INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad -500 043

COMPUTER SCIENCE AND ENGINEERING

TUTORIAL QUESTION BANK

Course Title	**IoT WITH PYTHON PROGRAMMING**				
Course Code	ACS806				
Programme	B.Tech				
Semester	VII	CSE			
Course Type	SKILL				
Regulation	IARE - R16				
Course Structure	**Theory**			**Practical**	
	Lectures	**Tutorials**	**Credits**	**Laboratory**	**Credits**
	-	-	-	-	-
Chief Coordinator	Ms. G Nishwitha, Assistant Professor				
Course Faculty	Ms. G Srilekha,Assistant Professor				

COURSE OBJECTIVES:

The course should enable the students to:

I.	Understand the architecture of Internet of Things and connected world.
II.	Explore on use of various hardware and sensing technologies to build IoT applications.
III.	Illustrate the real time IoT applications to make smart world.
IV.	Understand the available cloud services and communication API_s for developing smart cities.

COURSE OUTCOMES (COs):

I	Understand the concept of Internet of Things and connected world.
II	Explore on use of various hardware and sensing technologies to build IoT applications.
III	Illustrate the architecture of Internet of Things and python.
IV	Understand the working with python on intel galileo gen.
V	Explore on Interacting with digital outputs with python

COURSE LEARNING OUTCOMES (CLOs):

SI. No.	Description
ACS806.01	Understand and intuition of the whole process line of extracting knowledge from data about the Internet of Things.
ACS806.02	Deep insight in one ofthespecializationswithin the network, depending on thestudyand the choice of the concepts of IoT.
ACS806.03	Solid knowledge in a broad range of methods based on design and implementation of IoT in network performance, analysis and problem solving with design of networks.
ACS806.04	Experience in deriving theoretical propertiesof methods involved in IoT.
ACS806.05	Design and implementation/modification ofmethods involved in IoT.
ACS806.06	Describe what IoT is and the skill sets neededto be a network analysis.
ACS806.07	Use IoT design to carry out basic statistical modeling and analysis.
ACS806.08	Motivate and explain trade-offs in IoT tool technique design and analysis of applications with IoT.
ACS806.09	Understand significance of models in IoT.
ACS806.10	Describe the transport layer protocols andhow its uses in IoT.
ACS806.11	Apply basic IoT algorithms for predictivenetwork performance.
ACS806.12	Understand basic terms what security issues.Identify key distribution methods.
ACS806.13	Identify common approaches used forFeature Generation of IoT.
ACS806.14	Create effective results by using various techniques in IoT application.
ACS806.15	Analyze the importance of IoT applications and work effectively as individual or teams on various IoT projects.

TUTORIAL QUESTION BANK

S. No	QUESTION	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes
UNIT - I INTRODUCTION TO INTERNET OF THINGS (IoT)				
Part - A (Short Answer Questions)				
1	What is IoT? Write short notes on IoT.	Remember	CO1	ACS806.01
2	List any four characteristics of IoT.	Remember	CO1	ACS806.01
3	State the importance of IoT.	Remember	CO1	ACS806.01
4	What is the Thing in IoT?	Understand	CO1	ACS806.01
5	State about the importance of Thing in IoT.	Remember	CO1	ACS806.02
6	Write the any three functions of IoT.	Understand	CO1	ACS806.02
7	What are design factors IoT ?	Understand	CO1	ACS806.02
8	What are the interfaces of WSN.	Remember	CO1	ACS806.03
9	Define link layer protocols in IoT.	Remember	CO1	ACS806.04
10	State any four domain specific IoT applications.	Remember	CO1	ACS806.03
Part - B (Long Answer Questions)				
1	Discuss the characteristic of IoT and explain.	Understand	CO1	ACS806.01
2	What are applications of IoT and explain?	Remember	CO1	ACS806.01
3	Demonstrate the physical design of IoT with Things of IoT and protocols of IoT.	Remember	CO1	ACS806.02
4	Write the logical design of IoT withcommunication models.	Understand	CO1	ACS806.02
5	Explain the IoT communication APIs and its importance.	Understand	CO1	ACS806.02
6	Discuss about any three IoT enablingtechnologies.	Remember	CO1	ACS806.03
7	Illustrate the IoT level 1 with diagram.	Understand	CO1	ACS806.03
8	Differentiate the IoT level 2 and level 4 in detailed.	Understand	CO1	ACS806.03
9	Explain the IoT level 3 and level 5 with diagrams.	Understand	CO1	ACS806.04
10	Define the various domain specific of IoT and explain withhome automation.	Understand	CO1	ACS806.04
Part – C (Critical Thinking Questions)				
1	Describe with an example of IoT service that uses publishsubscribe and web socket based communication.	Understand	CO1	ACS806.01
2	Determine the IoT levels for designing home automation IoT system including smart lighting and intrusion detection.	Understand	CO1	ACS806.02
3	Determine the various communication models that can be used for weather monitoring system. Which is a more appropriate model for this system. Describe the pros andcons.	Remember	CO1	ACS806.02
4	In Forest fire detection which level of IoT is used? Explainwith a neat diagram and its working principle.	Understand	CO1	ACS806.03

5	Determine the IoT levels for designing structural healthmonitoring. Explain with a neat diagram.	Remember	CO1	ACS806.04
UNIT – II IoT AND M2M				
Part – A (Short Answer Questions)				
1	Write a short note on M2M?	Understand	CO2	ACS806.05
2	Give the purpose of communication protocols used in M2M?	Remember	CO2	ACS806.05
3	State Software Defined Networking?	Remember	CO2	ACS806.06
4	Discuss the purpose of ConventionalNetworks?	Remember	CO2	ACS806.06
5	List the advantages of SDN?	Understand	CO2	ACS806.06
6	What is Network Function Virtualization?	Understand	CO2	ACS806.07
7	State the differences and similarities between IoT and M2M?	Remember	CO2	ACS806.07
8	How do data collection and analysis approaches differ in M2M andIoT?	Remember	CO2	ACS806.07
9	Differentiate between configuration and state data?	Understand	CO2	ACS806.08
10	What is the function of a data model manager?	Understand	CO2	ACS806.08
Part - B (Long Answer Questions)				
1	Differentiate between IoT and M2M.	Remember	CO2	ACS806.05
2	Explain the limitations of conventional network architectures.	Understand	CO2	ACS806.05
3	Discuss about the key elements of SDN	Understand	CO2	ACS806.05
4	Describe how SDN can be used for various levels of IoT.	Remember	CO2	ACS806.06
5	What is the function of a centralized network controller inSDN.	Understand	CO2	ACS806.06
6	Define network function virtualization and explain with neatdiagram.	Remember	CO2	ACS806.07
7	Discuss about network function virtualization with example.	Understand	CO2	ACS806.07
8	Describe the IoT system management in detailed.	Remember	CO2	ACS806.08
9	What is the role of IoT NETCONF-YANG management?	Remember	CO2	ACS806.08
10	Discuss about the IoT NETCONF-YANG with components.	Remember	CO2	ACS806.08
Part – C (Critical Thinking Questions)				
1	What is the function of centralized network controller inSDN? Differentiate between SDN and NVF.	Understand	CO2	ACS806.05
2	What are the differences between Machines in M2M andthings in IoT and communication protocols in M2M and IoT?	Understand	CO2	ACS806.05
3	Why is network wide configuration important for IoT systemswith multiple nodes? Explain with an illustration.	Understand	CO2	ACS806.05
4	What is the role of NETCONF server? Explain its significance in IoTsystemManagement withNETCONFYANG?	Understand	CO2	ACS806.06
5	Describe the roles of YANG and Trans API modules indevice management, with a neat sketch.	Understand	CO2	ACS806.06

UNIT-III IOT ARCHITECTURE AND PYTHON				
Part – A (Short Answer Questions)				
1	Define node.	Understand	CO3	ACS806.07
2	What is gateway?	Remember	CO3	ACS806.07
3	State node structure used in IoT.	Understand	CO3	ACS806.08
4	What is state of art?	Remember	CO3	ACS806.09
5	List out various IoT devices used in reference model?	Understand	CO3	ACS806.08
6	Define package?	Remember	CO3	ACS806.07
7	Differentiate procedure oriented programming and objectoriented programming?	Understand	CO3	ACS806.08
8	What is the use of keyword argument in Python?	Understand	CO3	ACS806.08
9	Illustrate the IoT data types and data structures with example?	Remember	CO3	ACS806.07
10	Explain working with lists in Python?	Understand	CO3	ACS806.09
Part - B (Long Answer Questions)				
1	Explain the architecture reference model IoT.	Remember	CO3	ACS806.07
2	Demonstrate the IoT architecture with diagram and explain.	Understand	CO3	ACS806.07
3	Describe the working of modules in Python.	Understand	CO3	ACS806.07
4	Illustrate the IoT data types and data structures with example.	Remember	CO3	ACS806.08
5	Explain about i) control flow ii) packages iii) file handling of IoT.	Remember	CO3	ACS806.08
6	What type of Architecture reference model is used for IoTand explain.	Understand	CO3	ACS806.08
7	Discuss about IoT reference model with diagram.	Remember	CO3	ACS806.09
8	What is State of the art introduction of IoT architecture?	Understand	CO3	ACS806.09
9	Explain about various stages of IoT with neat diagram.	Remember	CO3	ACS806.07
10	What is the importance of IoT architecture and explain?	Understand	CO3	ACS806.09
Part – C (Critical Thinking Questions)				
1	An Architectural Reference Model (ARM) can be visualized as the matrixthat eventually derives into a large set of concrete IoT architectures. Justify your answer with neat diagram.	Understand	CO3	ACS806.07
2	In any metamorphic representation IoT ARM can represented in the form of a tree. Represent it and explain its parts relate to IoT.	Understand	CO3	ACS806.07
3	The foundation of the IoT Reference Model is the IoT Domain Model, which introduces the main concepts of the Internet of Things like Devices, IoT Services andVirtualEntities(VE). Justify your answer with a neat sketch and explain.	Understand	CO3	ACS806.08
4	What is the difference between a Python module and apackage? Illustrate with an example.	Understand	CO3	ACS806.08
5	How is function overriding implemented in Python? Explainwith an example.	Understand	CO3	ACS806.09

UNIT-IV WORKING WITH PYTHON ON INTEL GALILEO GEN				
Part – A (Short Answer Questions)				
1	What are the core default modules available in python? Listdown a few of them.	Remember	CO4	ACS806.10
2	Why is <__init__.py> module used in python?	Remember	CO4	ACS806.10
3	What is a negative index in python?	Remember	CO4	ACS806.10
4	What is pickling and how does it differ from unpickling?	Remember	CO4	ACS806.11
5	What is slicing in python? Explain with example.	Remember	CO4	ACS806.11
6	What are the different ways to generate random numbers in python?	Remember	CO4	ACS806.11
7	Why is the "pass" keyword used for in python?	Understand	CO4	ACS806.12
8	What are iterators in python?	Understand	CO4	ACS806.12
9	What are the generators in python?	Remember	CO4	ACS806.12
10	How to run a subprocess or an external program with arguments in python?	Remember	CO4	ACS806.11
11	Explain Shallow and Deep Copy of an Object with the help of a Python Program.	Understand	CO4	ACS806.11
12	Explain how Copying of an Object will be alternate to Aliasing. Write a Python program to demonstrate Copying an Object.	Remember	CO4	ACS806.11
13	Explain Pure and Modifier functions in Python with an example program	Understand	CO4	ACS806.12
14	What are Python decorators?	Understand	CO4	ACS806.12
15	What is the difference between list and tuple?	Remember	CO4	ACS806.10
16	What is Dict and List comprehensions are?	Understand	CO4	ACS806.10
17	What are the built-in type does python provides?	Understand	CO4	ACS806.12
18	Mention the use of // operator in Python?	Remember	CO4	ACS806.12
19	Mention the use of the split function in Python**?**	Remember	CO4	ACS806.12
Part – B (Long Answer Questions)				
1	Explain parsing of HTML using Beautiful Soup Library	Understand	CO4	ACS806.10
2	Explain in detail how to retrieve a text and non-text (or binary) file such as an image	Remember	CO4	ACS806.10
3	Video file directly from a remote server with the help of a program.	Remember	CO4	ACS806.10
4	Explain in detail Tree representation and parsing of XML in Python using a program.	Understand	CO4	ACS806.10
5	Explain how to display all the nodes of XML with the help of a program.	Understand	CO4	ACS806.10
6	Explain Google geocoding web service used in Python with the help of a program.	Remember	CO4	ACS806.11
7	Explain twitter web service used in Python with the help of a program.	Understand	CO4	ACS806.11
8	Explain in detail JSON and parsing of JSON in Python using a program.	Understan d	CO4	ACS806.11
9	Explain working with python on intel galileo gen	Understand	CO4	ACS806.11
10	What are types of Operator are used in Python?	Remember	CO4	ACS806.11

11	Explain various keys and constraints used in SQLite while creating relations.	Remember	CO4	ACS806.12
12	Explain JOIN used in SQL to retrieve data from SQLite database.	Understand	CO4	ACS806.12
13	What is Database Cursor? Explain in detail.	Understand	CO4	ACS806.12
14	Explain connecting to the board's operating system	Remember	CO4	ACS806.12
15	Explain SOA and API in detail.	Understand	CO4	ACS806.10
16	How to set up the board to work with Python as the programming language	Understand	CO4	ACS806.10
17	Explain Retrieving the board's assigned IP address	Understand	CO4	ACS806.10
18	Explaininstalling and upgrading the necessary libraries to interact with the board	Remember	CO4	ACS806.11
19	Explaininstalling pip and additional libraries	Understand	CO4	ACS806.11
20	Explaininvoking the Python interpreter.	Remember	CO4	ACS806.11
Part – C (Critical Thinking Questions)				
1	Write a Python program to create table, insert and display the data from a database.	Understand	CO4	ACS806.11
2	Write a Python program to create table, delete and display the data from a database.	Understand	CO4	ACS806.11
3	Write a program to retrieve the data for http://data.pr4e.org/romeo.txt and compute the frequency of each word in the file.	Understand	CO4	ACS806.12
4	Write a Python program to retrieve an image across using HTTP.	Understand	CO4	ACS806.12
5	Write a Python program to display all the links from the web page and explain Spider.	Understand	CO4	ACS806.11
6	Write a Python program to explain how Objects are Mutable.	Understand	CO4	ACS806.11
7	Explain programming with multiple tables in Python using SQLite DB	Remember	CO4	ACS806.10
8	Explain the init, str, add_ methods with the help of a Python program.	Remember	CO4	ACS806.10
9	Explain operator overloading in Python with the help of code snippets.	Understand	CO4	ACS806.10
10	Explain operator overloading in Python with the help of code snippets.	Understand	CO4	ACS806.11
UNIT-V INTERACTING WITH DIGITAL OUTPUTS WITH PYTHON				
Part - A (Short Answer Questions)				
1	How to remove the duplicate elements From The Given List? Words = [‘one’, ‘one’, ‘two’, ‘three’, ‘three’, ‘two’]	Understand	CO5	ACS806.13
2	How to Print the sum of numbers starting from 1 To 100 (Inclusive Of Both)?	Remember	CO5	ACS806.13
3	What is the best approach to store a list of an employee’s first and last names?	Remember	CO5	ACS806.13
4	Does python allow arguments pass by value or pass by reference?	Remember	CO5	ACS806.14
5	What are the different methods python provides for copying an object?	Understand	CO5	ACS806.14
6	How to convert a string to a number in Python?	Understand	CO5	ACS806.14
7	How to set a global variable inside a function?	Remember	CO5	ACS806.15
8	How to Share Global Variables Across Modules?	Remember	CO5	ACS806.15

9	Is there a tool to help find bugs or perform the static analysis?	Understand	CO5	ACS806.15
10	How to Perform Unit Testing In Python?	Understand	CO5	ACS806.15
11	How to run a python program? Explain	Understand	CO5	ACS806.15
12	Explain building blocks of a program.	Understand	CO5	ACS806.15
13	Explain general types of errors with examples.	Remember	CO5	ACS806.13
14	Explain the following with examples, a)values and types b)variables c)keywords	Remember	CO5	ACS806.13
15	Explain order of operation in python? (Precedence)	Understand	CO5	ACS806.13
16	Explain input() function in python with examples?	Understand	CO5	ACS806.14
Part - B (Long Answer Questions)				
1	Explain the following in python with example, 9. a)comments b)input() c)type()	Remember	CO5	ACS806.13
2	Explain the following with examples, a)logical operators b)Boolean Expression	Understand	CO5	ACS806.13
3	Explain i) infinite Loop 2)finite loop with example code	Understand	CO5	ACS806.13
4	Explain turning on and off an onboard component	Remember	CO5	ACS806.13
5	Explain Interacting with digital outputs with python	Understand	CO5	ACS806.14
6	Explain how functions are handled in python with example.	Understand	CO5	ACS806.14
7	Explain how to create function with and without parameters in python? Explain with the help of a program	Remember	CO5	ACS806.14
8	Explain string functions(methods) with examples.	Understand	CO5	ACS806.15
9	Explain turning on and off an prototyping with breadboards.	Understand	CO5	ACS806.15
10	Explain the following a)in operator b)string comparison c)format operators	Remember	CO5	ACS806.15
11	Explain working with schematics to wire digital outputs	Understand	CO5	ACS806.15
12	Explain Counting from 1 to 9 with LEDs	Understand	CO5	ACS806.15
13	Advantage of object-oriented code to control digital outputs	Remember	CO5	ACS806.15
14	How to improve object-oriented code to provide new features	Understand	CO5	ACS806.14
15	Explain isolating the pin numbers to improve wirings	Understand	CO5	ACS806.14
16	Controlling digital outputs with the wiring-x86 library.	Remember	CO5	ACS806.15
Part – C (Critical Thinking Questions)				
1	Explain “continue and break” statements in python with example program	Understand	CO5	ACS806.13
2	Explain fruitful and void functions in python with example code.	Remember	CO5	ACS806.13
3	Explain different types of looping statements in python with example code.	Understand	CO5	ACS806.13
4	Predict the output for the following, a)f1=’10’ f2=’20’ print(f1+f2)	Understand	CO5	ACS806.14

	b) 7//3 c)3*2**3 d)min("Welcome to HKBK") e)3**3 f)2**3+2**3			
5	Predict the output for the following, a) a='5' b='2' c=a+b print(c) b) 11//3 c)3+5**2*3/2 d)max("Welcome to HKBK") e)(3**3)//2 f)2**3+2**3	Understand	CO5	ACS806.15
6	Predict the output of the following, st="abcdefghijkl" a)print(st[0:5]) b)print(st[6:13]) c)print(st[:]) d)print(st[:2]) e)print(st[2:]) f)print(st[-10])	Understand	CO5	ACS806.15

Prepared by:

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