UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: B.Tech CS-TI	**Semester : 7th**
Subject (Course): Machine to Machine Communication	**Max. Marks : 100**
Course Code : CSIB486	**Duration : 3 Hrs**
No. of page/s: 2	

*This paper consists of 3 sections as **Section A, Section B** and **Section C** having **20, 40 and 40 Marks** respectively. The guidelines for each section are given separately at the start of the section. Answer should be point to point and precise not going beyond the provided word limit. Use diagrams wherever mentioned/required.*

Section A (Marks: 20)

Attempt ALL questions. The marks for each question are written alongside with the question.

1. What do you mean by Home Automation? How smart home data collection and analysis helps in making the future houses smarter? [5 Marks]

2. List out various verticals and their significance of Machine to Machine communication. [5 Marks]

3. What are different M2M network devices? How they differ from traditional network devices? [5 Marks]

4. What are the building blocks of an RFID System? Explain with the help of labelled diagram. [5 Marks]

Section B (Marks: 40)

Attempt ALL questions. The marks for each question are written alongside with the question.

5. What are the different communication technologies used in M2M communication? Compare them on the basis of range, latency, setup time, addressability and transmission power. [10 Marks]

6. What are the different design approaches for M2M service layers? Name the existing APIs and protocols for M2M service layer. [10 Marks]

7. What are different types of sensors used in M2M communication? Explain each one of them with the help of labelled diagram. [10 Marks]

8. What are the different requirements of M2M communication? Differentiate USIM card and SIM card. [10 Marks]

Section C (Marks: 40)

Attempt ALL questions. The marks for each question are written alongside with the question.

9. (a) What are the security threats for Machine to Machine Communication? Explain the terms validation and verification in relation to communication between different machines. [10 Marks]

(b) Explain WSN Architecture along with their design challenges in detail. How 3G network architecture is differ from 4G network architecture. Explain with the help of labelled diagram. [10 Marks]

10. Explain the Anatomy of M2M Communication? What are its application domains? Explain with the help of labelled diagram the RFID vehicle tracing and tagging on the basis of various design factors. [20 Marks]

Roll No: ----------

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Section A (Marks: 20)

Attempt ALL questions. The marks for each question are written alongside with the question.

1. How M2M communication and IoT are related to each other? Explain with the help of labelled diagram. [5 Marks]

2. How health care, logistics, transportation, retail industry and building construction will use machine to machine communication for their benefits? Explain. [5 Marks]

3. Explain with diagram the RF-powered sensor node architecture. [5 Marks]

4. What are the hardware, software and functional requirements of M2M communication? Explain with the help of labelled diagram. [5 Marks]

Section B (Marks: 40)

Attempt ALL questions. The marks for each question are written alongside with the question.

5. List out the steps involved in connecting existing systems/ applications in M2M Environment. [10 Marks]

6. Explain the architecture of component based M2M reference model. Describe the layer wise components of M2M infrastructure. [10 Marks]

7. Explain the functions and types of sensors used in Machine to Machine communication. [10 Marks]

8. Differentiate USIM card and SIM card. How RFID vehicle tracing and tagging can be done with the help of M2M communication. [10 Marks]

Section C (Marks: 40)

Attempt ALL questions. The marks for each question are written alongside with the question.

9. Explain the architecture and design challenges of Wireless sensor networks. Chalk out the concepts of M2M based tracking application and M2M based infrastructure monitoring. [20 Marks]

10. (a) Explain how location tracking can be done by using M2M communication devices. [10 Marks]

(b) List out the major considerations of M2M product design. Explain how it will affects the communication between different machines in a network. [10 Marks]