SAMPLE PAPERS

DIPLOMA FIFTH SEMESTER EXAMINATION 2025 (JUT)

INTERNET OF THINGS

DIPLOMA WALLAH

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Full Marks: 70 marks | Time: 3 Hours

Instructions:

- Question No. 1 is compulsory.
- Answer any **FOUR** questions from the remaining (Q.2 to Q. 7 marks).

SECTION A (Compulsory)

Q.1 Multiple Choice Questions (7 × 2 = 14 Marks)

(i) Which of the following is NOT a standard IoT Level deployment template?

(A) IoT Level-1

(B) IoT Level-5

(C) IoT Level-7

(D) IoT Level-6

(ii) In the context of IoT System Management, what does YANG stand for?

(A) Yet Another Network Gateway

(B) Yet Another Next Generation

(C) Yielding Abstract Network Graph

(D) Yearly Analysis of Network Growth

(iii) Which interface on a Raspberry Pi is primarily used for serial communication?

(A) SPI

(B) UART

(C) I2C

(D) HDMI

(iv) Which of the following is considered a key "enabling technology" for IoT?

(A) Wireless Sensor Networks (WSN)

(B) Analog Telegraphy

(C) CRT Displays

(D) Mainframe Batch Processing

(v) Which component converts physical quantities like temperature into electrical signals?

(A) Actuator

(B) Sensor

(C) Gateway

(D) RFID Tag

(vi) NETCONF is a protocol used for:

(A) Wireless power transfer

(B) Network device configuration and management

(C) Video streaming

(D) Social media integration

(vii) IIoT stands for:

(A) Internal Internet of Things

(B) Intelligent Internet of Things

(C) Industrial Internet of Things

(D) Integrated Internet of Things

Q.2

(A) Define IoT. Explain the Physical Design of IoT (Things, Protocols) and the Logical Design of IoT (Functional Blocks, Communication Models) with a neat block diagram illustrating the overall concept. [7 Marks]

(B) Elaborate on the key IoT Enabling Technologies. Discuss the crucial role of Wireless Sensor Networks (WSN), Cloud Computing, and Big Data Analytics in forming a complete IoT ecosystem. [7 Marks]

Q.3

(A) Explain the concept of IoT Levels and Deployment Templates (Level-1 to Level-6). Give a clear example of a domain-specific IoT system and map it to an appropriate IoT Level. [7 Marks]

(B) Distinguish clearly between M2M (Machine-to-Machine) and IoT based on architecture, communication, and scope. Discuss the need for a dedicated IoT Systems Management solution. [7 Marks]

Q.4

(A) Explain the detailed process of IoT Systems Management using NETCONF-YANG. Describe the specific roles and advantages of the NETCONF protocol and the YANG data modeling language. [7 Marks]

(B) Describe the comprehensive IoT Design Methodology step-by-step (Purpose, Model, Functional, Operational View, Device/Resource Modeling, Service Specification). [7 Marks]

Q.5

(A) Discuss the theoretical role of Hardware Components (Sensors, Actuators, Smart Objects, RFID) and Software Components that form the basic building blocks of an IoT Device. [7 Marks]

(B) Explain the significance of Raspberry Pi interfaces (GPIO, SPI, I2C, UART) for connecting various peripherals in an IoT system. Briefly discuss Data storage on cloud/local server. [7 Marks]

Q.6

(A) Discuss the major Security, Privacy, and Governance issues in the context of IoT. Explain the purpose and stages of the IoT security life cycle and how it helps mitigate threats. [7 Marks]

(B) Select two Domain-specific IoT Case Studies (e.g., Health Care, Agriculture, or Urban Cities) and explain the system's objective, sensor requirements, and key functionalities in detail. [7 Marks]

Q.7 Write Short Notes on (Any FOUR): [4 × 3.5 = 14 Marks]

(A) IoT Communication APIs

(B) Request-Response vs. Publish-Subscribe Models

(C) SDN (Software-Defined Networking) for IoT

(D) Python Packages of interest for IoT

(E) Blockchain technology in IoT Security

✅ PAPER 1 - SOLUTIONS

MCQ Answer Key

1. **(C)** IoT Level-7 (Levels are usually 1-6)
2. **(B)** Yet Another Next Generation
3. **(B)** UART
4. **(A)** Wireless Sensor Networks (WSN)
5. **(B)** Sensor
6. **(B)** Network device configuration and management
7. **(C)** Industrial Internet of Things

Model Answers (Brief Hints)

Q.2(A) Physical/Logical Design:

- **Physical:** Things (Node/Device) + Protocols (Link/Network/Application layers).
- **Logical:** Functional Blocks (Sensing, Actuation, Processing) + Communication Models (Req-Res, Pub-Sub).
- **Diagram:** Show relationship between Things -> Gateway -> Cloud.

Q.2(B) Enabling Technologies:

- **WSN:** Collects data from environment.
- **Cloud:** Stores/processes massive data.
- **Big Data:** Extracts insights from data.

Q.7 Short Notes:

- **(A) APIs:** REST (Client-Server, Stateless) vs WebSocket (Full duplex).
- **(B) Req-Res vs Pub-Sub:** Req-Res is synchronous; Pub-Sub is asynchronous (Decoupled by Broker).
- **(C) SDN:** Separates Control plane from Data plane.