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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VIII - THEORY EXAMINATION (2025 - 2026)

Subject: Internet of Things

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C**. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.
2. Maximum marks for each question are indicated on right -hand side of each question.
3. Illustrate your answers with neat sketches wherever necessary.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.
6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

20

1. Attempt all parts:-

- | | | |
|-------|---|---|
| (1.1) | The Conceptual Framework of IoT primarily deals with:(CO1, K2) | 1 |
| | <ul style="list-style-type: none"> (a) Technical specifications of IoT devices (b) Market analysis of IoT products (c) Theoretical foundations and applications of IoT (d) Legal regulations regarding IoT implementation | |
| (1.2) | Integrated Development Environments (IDEs) are primarily used for: (CO1, K1) | 1 |
| | <ul style="list-style-type: none"> (a) Managing IoT devices remotely (b) Developing software applications (c) Analyzing big data generated by IoT devices (d) Configuring communication protocols for IoT networks | |
| (1.3) | Actuators in IoT devices are responsible for: (CO2, K2) | 1 |
| | <ul style="list-style-type: none"> (a) Sensing environmental changes (b) Transmitting data wirelessly (c) Processing data collected from sensors (d) Initiating physical actions based on received instructions | |
| (1.4) | The main advantage of using RFID technology for asset tracking in IoT systems is (CO2, K1) | 1 |
| | <ul style="list-style-type: none"> (a) High power consumption (b) High cost (c) Non-line-of-sight operation (d) Limited range | |

- (1.5) The purpose of an emulator in Arduino coding is (CO3, K1) 1
- (a) To simulate the behavior of an Arduino board
 - (b) To play video games
 - (c) To control traffic lights
 - (d) To generate random numbers
- (1.6) ESP8266 is commonly used for in IoT applications (CO3, K1) 1
- (a) To write poetry
 - (b) To paint pictures
 - (c) To control electronic devices wirelessly
 - (d) To cook food
- (1.7) The following messaging protocol is commonly used for lightweight communication in IoT applications. (CO4, K1) 1
- (a) MQTT
 - (b) TCP
 - (c) HTTP
 - (d) FTP
- (1.8) The following protocol is commonly used for controlling and monitoring IoT devices remotely over the Internet. (CO4, K1) 1
- (a) MQTT
 - (b) FTP
 - (c) HTTP
 - (d) CoAP
- (1.9) This is NOT a benefit of smart metering for consumers. (CO5, K1) 1
- (a) Easier meter reading
 - (b) More accurate billing data
 - (c) Improved power grid efficiency
 - (d) Reduced energy bills
- (1.10) The following is NOT a common feature of e-health apps. (CO5, K1) 1
- (a) Medication reminders
 - (b) Online consultations
 - (c) Symptom tracking
 - (d) Appointment scheduling

2. Attempt all parts:-

- (2.1) Identify and explain three components essential to IoT infrastructure. (CO1, K1) 2
- (2.2) Define the main components of an RFID system. (CO2, K1) 2
- (2.3) Define library that is used in Arduino programming. (CO3, K1) 2
- (2.4) Write the importance of https. (CO4, K1) 2
- (2.5) Write any two main benefits of using smart meters compared to traditional meters. (CO5, K1) 2

SECTION-B

30

Answer any one of the following:-

- (3.1) Discuss the evolution of IoT from its inception to its current state. (CO1, K2) 6
- (3.2) Compare between IoT and M2M communication. (CO1, K2) 6

Answer any one of the following:-

- (3.3) Explain Arduino Uno along with its pin diagram. (CO2, K2) 6
- (3.4) Explain the ultrasonic sensor along with its applications. (CO2, K2) 6

Answer any one of the following:-

- (3.5) Compare Arduino boards with Node MCU in terms of features, capabilities, and suitability for IoT projects. (CO3, K2) 6
- (3.6) Write a very simple Arduino coding example to blink an LED connected to a particular pin. (CO3, K2) 6

Question Instruction

Not Applicable

Answer any one of the following:-

- (3.7) Define BLE and explain its primary use in IoT applications. (CO4, K2) 6
- (3.8) Define CoAP protocol. Explain how does CoAP differ from traditional HTTP in IoT environments? (CO4, K2) 6

Answer any one of the following:-

- (3.9) Describe the various risk factors in IoT based automatic home security systems. (CO5, K2) 6
- (3.10) Describe the role of wearable devices in remote patient monitoring. (CO5, K2) 6

SECTION-C

50

4. Answer any one of the following:-

- (4.1) Examine the key characteristics of IoT. Discuss the potential impact of IoT on various aspects of our lives. (CO1, K2) 10
- (4.2) Examine the ethical considerations and societal implications of IoT deployment, including privacy concerns, data security, and potential job displacement. (CO1, K2) 10

5. Answer any one of the following:-

- (5.1) Explain the difference between active and passive sensors. Provide an example of each. Briefly discuss the advantages, disadvantages and applications of active and passive sensors . (CO2, K2) 10
- (5.2) Discuss the architecture of Node MCU boards. Describe the built-in connectivity and programming environment of Node MCU. (CO2, K2) 10

6. Answer any one of the following:-

- (6.1) Describe the anatomy of an Arduino board in detail, including the main components and their functions. Explain how each component contributes to the overall functionality of the board. (CO3, K2) 10
- (6.2) Develop an Arduino sketch that turns on an LED connected to pin 8 when a pushbutton connected to pin 2 is pressed and turns it off when the button is released. (CO3, K2) 10

7. Answer any one of the following:-

- (7.1) Explain secured data transfer. Discuss the various security measures taken during data transmission. (CO4, K2) 10
- (7.2) Discuss the role of HTTP in IoT communication. Explain how does HTTP enable interaction between IoT devices and web servers? (CO4, K2) 10
8. Answer any one of the following:-
- (8.1) Describe the various benefits of self-driving cars concept. Also describe the various key factors those must be controlled to reduce risks in self-driving cars. (CO5, K2) 10
- (8.2) Describe the fitness trackers along with its various tracking parameters. Discuss the advantages, disadvantages and applications of fitness trackers.(CO5, K2) 10

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