threat:

A. Using dynamic SQL statements
B. Using hard-coded SQL statements
C. Disabling database integrity checking
D. Using parameterised SQL queries

Correct answer – D

Question 9.

What attributes can identify SQL injections with a high probability?

A. SQL query contains several join operations
B. SQL query contains constant conditions that always return TRUE or False
C. SQL query does not use special characters: single quotes ('), double quotes (''), backslashes (\).
D. SQL query contains comments

Correct answer– BD.

Question 10.

The Users table in the corporate information system stores information about accounts and passwords, as well as personal information of the company's employees:

Users table:

Id	Username	Password	Position
1	alexB	wU6_ba_*7	engineer
2	IASidorov	ka-4f-Pe_9	accountant
3	TOPetrova	lucky6_3P	manager

Employee table:

Id	LastName	FirstName	hire_date	dismissal_date	users_id
1	Bobrov	Alexey	2020-01-15	2024-05-10	2
2	Sidorov	Ivan	2023-08-01		1
3	Petrova	Tamara	2024-02-10	2024-12-10	3
4	Popov	Petr	2020-01-15		2

An attacker may attempt to perform an SQL injection to gain access to personal data of company employees. Determine which query can be used to do this:

A. SELECT position FROM users WHERE username = '';
B. SELECT * FROM users WHERE username = '' OR '1'='1' -- ' AND password = 'some_password';
C. SELECT * FROM users WHERE Position='accountant';
D. SELECT * FROM Employee JOIN Users ON Employee.users_id=Users.Id WHERE Users.Position='engineer';

Correct answer - B.