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MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION
Federal State Autonomous Educational Institution
Higher Education
"NORTH CAUCASUS FEDERAL UNIVERSITY"

APPROVED BY
Acting Director of the Institute
Advanced Engineering
A.A. Porokhnya

DISCIPLINE ASSESSMENT TOOLS FUND
"Artificial intelligence in the professional sphere"

Field of study	11.03.02 Infocommunication Technologies and Communication Systems
Profile	Intelligent Data Processing in Infocommunication Systems and Networks
Year of start of training	Oct. 2026
Form of study	Full-time
Implemented in a semester	5

Introduction

1. Purpose

The Fund of Assessment Tools for the discipline "Artificial Intelligence in the Professional Field" is designed to objectively assess the level of competence formation.

2. FOS is an appendix to the program of the discipline "Artificial Intelligence in the Professional Field".

3. The developer is R. A. Voronkin, Associate Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

4. An examination of the FOC was carried out.

Members of the expert group:

Chairman: N.Y. Bratchenko, Chairman of the CMT of the Institute of Advanced Engineering, Associate Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

Members of the Commission:

V.P. Mochalov, Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

S.V. Melnikov, Senior Researcher of the Interdisciplinary Training and Research Center for Agricultural Technologies, Associate Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

Representative of the employer's organization:

Mironov V.A., General Director of Orintex LLC.

Expert opinion: The FAT for the discipline allows you to assess the level of competence formation. Start approbation.

5. The validity period of the FAT is determined by the period of implementation of the educational program.

1. Description of the criteria for assessing competence at various stages of their formation, description of assessment scales

Competence(s), indicator(s)	Levels of competence formation(s),			
	The minimum level has not been reached (Unsatisfactory) 2 points	Minimum level (satisfactory) 3 points	Intermediate level (good) 4 points	High level (excellent) 5 points
UK-1				
Learning outcomes in the discipline (module): <i>Indicator:</i> ID-1 UK-1 identifies a problem situation, carries out its multifactorial analysis and diagnosis based on a systematic approach;	Cannot formulate requirements and offer reasonable design solutions. Does not know the concept of design patterns.	Formulates simple requirements, applies design patterns with errors, specifications are fragmentary.	Confidently uses design patterns, develops sound technical specifications, and selects appropriate implements.	It fully implements the process from analysis to design, offers high-quality and justified solutions, and applies ready-made architectural templates.
UK-1				
Learning outcomes in the discipline (module): <i>Indicator:</i> ID-2 UK-1 searches, selects and systematizes information to determine alternative options for strategic solutions in a problem situation;	Does not have a systematic approach, does not apply methods of analysis and design.	He knows the methods, but applies them partially, without taking into account the specifics of the tasks.	He confidently uses the methods of system analysis, designs systems taking into account the requirements.	Uses the theory of systems and business process management in the design of complex systems, justifies the decisions made.
Learning outcomes in the discipline (module): <i>Indicator:</i> ID-3 UK-1 determines and assesses the risks of possible solutions to a problem situation, chooses the best option for its solution.	Does not understand the principles of structural analysis and decomposition of the system.	Makes incomplete or formal requirements, makes mistakes in the definition of subsystems.	Adequately forms requirements and subsystems, demonstrates an understanding of the architectural structure.	Clearly defines the properties of the system, competently designs and decomposes the architecture, takes into account limitations.

Assessment of the level of competence in the discipline is carried out on the basis of the "Regulation on the current monitoring of progress and intermediate certification of students in educational programs of higher education - bachelor's programs, specialist programs, master's programs - in the Federal State Autonomous Educational Institution of Higher Education "North Caucasus Federal University" in the current edition.

ASSESSMENT TOOLS FOR CHECKING THE LEVEL OF COMPETENCE FORMATION

Job Number	Correct answer	Content of the question	Competence
		Full-time, Semester 5	
1	Artificial intelligence is a field that studies the creation of intelligent systems	What is Artificial Intelligence?	UK-1
2	A) 1956	In what year was the term "artificial intelligence" first officially proposed at the Dartmouth Conference?A) 1956B) 1965C) 1972D) 1980	UK-1
3	Alan Turing	Who proposed the test that serves as a criterion for the intelligence of a machine?	UK-1
4	B) Turing Test	What is the name of a test in which a machine must imitate human behavior in a dialogue?A) Pascal testB) Turing testC) Gudel testD) Leibniz test	UK-1
5	Symbolic AI and Neural Network Approach	What are the two main approaches in the history of AI?	UK-1
6	Expert Systems	What kind of AI dominated in the 1970s and 80s?	UK-1
7	Machine learning became dominant in the 2010s	When did machine learning become the mainstream paradigm of AI?	UK-1
8	A) Automatic problem solving using logic and algorithms	What was the main task of early artificial intelligence?A) Automatic problem solving using logic and algorithmsB) Working with big dataC) Pattern recognitionD) Processor development	UK-1
9	B) ELIZA	What early program modeled therapist behavior?A) Deep BlueB) ELIZAB) AlphaGoD) Watson	UK-1
10	B) 1997	In what year did the computer beat the World Chess Champion?A) 1990B) 1997C) 2005D) 2016	UK-1
11	Deep Blue	Name the first AI system to beat the World Chess Champion	UK-1
12	Natural Language Processing, Computer	Name three applied areas of AI that developed in the 2000s	UK-1

	Vision, Games	and 2010s	
13	Deep learning has made it possible to achieve breakthrough results in tasks with images and speech	Why has deep learning been a key milestone in the development of AI?	UK-1
14	C) AlphaGo	Which AI system defeated the Go champion?A) DeepMind ChessB) IBM WatsonB) ElmanNetD) AlphaGo	UK-1
15	A) Knowledge gathering and inference	What was the main function of expert systems?A) Knowledge collection and logical inferenceB) Image processingC) Work with textsD) Internet search	UK-1
16	2010s, thanks to the growth of computing power and data	When and why did the rapid growth of AI begin?	UK-1
17	Yes, AI has begun to be used in medicine, education, logistics, and industry	Is AI used in the professional field? Give examples	UK-1
18	C) Logic, heuristics, reasoning	What are the tools behind symbolic AI?A) NeuronsB) Mathematical statisticsC) Signal processingD) Logic, heuristics, reasoning	UK-1
19	D) A model capable of performing tasks that traditionally require human intelligence	What is an intelligent system?A) Control systemB) Program with user interfaceC) RobotD) Model capable of performing tasks that traditionally require human intelligence	UK-1
20	AI research began in the mid-20th century and developed in waves of activity and decline	Describe in 1-2 sentences a brief chronology of the development of AI	UK-1
21	A search method that doesn't use additional information about the target state	What does the term "uninformed search" mean?	UK-1
22	A) Breadth-first search	Which algorithm guarantees finding the shortest path with equal weights?A) Breadth searchB) Depth searchC) Greedy searchD) Back search	UK-1
23	B) Search in depth	Which algorithm goes down one path to the end before returning?A) Breadth searchB) Depth searchC) Pattern searchD) Heuristic search	UK-1

24	An algorithm that combines the benefits of depth-first search and depth limitation	What is iterative deepening search?	UK-1
25	B) List of open peaks and list of visited	What do graph search algorithms use to track the search status?A) Stack onlyB) List of open vertices and list of visited verticesC) Array of weightsD) Heuristic table	UK-1
26	Yes, especially for analyzing state graphs and decision trees	Is NetworkX applicable to implement statespace search?	UK-1
27	NetworkX is a Python library for creating, visualizing, and analyzing graphs	What is the NetworkX library?	UK-1
28	A graph is a data structure consisting of nodes and edges	What is a graph in the context of search?	UK-1
29	B) Queue	What data structure does the breadth-first search use?A) Stack B) Queue C) Set D) Hash Table	UK-1
30	A) Stack	What data structure does depth-first search use?A) Stack B) Queue C) Array D) Heap	UK-1
31	Lack of information about the target state	Why is an uninformed search considered "blind"?	UK-1
32	The top of the tree is the state, and the edges are the actions that lead to new states	How to interpret a decision tree in a search problem?	UK-1
33	B) nodes, edges	What are the two key elements that define the graph structure in NetworkX?A) path, costB) nodes, edgesC) start, goalD) X, Y	UK-1
34	G.add_node(), G.add_edge()	What functions does NetworkX use to build the graph?	UK-1
35	Loops can cause searches to loop without regard to the vertices visited	Why is it important to track visited vertices when searching in the graph?	UK-1
36	For path construction, graph traversal, visualization, and connectivity analysis	What tasks are solved with the help of NetworkX?	UK-1
37	A) deque()	What data structure can be used in Python to implement a queue?A) deque()B) list()C) set()D) map()	UK-1
38	An algorithm that consistently increases the search depth from 0 to a predetermined	Describe how iterative deepening search works	UK-1

	limit		
39	Breadth-first search requires more memory, but guarantees the shortest path	What is the advantage of a breadth search over a depth search?	UK-1
40	The algorithm reverts to a previous state if the current path is a dead end	How does return work in tree search?	UK-1
41	Informed search is a search that uses heuristics to assess the prospectivity of states	What is Informed Search?	UK-1
42	A heuristic is a function that estimates the cost of achieving a goal from the current state	What is a heuristic function in search problems?	UK-1
43	A greedy algorithm chooses a state with minimal heuristics, without considering the path to it	How does the first-best match greedy search work?	UK-1
44	A* takes into account both the cost of the path from the initial state and the heuristics to the goal	What distinguishes the A* algorithm from greedy search?	UK-1
45	$h(n)$ — эвристика, $g(n)$ — стоимость пути, $f(n) = g(n) + h(n)$	Specify the formula by which the A* algorithm works	UK-1
46	A) Lowest value of $f(n)$	Which state is chosen first when using A*? A) Smallest $f(n)$ B) Smallest $h(n)$ C) Largest $g(n)$ D) Random	UK-1
47	A valid heuristic is a heuristic that never overestimates the cost to the goal	What is a valid heuristic?	UK-1
48	A* finds the optimal path if a valid heuristic is used	Under what condition does A* guarantee that the optimal path will be found?	UK-1
49	Manhattan Distance	Give an example of a valid heuristic on a square grid	UK-1
50	No, a greedy algorithm may not find the optimal path	Does a greedy search always find the best way?	UK-1
51	B) $f(n) = g(n) + h(n)$	What does the evaluative function $f(n)$ mean in A*? A) $h(n)$ * $g(n)$ B) $g(n) + h(n)$ C) $h(n) - g(n)$ D) $h(n)^2$	UK-1

52	Heuristics help to focus the search on the most promising paths	What role does heuristics play in speeding up searches?	UK-1
53	Yes, if the heuristic is incorrectly specified, A* may not work efficiently	Can A* work worse with the wrong heuristic?	UK-1
54	C) Additional information about the purpose is used	What is the difference between informed and uninformed search?A) Uses less memoryB) Has linear complexityC) Works only in treesD) Uses additional information about the target	UK-1
55	A* is more efficient, but requires more memory than a greedy search	How do A* and greedy search compare by efficiency and resources?	UK-1
56	f(n) should not overestimate the real cost in order to maintain optimality	Why is it important that the heuristic is valid in A*?	UK-1
57	C) Can revalue the cost to the target	What does an invalid heuristic do?A) Speeds up the searchB) Ensures optimalityC) Guarantees the shortest pathD) Can overestimate the cost to the target	UK-1
58	Yes, for example, in navigation, robotics, route planning	Is the A* algorithm used in real-world applications? Give an example	UK-1
59	D) An algorithm that selects nodes based on preliminary estimates of their prospects	Which definition best describes informed search?A) An algorithm that iterates through all nodesB) An algorithm that does not use evaluationC) A data visualization methodD) An algorithm that selects nodes based on preliminary estimates of their prospectivity	UK-1
60	Heuristics can be a problem if they are invalid or poorly aligned with the task	What are the risks associated with choosing a heuristic function?	UK-1
61	Local search is an optimization strategy that uses the current solution and its neighbors	What is Local Search?	UK-1
62	A) Hill Climb	Which local search algorithm chooses the best neighbor state?A) Hill ClimbB) Breadth SearchC) A*D) Return Search	UK-1
63	A local maximum is a point that is better	What is the local maximum in optimization problems?	UK-1

	than neighbors, but not a global maximum		
64	Hill Climb Algorithm Can Get Stuck in Local Highs	What is the disadvantage of the hill climbing algorithm?	UK-1
65	Simulated annealing is a stochastic algorithm that avoids local highs	What is the essence of the simulated annealing method?	UK-1
66	D) Temperature	Which parameter controls the probability of taking the worst state in the annealing simulation algorithm?A) VelocityB) RadiusC) NoiseD) Temperature	UK-1
67	Local beam search is a method that triggers multiple ascents at the same time	What is Local Ray Search?	UK-1
68	C) Flexibility in multidimensional spaces and noise resistance	What is the advantage of local search methods?A) Global optimum guaranteeB) Instant resultsC) Flexibility and stabilityD) No parameters	UK-1
69	Logistics optimization, route planning, layout tasks	Name the areas where local search is effectively used	UK-1
70	A genetic algorithm is an evolutionary optimization method based on the principles of natural selection	What is a genetic algorithm?	UK-1
71	Population, crossover, mutation, selection	Name the key components of the genetic algorithm	UK-1
72	D) Random change of a part of a chromosome	What is a mutation in genetic algorithms?A) A combination of two solutionsB) Selection of the best individualsC) Error checkD) Random change in a part of a chromosome	UK-1
73	A chromosome is a representation of a potential solution to a problem	What is a chromosome in the context of genetic algorithms?	UK-1
74	Yes, if the parameters are selected correctly and the task allows for approximation	Can a genetic algorithm find an approximate solution to an NP-hard problem?	UK-1
75	D) Crossover	What is the process of exchanging decision parts between parent chromosomes called?A) SelectionB) SimplificationC) MutationD) Crossover	UK-1
76	Yes, all of these methods use local	Do hill climbing, simulated annealing, and the genetic	UK-1

	information and heuristics	algorithm have anything in common?	
77	The simulated annealing algorithm is able to exit local lows, unlike climbing a hill	Why is an annealing simulation algorithm better than climbing a hill?	UK-1
78	D) All of the above	What parameters are important to adjust when using a genetic algorithm?A) Population sizeB) Probability of mutationC) Number of generationsD) All of the above	UK-1
79	Genetic algorithms can combine local and global search strategies	What is the power of genetic algorithms for complex problems?	UK-1
80	The ability to apply local search techniques is an important element of AI in applied tasks	Why is local search knowledge important for an AI specialist?	UK-1
81	Competitive search is the search for the optimal strategy in games with two opponents	What is adversarial search?	UK-1
82	Minimax is an algorithm for choosing the optimal move in the face of counteraction	What does the Minimax algorithm do?	UK-1
83	A) Minimize possible losses and maximize minimum winnings	What is the purpose of the Minimax algorithm?A) Minimize losses and maximize gainsB) Find nearest neighborC) Maximize heuristicsD) Minimize errors	UK-1
84	The evaluation function is a heuristic function that evaluates the position in the game	What is the evaluation function in the Minimax algorithm?	UK-1
85	A) Tree depth and calculation time	What are the most common limitations when using the Minimax algorithm?A) Tree depth and timeB) Compilation errorsC) Architecture selectionD) Weight matrix size	UK-1
86	Alpha is the best score for the maximizing player; beta is for the minimizing player	What do alpha and beta parameters mean in alpha-beta clipping?	UK-1
87	D) Removal of subtrees that will not affect the final result	What does alpha-beta clipping do?A) Increases tree depthB) Replaces heuristicsC) Simplifies estimationD) Removes useless subtrees	UK-1
88	Reduces the number of calculations	What is the advantage of using alpha-beta clipping?	UK-1

	required		
89	Yes, if properly evaluated, it allows you to process deeper trees	Can alpha-beta clipping increase the effectiveness of Minimax? Explain	UK-1
90	D) All of the above	What is required for the Minimax algorithm to work?A) Clear rules of the gameB) A certain evaluation functionC) A tree of possible movesD) All of the above	UK-1
91	A situation in which a player acts against a reasonable opponent	What does adversarial play mean?	UK-1
92	It is used in games: chess, tic-tac-toe, go, etc.	Where is the Minimax algorithm used in practice?	UK-1
93	D) A move that minimizes the opponent's maximum gain	What move does the minimizing player choose in the Minimax algorithm?A) RandomB) With the highest heuristicC) First of the listD) With minimizing the maximum	UK-1
94	Depth of the tree, number of possible moves, complexity of the evaluation function	What factors affect the performance of the Minimax algorithm?	UK-1
95	Heuristics are necessary because it is impossible to calculate the tree completely in complex games	Why are heuristics necessary in the Minimax algorithm?	UK-1
96	B) The opponent tries to minimize the player's winnings	What principle is taken into account when developing the Minimax algorithm?A) Accuracy optimizationB) Opponent counteractionC) Random selectionD) Refusal to evaluate	UK-1
97	Yes, clipping reduces computation without losing the quality of the result	Does alpha-beta clipping affect the outcome of turn selection?	UK-1
98	No, under certain conditions, the result will remain the same, but it will be achieved faster	Does alpha-beta clipping change the choice of move compared to the regular Minimax?	UK-1
99	The top of the tree where the game ends or the depth limit is reached	What is the terminal vertex in the Minimax algorithm?	UK-1

100	D) Optimal strategy in the face of counteraction	What is the ultimate goal of the Minimax algorithm?A) Fast convergenceB) Depth maximizationC) Tree constructionD) Optimal strategy	UK-1
101	An intelligent agent is a system that perceives the environment and acts in it	What is an intelligent agent?	UK-1
102	A) A program agent that responds to changes in the environment	Which example refers to the simplest intelligent agent?A) Agent program that responds to changes in the environmentB) Algorithm with a graphical interfaceC) Random data generatorD) OS shell	UK-1
103	An agent who acts according to rigid rules	What is a reactive agent?	UK-1
104	Environment, sensors, actuators, goal, strategy	Name the main components of an intelligent agent	UK-1
105	Inference is the process of deriving new statements from known ones using the rules of logic	What is Inference?	UK-1
106	D) The truth of a formula in the logic of statements depends on the interpretation	What does the semantics of propositional logic mean?A) Sequence of operationsB) Data structureC) Rules of inferenceD) The truth of a formula depends on interpretation	UK-1
107	Propositional logic	What type of logic is used in the simplest agent-based models?	UK-1
108	A) Disjunction of negations	What logical expression forms a resolvent in the method of resolutions?A) Disjunction of negationsB) Conjunction of statementsC) Implication of hypothesesD) Simple disjunction	UK-1
109	Method used to prove logical statements by sequential elimination	What is the resolution algorithm?	UK-1
110	B) Simplification of logical expressions to an empty disjunction	What is the criterion for completing the resolution method?A) True formula foundB) Empty disjunction obtainedC) One implication obtainedD) Conclusion completed in time	UK-1

111	Yes, inference allows you to make informed decisions based on knowledge	Can inference be used to construct agent behavior?	UK-1
112	D) Environmental conditions and goals of the agent	What does the behavior of an intelligent agent depend on?A) Random dataB) Graphical interfaceC) Type of memoryD) Environmental conditions and goals	UK-1
113	Yes, the simplest agent can make decisions based on logical conditions	Can even the simplest intellectual agent use the logic of statements?	UK-1
114	D) Depending on the architecture and complexity of the environment	What does the structure of an intelligent agent depend on?A) Only the speed of the processorB) Only the programming languageC) Only memoryD) Architecture and environment	UK-1
115	Used for knowledge representation and inference	What is the advantage of propositional logic for intelligent systems?	UK-1
116	D) Axioms, rules of inference, theorems	What does a formal system of logic include?A) Equations and numbersB) Lists and setsC) Variables and functionsD) Axioms, rules, theorems	UK-1
117	Resolutions apply to disjunctions containing opposite literals	How is a new disjunction formed when applying a resolution?	UK-1
118	A simple agent can use logical rules like "if... then..."	How can logic be built into the simplest agent?	UK-1
119	Ability to describe the behavior of an agent through logical rules	What is tested when assessing competence by inference within the framework of the topic of intelligent agents?	UK-1
120	The use of logic helps an agent make decisions based on knowledge rather than random actions	Why is logic important for the intelligent behavior of an agent?	UK-1
121	Natural Language Processing (NLP) is a field of AI that studies the interaction between computers and human language	What is Natural Language Processing (NLP)?	UK-1
122	Text classification is the task of assigning text to one of the predefined categories	What is text classification in NLP?	UK-1
123	A) Extracting Significant Facts and Entities	What is text extraction?A) Extract significant facts and	UK-1

		entitiesB) Translate textC) Remove punctuationD) Word count	
124	Information search is the task of finding pieces of text that match a user's query	What is meant by the task of searching for information in the text?	UK-1
125	A) Transformer	What is the architecture behind today's large language models?A) TransformerB) LSTMC) SVMG) KNN	UK-1
126	A model trained on a large amount of text data, capable of generating, enriching and analyzing text	What is a large language model?	UK-1
127	Yes, BERT and GPT are transformative models	Are BERT and GPT Transformers?	UK-1
128	Hugging Face Transformers is a Python library for working with models based on the Transformers architecture	What is the <code>transformers</code> package?	UK-1
129	from transformers import pipeline	What code allows you to import basic functionality from the transformers library?	UK-1
130	D) Classification, answering questions, summarizing	What problems can be solved with <code>transformers</code> ?A) Graph searchB) RenderingC) Sorting numbersD) Classification, answering questions, summarizing	UK-1
131	Yes, you can use local models through Ollama or cloud models through YandexGPT, GigaChat	Can I use large language models on-premises and in the cloud?	UK-1
132	B) Text generation, answering questions, data format conversion	What are the functions of large language models?A) Parsing onlyB) Text generation, responses, format conversionC) Word count onlyD) Translation only	UK-1
133	Ollama allows you to run local LLM models with a command line interface or API	What does Ollama allow you to do?	UK-1
134	YandexGPT and GigaChat provide access to LLMs through cloud APIs and interfaces	What is special about YandexGPT and GigaChat as language models?	UK-1
135	Yes, models can be trained and customized	Is it possible to adapt language models to specific tasks?	UK-1

	for specific tasks (fine-tuning)		
136	D) The sequence of tokens is transformed through the mechanisms of attention	How does the Transformers architecture work?A) Using a stackB) Through feature filteringC) Using decision treesD) Through attention mechanisms	UK-1
137	Tokenization is the splitting of text into elements (tokens) that are processed by the model	What is tokenization in NLP?	UK-1
138	The answer to the question is an example of an information extraction problem	What class of tasks does the search for an answer to a question in the text belong to?	UK-1
139	Yes, language models are used to automate tasks in education, law, and analytics	Are language models used in the professional field? Give examples	UK-1
140	D) Completeness, accuracy, F1 measure	What metrics are used to evaluate the quality of models in NLP?A) Standard errorB) VarianceC) DeviationD) Completeness, accuracy, F1	UK-1
141	Reinforcement learning is a method of learning based on an agent's interaction with the environment and the receipt of a reward	What is reinforcement learning (RL)?	UK-1
142	A) Agent, environment, actions, reward, strategy	Name the main components of a reinforcement learning modelA) Agent, environment, actions, reward, strategyB) Data, model, algorithmC) Graph, vertices, weightsD) Question, answer, document	UK-1
143	The agent learns from experience and rewards, without having pre-labeled data	How is RL different from supervised learning?	UK-1
144	A) Passive	What is the name of the type of learning in which the agent does not select actions, but evaluates them?A) PassiveB) ActiveC) MixedD) Interactive	UK-1
145	B) Active	What is the name of the type of learning in which the agent chooses actions to achieve the goal?A) PassiveB) ActiveC) ReflectiveD) Generalizing	UK-1
146	Policy defines what actions to take in each	What is a policy in reinforcement learning?	UK-1

	state		
147	Reward is a numerical assessment of the result of an agent's action	What is remuneration in the context of RL?	UK-1
148	The Q-function evaluates the value of the state-action pair	What Does the Q Function Evaluate in Reinforcement Learning?	UK-1
149	D) Finding a policy that maximizes the expected total reward	What is the main task of reinforcement learning?A) Class predictionB) Graph learningC) Dimensionality reductionD) Finding the policy with the highest reward	UK-1
150	Yes, the agent can use approximate environment models	Can an agent generalize behavior without knowing the exact model of the environment?	UK-1
151	B) Generalization	What is the name of an agent's ability to apply knowledge to new, unexplored situations?A) ReinforcementB) GeneralizationC) ActivationD) Classification	UK-1
152	A) Markov decision-making process	What is the mathematical model behind RL?A) Markov processB) Bayesian networkC) KNNG) Neural network	UK-1
153	Updating the agent's strategy based on experience and new rewards	What does agent training mean in RL?	UK-1
154	Yes, the strategy can be greedy, stochastic, or deterministic	Can an agent use different types of strategies?	UK-1
155	D) Balance between environmental research and the use of knowledge	What does the "exploration vs. exploitation" problem mean?A) Model selectionB) Comparison of actionsC) Minimization of lossesD) Balance of research and application	UK-1
156	It is used to assess the quality of the strategy at different stages of training	Why do we need a value function in RL?	UK-1
157	D) Q-function strategy training algorithm	What is Q-Learning?A) Deep RegressionB) Tree ApproximationC) Breadth SearchD) Strategy Training Algorithm	UK-1
158	D) An algorithm that combines value estimation and strategy	What is SARSA?A) Trait selection methodB) ClusteringC) InferenceD) Algorithm for evaluation and strategy	UK-1
159	The agent accumulates experience and	What is the principle of reinforcement agent learning?	UK-1

	gradually improves behavior		
160	Yes, RL is actively used in robotics, control, gaming, and recommender systems	Is RL used in real-world applications? Name the areas	UK-1
161	Computer vision is a field of AI that deals with the automatic interpretation of images and videos	What is computer vision?	UK-1
162	Filtration, threshold processing, contour analysis	What are the basic operations in image processing?	UK-1
163	A) Recognizing Objects in an Image	What does the visual recognition task involve?A) Object recognitionB) Model creationC) Video encodingD) Compression	UK-1
164	D) Detection and classification of objects	What are the two stages of object recognition?A) Compression and encryptionB) Filtering and storageC) Analysis and transmissionD) Detection and classification	UK-1
165	Detection is the finding of an object, classification is the determination of its type	What is the difference between object detection and classification?	UK-1
166	3D restoration is the process of reconstructing a spatial scene from 2D images	What does 3D world restoration mean in computer vision?	UK-1
167	B) Stereovision	What method is used to derive scene depth from a pair of images?A) HistogramB) Stereo visionC) GradientD) Morphology	UK-1
168	D) Edge features, textures, geometry	What is used to recognize objects from structural information?A) Color filtersB) Cache mechanismsC) RegressionD) Boundary features and geometry	UK-1
169	Fourier transform, Gaussian filters, Sobel operators	What methods are used to identify features in an image?	UK-1
170	Yes, many models use convolution cascades to extract features	Are convolutional filters used in computer vision tasks?	UK-1
171	D) OpenCV	Which Python library is often used to work with images?A)	UK-1

		pandasB) matplotlibC) numpyD) OpenCV	
172	Color, shape, structure, location in the scene	What characteristics are considered when analyzing an image?	UK-1
173	Segmentation is the division of an image into areas corresponding to objects	What is segmentation in computer vision?	UK-1
174	Yes, 3D Restoration allows you to determine the position of objects in space	Can 3D recovery be used in navigation systems?	UK-1
175	A) Outline	Which image element is usually highlighted with the help of the Sobel operator?A) ContourB) BrightnessC) DepthD) Shape	UK-1
176	It is used to create environmental models and recognize objects in space	Why is 3D scene reconstruction used?	UK-1
177	D) Converting input images into a form that is easy to analyze	What is the purpose of image preprocessing?A) Creating a modelB) Improving memoryC) Reducing data sizeD) Preparing for analysis	UK-1
178	Yes, computer vision is used in medicine, industry, security, etc.	Is computer vision used in the professional field? Give examples	UK-1
179	D) Calculating the spatial characteristics of the scene	What does image depth analysis include?A) Color balanceB) Text classificationC) Label markupD) Spatial characteristics	UK-1
180	The ability to apply computer vision methods allows you to automate visual analysis tasks	Why is computer vision knowledge important for an AI professional?	UK-1

2. Description of the rating scale

Students' progress in each discipline is assessed during current control and intermediate certification.

3. Criteria for assessing competencies*

3.1. PC-1 Competency Assessment

The **UK-1 competence** is aimed at mastering the basics of designing intelligent systems, including task analysis, the formation of requirements and the selection of solutions based on modern artificial intelligence technologies. It is formed through case analysis, theoretical and practical classes, and the performance of tasks focused on the development of functional and technical requirements for AI systems.

The criteria for achieving UC-1 include:

- knowledge of the history and stages of development of artificial intelligence;
- ability to analyze the tasks of the subject area from the point of view of the applicability of AI solutions;
- the ability to describe the functionality of intelligent systems;
- Understanding of the architecture, construction principles, and components of AI systems;
- the skill of setting tasks based on the professional context.

Competency is assessed through tests, situational tasks, written explanations, discussion of conceptual solutions, and analysis of specific application scenarios for the use of AI.

The competency is also focused on the practical application of artificial intelligence methods in professional activities, including modeling, tuning, and implementing intelligent components in real processes. It is formed on the basis of practical classes, laboratory work, and the performance of tasks using specialized tools.

Achievement criteria include:

- knowledge and application of search methods in the space of states (including heuristics and adversarial strategies);
- implementation of intelligent agents, logical models and inference mechanisms;
- Ability to use Python libraries for text and image analysis (including `transformers`, `networkx`, `opencv`);
- Ability to work with large language models, including through APIs and local environments;
- knowledge of local and evolutionary search methods (imitation of annealing, genetic algorithms);
- application of reinforcement learning algorithms, including the construction and training of agents;
- the use of AI in professional tasks (recognition, visualization, restoration of structure, extraction of information, etc.).

Competence is tested through the implementation of practical cases, test tasks, implementation of models, protection of solutions and analysis of the effectiveness of intelligent systems.

3.2. Levels of competence formation

The assessment of the level of competence formation is carried out on a four-point scale:

- **2 (low level)** – not formed; knowledge is fragmentary, actions are unconscious;
- **3 (sufficient level)** – partially formed; there are gaps in understanding and application;

- **4 (good level)** – confident performance of tasks with minor remarks;
- **5 (high level)** – full understanding, accuracy and validity of decisions, independent thinking.

The assessment of competencies is recorded at different stages of mastering the discipline and serves as the basis for the current, intermediate and final control of students' knowledge.