"APPROVED"
Dean of the Faculty
of Computer Engineering
_____ T. Kuchkorov
"___" _____ 2026

Ministry of Digital Technologies of the Republic of Uzbekistan
Tashkent University of Information Technologies named after Muhammad al-Khwarizmi

QUESTIONS ON THE SUBJECT " IOT: SYSTEMS AND APPLICATIONS(T)" FOR CONDUCTING THE IR

1. MQTT protocol in IoT communication and its main role in data transmission
2. Systemic problems in ensuring cybersecurity in IoT devices and their technical solutions
3. Mechanisms of operation of MQTT and CoAP protocols and their differences
4. Prediction of possible failures in IoT systems using artificial intelligence
5. The importance of IoT standards in ensuring compatibility between devices from different manufacturers
6. Modernization of the healthcare system through remote medical monitoring and smart medical devices
7. The role of organizations such as the Open Connectivity Foundation (OCF) in unifying IoT protocols
8. Analysis of data privacy and ethical issues in the use of IoT devices in the medical sector
9. The role of IoT technologies in the concept of smart cities and applications for urban infrastructure
10. The impact of Industrial IoT (IIoT) systems on production efficiency and logistics
11. Economic advantages and technical barriers to the implementation of IoT systems in urban management
12. Mechanisms for real-time tracking of goods in supply chain management
13. Methods for optimizing energy consumption and saving resources in smart homes
14. Functional functions of sensors in IoT systems and main types of sensors
15. Scope and importance of Wi-Fi wireless communication technology in IoT networks
16. Methods for organizing and storing large volumes of data flows from IoT devices
17. The role of Bluetooth and BLE technologies in short-range IoT communication
18. Three-layer architecture of the IoT system and the scheme of connecting devices

to the cloud

19. Features of Zigbee technology in creating low-power mesh networks
20. Capabilities of cloud platforms in analyzing and processing IoT data
21. Common security threats to IoT devices and strategies for protecting against them
22. Comparison of MQTT, CoAP and HTTP protocols in terms of throughput and energy efficiency
23. The life cycle of IoT application development from idea to finished product
24. Integration of artificial intelligence and IoT and intelligent analysis algorithms
25. The impact of IoT technologies on the environment and the problem of electronic waste
26. Methods for increasing the level of interoperability in the IoT ecosystem
27. Technologies for predicting crop yields using sensors in precision agriculture
28. Fundamental principles of the Internet of Things and international standardization processes
29. Technical definition of the Internet of Things and its differences from the traditional Internet
30. Description of the relationship between hardware and software components of the IoT system
31. Physical characteristics and areas of application of sensors used in IoT devices
32. M2M (Machine-to-Machine) communication and protocols for exchanging information between devices
33. Encryption methods and techniques for protecting against unauthorized access in IoT networks
34. The concept of Edge Computing and the advantages of local data processing
35. The role of machine learning algorithms in intelligent management of IoT systems
36. Ethical impact of IoT technologies on society and issues of personal privacy
37. Modern trends in the field of IoT and the future role of 5G/6G communication
38. A real-life IoT project example of the system explaining the socio-economic effectiveness
39. Automated applications that provide security and comfort in smart home systems
40. Practical examples of the use of IoT technologies in the domestic and industrial sectors
41. Main strategic directions of IoT development and market requirements
42. Integration of Computer Vision technology with IoT devices
43. Technological and economic factors affecting the growth of the Internet of Things market
44. Analysis of end devices and their computing power in IoT architecture
45. Types of industrial actuators and their importance in remote control

46. Functional differences of the Arduino and Raspberry Pi platforms in creating IoT prototypes
47. The specific role of microprocessors, microcontrollers and microcomputers in IoT systems
48. Technical characteristics of the Arduino platform and the capabilities of the programming environment
49. Ensuring traffic safety using IoT in intelligent transport systems
50. The importance of the IPv6 protocol in global identification of IoT devices
51. Comparative description of wired (Ethernet) and wireless communication channels in IoT systems
52. IoT solutions for lighting and waste management systems in a smart city environment
53. Fundamental principles of connecting devices to local and global networks
54. Analysis of star, ring and mesh topologies for IoT networks
55. Wi-Fi and Zigbee Comparison of technologies in terms of power consumption and range
56. Technical features and advantages of Bluetooth Low Energy (BLE) technology
57. LPWAN technologies (LoRa, Sigfox) and long-range low-power communication capabilities
58. Preliminary filtering and normalization of data collected from IoT sensors
59. Principles of data organization and structural storage in IoT systems
60. Features of the concept of Big Data in relation to IoT data flows
61. Software tools and platforms used to analyze IoT data
62. Methods for processing real-time data flows (Streaming Data)
63. Technologies that ensure long-term data storage in IoT systems
64. Application of predictive models in data analysis
65. Cloud computing and its role in IoT infrastructure
66. Cloud service models (IaaS, PaaS, SaaS) and their application to IoT
67. Centralized advantages of cloud data processing in IoT systems
68. Comparative analysis of AWS IoT, Google Cloud IoT and Azure platforms
69. Stages of turning an IoT prototype into a commercial product
70. Data integrity in the IoT ecosystem and protect them from unauthorized modification
71. Future trends related to the increase in computing power of IoT devices
72. The history of the origin of the Internet of Things concept and Kevin Ashton's ideas
73. Classification of IoT technologies by application areas (Consumer, Industrial, Infrastructure)

74. Economic constraints and investment risks in the large-scale implementation of IoT systems
75. The impact of semiconductor technology developments on the size of IoT devices
76. The role and function of "Gateway" devices in IoT architecture
77. Selection criteria for various microcontrollers (ESP32, STM32, AVR) for IoT projects
78. Mechanisms for receiving analog and digital signals of Arduino sensors
79. The capabilities of the Raspberry Pi mini-computer as an operating system and IoT gateway
80. Reliability of communication channels and noise immunity in IoT systems
81. New capabilities provided by the Bluetooth 5.0 standard for IoT networks
82. Features of covering large geographical areas of LoRaWAN technology
83. Service-oriented architecture (SOA) and its role in IoT software
84. In decentralized computing and IoT systems Fog Computing
85. Cost and Performance Criteria When Choosing Cloud Platforms for IoT Projects
86. Using Software Simulators to Prototype IoT Systems
87. Designing Smart Device Enclosures Using IoT and 3D Modeling
88. Artificial intelligence experiments in studying human behavior through IoT devices
89. Cloud-native applications and their integration with IoT devices
90. Technical and engineering difficulties in implementing IoT solutions
91. Basic schematic rules for designing the hardware part of IoT systems
92. The format of IoT network connections and the structure of the transmitted data packet
93. Technical foundations for selecting a component base for project implementation
94. Calculating the cost of an IoT project and assessing economic efficiency
95. Forming a financial model and business plan for IoT-based startups
96. The role of IoT technologies in the global economy and promising areas
97. The difference between analog and digital signals in the operation of sensors and their processing
98. Interaction of Wi-Fi modules (e.g. ESP32) with the Arduino platform
99. Input-output functions of microcontroller pins (GPIO) and their programming
100. Types of modern biomimetic and smart sensors used in IoT applications

Head of Department **B.R. Azimov**

Responsible compiler **X.X. Mamirov**