

COURSE CODE (CREDITS): 21M1WEC233 (3)

MAX. MARKS: 35

COURSE NAME: Applied Machine Learning for IoT

COURSE INSTRUCTORS: Dr. Vikas Baghel

MAX. TIME: 2 Hours

*Note: (a) All questions are compulsory.*

*(b) Marks are indicated against each question in square brackets.*

*(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems*

- Q1. a) What is the use of IoT protocols? List the major IoT protocols used in IoT deployments. [CO4] [3]
- b) What are the key components of an MQTT system? Explain the publish-subscribe messaging model used in MQTT. [3]
- c) What are the similarities and differences between CoAP and MQTT? [2]
- Q2. a) Describe the layers in the IoT architecture and their functions. [CO2] [3]
- b) Provide an overview of the Raspberry Pi, including its uses, advantages, and how it plays a significant role in IoT applications? [3]
- Q3. a) Explain the operating principle of the DHT11 sensor. Discuss the accuracy and resolution of the DHT11 sensor. Also describe the pin configuration of the DHT11 sensor. [CO4] [3]
- b) Explain the principle of operation behind a PIR motion sensor. Describe the components of a typical PIR motion sensor. How does the sensitivity of a PIR sensor affect its performance? [3]
- c) What is Current Sensor? Describe the working principle of the current sensor. [3]
- Q4. a) Explain the working principle of smart doorbell system. How does the integration of PIR motion sensor enhance the security features of a smart doorbell system? [CO5] [4]
- b) How can the integration of IoT sensors enhance the accuracy of Machine Learning-based Weather Forecasting Models, and what key considerations are involved in developing such a system? [4]
- c) Provide an overview of a Smart Energy Monitoring System that utilizes machine learning techniques? Also, discuss the advantages and disadvantages of implementing such a system? [4]