



Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

2nd Trimester Final Examination, Summer 2023

Duration: 3 Hours

Course Code: PMIT - 6223

Full Marks: 60

Course Title: IoT and Fog Computing

Do not write anything on the question paper.
There are 7 (Seven) questions. Answer any 5 (Five) of them.
Figures in the right margin indicate marks.

1. a) Define the internet of things. Briefly explain the evolution of internet of things from the pre-internet era. Also list their key features. 6
b) Explain the technological roadmap of internet of things. Also describe the relation between the internet of things and big data. 6
2. a) Explain how the internet of things helps to develop the autonomous car. Also describe the role of internet of things for connecting roadways. 6
b) Define the internet of things' trustworthiness. Does the inclusion of the mist layer in the internet of things architecture increase the trustworthiness? Explain your response. 6
3. a) Describe the characteristics of the following components with their applications: (i) Transducer, (ii) Sensor and (iii) Actuator. 6
b) Explain how the Poisson's ratio and gage factor can be used to determine the resistance of a wire. 4
c) Sketch a diagram to show the typical electronic sensor system. 2
4. a) List the characteristics of fog-computing. 2
b) Describe the differences between the five-layered IoT architecture and the fog-based IoT architecture. 5
c) Using a suitable block diagram, explain the policy framework of fog computing application in internet of thing. 5
5. a) Explain the data dissemination and data gathering process in a wireless sensor network. Also discuss the goals and the performance metrics of data gathering algorithms. 6
b) Calculate the delay involved in reaching a message to a base station using PEGASIS. How the delay can be reduced? Explain the process and justify your answer. 6
6. a) Write a short note the Zigbee alliance. Also mention its advances. 6
b) Describe the characteristics of IEEE 802.15.4 MAC. Sketch the MAC frame format of IEEE 802.15.4 and briefly explain each attribute of the MAC frame. 6
7. a) State the important characteristics of WSN. 3
b) Discuss in detail the design principles for Internet of Things system considering an example that you are asked to design for air quality monitoring in Dhaka City. 9