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 python package is commonly used for MQTT communication in IoT?

(A) pandas

(B) paho-mqtt

(C) numpy

(D) matplotlib

(ii) Which logical design block is responsible for sending and receiving data?

(A) Communication Models

(B) Services

(C) Security

(D) Application

(iii) In the context of IoT, what is the primary role of an Actuator?

(A) To sense the environment

(B) To store data in the cloud

(C) To perform a physical action based on a signal

(D) To encrypt network traffic

(iv) Which of the following is an example of an IoT Communication Model?

(A) Push-Pull

(B) Drag-Drop

(C) Click-Scroll

(D) Cut-Paste

(v) What does NFV stand for in IoT networking?

(A) Network File Verification

(B) Network Function Virtualization

(C) Near Field Video

(D) New Frequency Variable

(vi) Which level of IoT deployment involves a single device performing local analysis?

(A) IoT Level-6

(B) IoT Level-4

(C) IoT Level-1

(D) IoT Level-5

(vii) Smart Objects in IoT typically possess:

(A) Only mechanical parts

(B) No processing capability

(C) Processing, communication, and sensing capabilities

(D) Only storage capacity

Q.2

(A) Define IIoT (Industrial Internet of Things). Compare and contrast IoT and IIoT, focusing on their differences in terms of security, data volume, and criticality of applications. [7 Marks]

(B) Explain the concept of IoT Levels and Deployment Templates. Give a clear example of a Home Automation system and map it to an appropriate IoT Level, justifying your choice. [7 Marks]

Q.3

(A) Discuss the comprehensive IoT Design Methodology. Illustrate the steps using a Smart City case study example. [7 Marks]

(B) Explain the detailed process of IoT Systems Management using NETCONF-YANG. [7 Marks]

Q.4

(A) Distinguish clearly between M2M and IoT based on architecture, communication, and scope. [7 Marks]

(B) Discuss the theoretical role of Hardware Components (Sensors, Actuators, Smart Objects, RFID) in an IoT device. [7 Marks]

Q.5

(A) Explain the significance of Raspberry Pi interfaces (GPIO, SPI, I2C, UART) in an IoT system. [7 Marks]

(B) Define IoT. Explain the Logical Design of IoT including Functional Blocks and Communication Models. [7 Marks]

Q.6

(A) Elaborate on the key IoT Enabling Technologies (WSN, Cloud Computing, Big Data Analytics). [7 Marks]

(B) Discuss the major Security, Privacy, and Governance issues in the context of IoT. [7 Marks]

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

(A) Role of NFV (Network Function Virtualization)

(B) IoT Protocols (Application & Network Layer)

(C) Difference between Sensor and Actuator

(D) Smart Objects

(E) Governance in large-scale IoT deployments

✅ PAPER 2 - SOLUTIONS

MCQ Answer Key

1. **(B)** paho-mqtt
2. **(A)** Communication Models (or Communication Functional Block)
3. **(C)** To perform a physical action based on a signal
4. **(A)** Push-Pull
5. **(B)** Network Function Virtualization
6. **(C)** IoT Level-1
7. **(C)** Processing, communication, and sensing capabilities

Model Answers (Brief Hints)

Q.2(A) IIoT vs IoT:

- **IoT:** Consumer-centric, convenience (e.g., Smart Home), lower security criticality.
- **IIoT:** Industrial-centric, mission-critical (e.g., Oil rig), high security & reliability.

Q.3(A) Design Methodology:

- Steps: Purpose -> Process Specification -> Domain Model -> Information Model -> Service Specification -> Operational View -> Device Integration.
- **Example:** Smart City parking system design.

Q.7 Short Notes:

- **(A) NFV:** Virtualizes network services (firewalls, routers) to run on standard hardware.
- **(C) Sensor vs Actuator:** Sensor detects (Input); Actuator moves/controls (Output).