Paper ID: 44614 **L** **T/P** **C**
Code: IT614 **Paper: Internet of Things** **4** **0** **4**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks: 75**
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks

Employability, Entrepreneurship & Skill Development

Course Outcomes:

CO 1	To introduce the terminology, technology and its applications. M2M (machine to machine) with necessary protocols
CO 2	To introduce the Python Scripting Language which is used in many IoT devices
CO 3	To introduce the Raspberry PI platform, that is widely used in IoT applications
CO 4	To introduce the implementation of web-based services on IoT devices

Course Outcomes -Program Outcomes Matrix

Filled on a scale of 1 to 3 (3=High; 2=Moderate; 1=Low; '-'for no correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	-	1	-	1	1	-	1	1	-	-	-	-
CO 2	-	1	-	1	2	-	1	1	-	-	-	-
CO 3	-	1	-	1	1	-	1	1	-	-	-	-
CO 4	-	1	-	1	1	-	1	1	-	-	-	-

UNIT 1

Introduction to Internet of Things –Definition and Characteristics of IoT, Physical Design of IoT – IoT Protocols, IoT communication models, Iot Communication APIs, IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates, Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.

UNIT 2

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT. Basics of IoT System Management with NETCOZF, YANG- NETCONF, YANG, SNMP NETOPEER

UNIT 3

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib

UNIT 4

IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins. IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs Webserver – Web server for IoT, Cloud for IoT, Python web application framework Designing a RESTful web API.

Text Books:

1. ArshdeepBahga and Vijay Madisetti ,"Internet of Things - A Hands-on Approach" , Universities Press, 2015, ISBN: 9788173719547
2. Matt Richardson & Shawn Wallace ,"Getting Started with Raspberry Pi", O'Reilly (SPD), 2014, ISBN: 9789350239759

References Books:

1. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press, 2014
2. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications, 2013