MANIPAL
ACADEMY of HIGHER EDUCATION
(Institution of Eminence Deemed to be University)

END SEMESTER EXAMINATIONS (DECEMBER 2023)

VII SEM. B.TECH COMPUTER SCIENCE AND ENGINEERING

CSE 4057 – INTERNET OF THINGS (PE-V)

DURATION: 3 HRS **MARKS: 50**

Q. No	Question	Marks
1A	Describe the below design principles for the connected devices with a relevant scenario/use case for each. i) Holistic view of the device. ii) Device interoperability. iii) Operating conditions of the device.	3M
1B	Illustrate the layered architecture of IoT with a neat diagram.	4M
1C	Discuss the use of IoT in the following applications. i) Urban agriculture. ii) Food safety.	3M
2A	Write about the following M2M data with suitable examples. i) Passive devices data. ii) Active devices data. iii) Event data from device. iv) Device real-time data.	4M
2B	Write on the below M2M use cases. Please make sure to discuss the use case completely including the asset, M2M device, information sent, and business process. i) Remotely monitoring elderly people at home. ii) Remote crop monitoring for infection. iii) Remote vehicle diagnostics.	3M
2C	Clarify how the Internet, VLSI, and low-power embedded technologies act as enabling technologies for IoT.	3M
3A	Describe the SaaS, PaaS, IaaS cloud services. State what the users of these services can/cannot control in each of them. Also, give examples of SaaS, PaaS, and IaaS service providers for IoT.	3M
3B	Discuss the following stages in the context of IoT data management.	

	i) Data remanence. ii) Data analysis.	4M
3C	Discuss the merits of REST APIs (when used over CoAP) in the following terms. i) Scalable. ii) Error reporting and monitoring. iii) Resource attacks. iv) Caching.	3M
4A	Consider that a button is connected to GPIO pin 16 of Raspberry Pi. Assume, this button mimics a button that is used by the people of a particular building to key in situation of emergency to the rescue team. Write a python code that obtains the status of the button, checks the status, and alerts if the button status is pressed. The alert notification is given by making a LED (connected to GPIO pin 18 of Raspberry Pi) blink quite often once in every 200 milliseconds.	4M
4B	Illustrate the role of sketching in IoT prototyping with an example.	3M
4C	i) Clarify how closed source approach would assist the designers and developers in the context of IoT prototyping. ii) Enumerate the factors that you would consider while choosing the hardware platform for your IoT device.	3M
5A	Design a high-level architecture for smart healthcare and its integration with smart city.	4M
5B	Devise a high-level architecture for waste management in smart cities.	4M
5C	Write on the use of IoT gateways for the following. i) Device management. ii) Hosting local applications.	2M