

1129
B.E. (Computer Science and Engineering)
Seventh Semester
Elective – III
CS-705E: Smart System Design

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

- I. Attempt the following:-
- a) What do you understand by sensitivity of a sensor? Discuss in brief.
 - b) Differentiate between active and passive sensors.
 - c) List two major advantages of MEMS in the design of smart sensors.
 - d) How USTI is different from UFDC-2? Discuss in brief.
 - e) What is MQTT? What is its role in an IoT system? Discuss in brief. (5x2)

UNIT – II

- II. a) What are the advantages of quasi-digital sensors? How the terms frequency, period, pulse width, spacing interval, duty cycle, off-duty factor, pulse number and phase shift relate with each other? Discuss with the help of a diagram.
- b) What are the main advantages of making frequency as the sensor's output signal? Discuss. (2x5)
- III. a) What is UFDC-1? What is its purpose? What are its application areas? Discuss.
- b) How Optical Sensors can be interfaced with UFDC-1? Discuss with the help of a diagram showing any optical sensor and its connections with UFDC-1. (2x5)
- IV. Diagrammatically explain the interfacing of following sensors with UFDC-1:
- a) Rotation Speed Sensors
 - b) Digital Magnetic Sensors (2x5)
- V. a) Describe the following terms with respect to IEEE 1451 family of standards: TEDS, STIM, NCAP, TII
Also discuss how these terms relate to each other.
- b) Explain any two IoT communication models with the help of suitable diagrams. (2x5)

(2)

- VI. a) How capacitive sensors can be directly interfaced with microcontrollers? Discuss with the help of a diagram.
- b) What are the applications of IoT in the areas of healthcare and home automation? Discuss. (2x5)
- VII. Explain SoC systems in detail highlighting the types, applications, structure and optimization goals. (10)

X-X-X