



Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

2nd Trimester Final Examination, Spring 2023

Duration: 3 Hours

Full Marks: 60

Course Code: PMIT – 6223

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.

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| 1 | a) | Using a suitable block diagram briefly explain the components in Internet of Things. | 4 |
| | b) | Write about RFID technology and its application in Internet of Things. | 4 |
| | c) | Explain the eco-system of Internet of Things. | 4 |
| 2 | a) | What is transducer? Classify the transducer. Is there any difference between a smart sensor and a transducer? Justify your answer. | 6 |
| | b) | Explain the working of the following sensors: (i) inductive sensor, (ii) capacitive sensor and (iii) piezoelectric sensor. | 6 |
| 3 | a) | Explain the working of different temperature sensors. | 5 |
| | b) | Suppose you are asked to use a temperature sensor to detect a temperature range from 300 to 400 and the linearity is required. Which type of temperature sensor do you like to use and why? | 4 |
| | c) | State the steps for connecting a sensor to a microcontroller. | 3 |
| 4 | a) | Mention the limitations of cloud computing in the field of internet of things. Also explain how these limitations can be overcome using fog computing. | 5 |
| | b) | Describe the policy-based orchestration framework of fog technology using a suitable block diagram. | 3 |
| | c) | Explain how the vision of the fog computing can be achieved in smart healthcare and in smart city. | 4 |
| 5 | a) | Suppose you are requested to identify and count the cars in your locality using sensors. For this case which network between the wireless sensor network and ad-hoc sensor network is suitable? Justify your answer. | 4 |
| | b) | Describe the limitation of flooding algorithm for data dissemination in WSN. Explain how these limitations can be overcome using gossiping and SPIN algorithm. | 8 |
| 6 | a) | What are the major issues and challenges that need to be considered while designing WSN? Briefly explain them. | 8 |
| | b) | Mention the delay of the PEGASIS algorithm for data fusion in WSN. Can the delay be improved using any modified algorithm? Justify your answer. | 4 |
| 7 | a) | Explain the technology roadmap of internet of things. | 4 |
| | b) | Air pollution is a severe crisis in Dhaka city. Do you think that air pollution can be reduced by using the internet of thing technology? Justify your answer. Also design a system using internet of thing to monitor the air quality in Dhaka city. | 8 |