

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
Seventh Semester B.Tech Degree Examination December 2022 (2019 scheme)

**Course Code: ECT 445**  
**Course Name: IOT AND APPLICATIONS**

**Max. Marks: 100****Duration: 3 Hours****PART A***Answer all questions, each carries 3 marks.*

Marks

- |    |  |     |
|----|--|-----|
| 1  | What is the Internet of Things (IoT)? List any four real-time IoT applications in agro-ecosystems. | (3) |
| 2  | Describe the request-response communication paradigm in IoT logical design.                        | (3) |
| 3  | How constrained are wireless sensor networks by smart objects?                                     | (3) |
| 4  | In contrast to Machine to Machine (M2M), what distinguishes the Internet of Things?.               | (3) |
| 5  | Evaluate the similarities and differences between IEEE 802.15.4g, 802.15.4g, and 802.15.4e.        | (3) |
| 6  | Draw and discuss the layered structure of the LoRaWAN network.                                     | (3) |
| 7  | What are the four basic types of cloud deployment models?.   | (3) |
| 8  | Interface and control the status of an LED in GPIO 20 in Raspberry Pi.                             | (3) |
| 9  | What is message integrity? How is it checked.  | (3) |
| 10 | What are the Key Use Cases for Smart Cities?.  | (3) |

**PART B***Answer any one full question from each module, each carries 14 marks.***Module I**

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|----|---|-----|
| 11 | a) What are the different IoT layers? Describe the various protocols and services provided by each layer. | (8) |
|    | b) List the different IoT applications with appropriate illustrations.                                    | (6) |

**OR**

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|----|--|-----|
| 12 | a) Evaluate the architectures of IoT levels 4 and 5. Discuss any of the real-time applications included in those levels. | (8) |
|    | b) What are the various user cloud services in Iot applications?.  | (6) |

**Module II**

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|----|---|-----|
| 13 | a) What are smart objects? Describe the traits and tendencies of intelligent objects. | (8) |
|----|---|-----|

- b) Illustrate and describe the Software Defined Networking architecture. What are the main components of an SDN network? (6)

**OR**

- 14 a) What kind of smart sensors are utilized in IoT? Explain using appropriate illustrations and applications. (8)
- b) Define wireless sensor network. Discuss the severe limits of WSN's intelligent objects. (6)

**Module III**

- 15 a) Explain the differences between Narrowband-Internet of Things (NB-IoT) and Long-Term Evolution for Machines (LTE M). (8)
- b) Give specifics on the LoRaWAN standardization and alliances, and explain them in depth. (6)

**OR**

- 16 a) Describe the LoRaWAN architecture. The physical layer and MAC layer of LoRaWAN should be described in depth. (8)
- b) What protocols do we use on the internet that belong to the future generation? (6)

**Module IV**

- 17 a) Describe in detail the physical layer and MAC layer of LoraWAN. (8)
- b) Illustrate how to use the SPI and I2C protocols on Raspberry Pi to interface with sensors. (6)

**OR**

- 18 a) Utilizing Raspberry Pi, design and interface a circuit to read the state of a switch connected to GPIO-21 and display it on GPIO-20. (8)
- b) Explain the different cloud service and deployment models. (6)

**Module V**

- 19 a) What is the difference between security and privacy? List the five IoT vulnerabilities. (8)
- b) Explain the 4-layer smart city design using a diagram. (6)

**OR**

- 20 a) Discuss the implementation of an IoT-assisted smart lighting system in cities. (8)
- b) How might IoT and smart sensors be used to control traffic congestion in smart cities? Use comprehensive diagrams to explain. (6)

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