Huawei ICT Competition 2024-2025 Exam Outline

Practice Competition - Cloud Track

CONNECTION GLORY FUTURE

I. C. The Future

1. Overview

Competition Stage	Exam Type	Duration	Number of Questions	Question Type	Total Score	Number of Contestants	Note
Preliminary Stage (Mandatory)	Written	90 minutes	60	True or false questions, single-answer questions, and multiple-answer questions	1000	Individual	From January 1, 2024 to the end date of the preliminary stage, 50 bonus points will be acquired for passing any of HCIA-Cloud/Big Data/AI certification, 100 bonus points for any of HCIP-Cloud/Big Data/AI certification, and 200 bonus points for any of HCIE-Cloud/Big Data/AI certification. These bonus points can be combined up to a maximum of 200 points. **Note**: The Uniportal account used for the competition registration must be the same as that for the certification. Otherwise, no bonus point can be given.
National Stage	Written	90 minutes	90	True or false questions, single-answer questions, and multiple-answer questions	1000	Individual	/
Regional Stage	Written	60 minutes	60	True or false questions, single-answer questions, and multiple-answer questions	1000	3 (as a team)	In the regional stage, all three contestants of a team will collaborate in completing the same set of test questions for the written exam and the shared tasks for the lab exam. One team can submit only one set of answers for each of their written and lab exams. Total score = 30% x Written exam score + 70% x Comprehensive lab exam score.
	Lab	4 hours	/	Comprehensive lab	1000		
Global Stage	Lab	8 hours	/	Comprehensive lab	1000		/

2. Weighting

Technical Direction	Competition Stage			
	Preliminary Stage	National Stage	Regional Stage	Global Stage
Cloud	40%	40%	40%	40%
Big data	20%	20%	15%	15%
AI	40%	40%	45%	45%

3. Scope

3.1. Overview of Exam Contents

The Cloud Track exam contents cover knowledge about cloud, AI, and big data, including but not limited to the knowledge of cloud computing, cloud native, Huawei Cloud products and services, Huawei Cloud solutions, basics of big data, basic principles and applications of big data components, big data mining, AI technologies and applications, machine learning, deep learning, computer vision, and Natural Language Processing (NLP).

3.2. Knowledge to Be Tested

Technical Direction	Category	Key Item	Description	Preliminary Stage HCIA	National Stage HCIP	Regional Stage HCIE	Global Stage HCIE or above
Cloud	Cloud computing concepts	IT developments	Concept of IT evolution: physical environment > virtual environment > private cloud/public cloud	√	√	√	√
		Cloud computing concepts	Development, definition, value, and classification of cloud computing	√	√	√	√
		Private cloud concepts	Private cloud concepts, mainstream vendors and products, and application scenarios	√	√	√	√
		Public cloud concepts	Public cloud concepts, mainstream vendors and products, and application scenarios	√	√	√	√
	Public cloud service operations	Huawei Cloud	Huawei Cloud overview, Huawei Cloud application scenarios, Huawei Cloud ecosystem, introduction to AZs, regions, Identity and Access Management (IAM), projects, and Huawei Cloud billing modes	√	√	√	√
		Compute services	Compute service overview, Elastic Cloud Server (ECS), Bare Metal Server (BMS), Image Management Service (IMS), and Auto Scaling (AS)	√	√	√	√
		Networking services	Similarities and differences between traditional networks and cloud networks, Virtual Private Cloud (VPC) technologies, security groups, Access Control List (ACL), Elastic IP (EIP), Elastic Load Balance (ELB), Virtual Private Network (VPN), and NAT Gateway	√	√	√	√
		Storage services	Data storage concepts and development, cloud storage concepts, classification, and application scenarios, and concepts, technical principles, and usage of Object Storage Service (OBS), Elastic Volume Service (EVS), Scalable File Service (SFS), and Dedicated Distributed Storage Service (DSS)	√	√	√	√
		Database services	Database overview and development, relational database concepts, cloud database introduction, and introduction, features, and usage of Relational Database Service (RDS) and non-relational database service GeminiDB	√	√	√	√
		O&M	Cloud O&M overview and tools, and concepts, technical principles, and usage of Cloud Eye, Cloud Trace Service (CTS), Log Tank Service (LTS), and IAM	√	√	√	√
		DR and backup	Concepts, technical principles, and usage of Cloud Backup and Recovery (CBR) and Storage Disaster Recovery Service (SDRS)			√	√
		Security	Web Application Firewall (WAF), Host Security Service (HSS), Cloud Firewall (CFW), Data Encryption Workshop (DEW), and Cloud Bastion Host (CBH)			√	√
		Application O&M	Application Operations Management (AOM), Application Performance Management (APM), and CodeArts PerfTest			√	√
	Basic cloud native services	Cloud native concepts	Cloud native concepts, including the development, features, models, benefits, application scenarios, and trends		√	√	√
		Cloud native infrastructure – Containerization	Huawei Cloud container services, including concepts, technical principles, and usage of containers, container engines, container images, container repositories, Kubernetes and its architecture, Kubernetes orchestration, and Huawei Cloud Cloud Container Engine (CCE), Cloud Container Instance (CCI), and FunctionGraph		√	√	√
	Cloud architecture design	Service migration	Concepts, configuration requirements, and application scenarios of migration services, such as Server Migration Service (SMS), Data Replication Service (DRS), Database and Application Migration UGO, and Data Express Service (DES)			√	√
		Cloud architecture design	Cloud migration planning, cloud service architecture design, and planning and precautions for availability, scalability, security, and cost during cloud migration			√	√
	Cloud native application building	Microservice concepts	Microservice concepts and mainstream architectures			√	√
		Cloud native application building	Concepts, technical principles, and usage of Application Service Mesh (ASM), ServiceStage, application middleware, and software development pipeline CodeArts			√	√
Big data	Big data storage and processing	Basic concepts	Basic concepts and characteristics of big data, development trends of the big data industry, and Huawei Kunpeng big data	√	√	√	√
		General big data components	Basic technical principles of general and important big data components, including HDFS, HBase, Hive, ClickHouse, MapReduce, YARN, Spark, Flink, Flume, Kafka, Elasticsearch, and ZooKeeper	√	√	√	√
		MapReduce Service (MRS)	Introduction to the Huawei big data platform MRS and its architecture design and core features, purchase and use, and application development	√	√	√	√
		Scenario-specific big data solutions	Scenario-specific big data offline processing, real-time big data retrieval, and real-time big data stream processing solutions			√	√
		Data lake solution	Data lake concepts and solution of data import into the lake			√	√
		Data governance	Data governance methodology			√	√
	Data mining	Data preprocessing	Data preprocessing, including missing values, abnormal values, duplicate values, unbalanced data processing, and skew data processing				√
		Feature engineering	Feature selection, including Filter, Wrapper, and Embedded				√
		Supervised learning	Supervised learning, including regression algorithms, classification algorithms, and integration algorithms				√
		Unsupervised learning	Unsupervised learning, including clustering algorithms, association algorithms, and dimensionality reduction algorithms				√
		Model evaluation and optimization	Model evaluation and optimization, including model selection and algorithm evaluation metrics				√
		PySpark MLlib data mining	PySpark MLlib classification and regression, clustering and dimensionality reduction, association rules and recommendation algorithms, and evaluation matrix				√
AI	AI basics	Basic AI concepts	AI-related concepts, development, and applications	√	√	√	√
		AI technology fields	AI research fields, including computer vision, NLP, and automatic speech recognition (ASR)	√	√	√	√
		Cutting-edge AI technologies and scenarios	Trends and scenarios of cutting-edge AI technologies, including autonomous driving, quantum machine learning, reinforcement learning, and knowledge graph	√	√	√	√
		Basics of large models	Application data, service processes, prompt projects, and development trends of large models	√	√	√	√
	AI algorithms	Machine learning	Traditional machine learning algorithms, ensemble learning techniques (boosting and bagging), hyperparameter search algorithms, model evaluation, and model validity (overfitting and underfitting)	√	√	√	√
		Deep learning	Deep learning algorithms (including fully-connected neural networks, CNN, RNN, LSTM, and GAN), loss function, gradient descent, neural network calculation process, optimizer and activation function, and regularization Common problems and handling, including gradient disappearance and data sample imbalance	√	√	√	√
		Large model algorithm architecture	Transformer, large language model (LLM), multimodal LLM, and MoE		√	√	√
	Huawei AI development platform	Huawei AI full-stack, all-scenario application	Huawei Cloud ModelArts, Ascend processors, and Atlas AI solutions	√	√	√	√
		Huawei Cloud AI development platform	Huawei Cloud AI development platform, including data labeling, ExeML, cloud-based development environment, algorithm management, training management, and application deployment	√	√	√	√
		Ascend large model solution	Ascend AI full-process enablement large model, Ascend AI basic software and hardware, large model development suite, acceleration library, and full-process toolchain MindStudio			√	√
		Huawei intelligent computing center solution	Basic concepts, computing power solution, network solution, and storage solution of the intelligent computing center			√	√
	AI development framework and parallel training framework	Introduction to the AI development framework	The MindSpore architecture and the all-scenario application of the MindSpore framework	√	√	√	√
		Basics and usage of MindSpore	MindSpore operating environment configuration and basics (tensor construction, data types and type conversion, and use of common functions and classes), data operations (dataset construction, data transformation, data enhancement, etc.), network construction, model training, saving, and loading	√	√	√	√
		MindSpore features	Use of dynamic graphs and static graphs, and implementation of inference and deployment on devices and cloud		√	√	√
		MindSpore development process and components	MindSpore AI application development process MindSpore components: MindSpore Serving, MindSpore Lite, and MindInsight			√	√
		PyTorch development framework	Architecture, basics and usage, and features of PyTorch, and Ascend-based native PyTorch			√	√
		Parallel training frameworks	Design, features, and applications of parallel training frameworks MindFormers and DeepSpeed			√	√
	AI application development	Computer vision	Digital image processing Computer vision tasks: image classification, image segmentation, and target detection Common computer vision algorithms: ResNet, YOLO, and VGG Computer vision application development based on MindSpore			√	√
		Speech processing	Speech signal preprocessing, speech processing tasks (such as speech recognition and text to speech), and speech processing application development based on MindSpore			√	√
		NLP	Text data processing, word embedding, NLP tasks (emotion classification, machine translation, and named entity recognition), general NLP algorithms (Transformer, Bert, and ELMO), and NLP application development based on MindSpore			√	√
		Large model training and inference process	Large model pre-training, fine-tuning, compression, deployment, and application		√	√	√

Note

This Exam Outline is for reference only. It does not cover all exam details.