SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF

COMPUTER SCIENCE AND ENGINEERING

QUESTION BANK

II SEMESTER

1912203- INTERNET OF THINGS

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DEPARTMENT OF CSE
QUESTION BANK

SUBJECT : CP5292 - INTERNET OF THINGS

SEM / YEAR: II Sem / I Year

UNIT I - INTRODUCTION TO IoT			
Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models- Machine to Machine, Difference between IoTand M2M, Software define Network			
PART – A			
Q. No	**Questions**	**BT Level**	**Competence**
1	**Illustrate** the evolutionary trend towards building a IoT?	BTL 3	Applying
2	**List and explain** in brief about Features of IoT?	BTL 1	Remembering
3	**Describe** the applications of IoT?	BTL 1	Remembering
4	**Define** IoT and how its works.	BTL 1	Remembering
5	**Analyze** the physical design of IoT.	BTL 4	Analyzing
6	**Give** the basic operations in IoT.	BTL 3	Applying
7	**List** out various IoT Protocol.	BTL 1	Remembering
8	**Differentiate** web of things and IoT.	BTL 4	Analyzing
9	**Examine** whether M2M and IoT are same?	BTL 3	Applying
10	**Explain** why indexes are created in physical database design?	BTL 2	Understanding
11	**Differentiate** between Logical and physical design.	BTL 2	Understanding
12	**Formulate** the IoT maturity levels.	BTL 6	Creating
13	**Summarize** the IOT communication models.	BTL 5	Evaluating
14	**Highlight** the importance of Domain specific IoTs.	BTL 2	Understanding

15	**How** IoT communications APIs are classified?	BTL 1	Remembering
16	**Tabulate** the different levels of Machine to Machine communication.	BTL 4	Analyzing
17	**What** constitutes the IOT platform?	BTL 1	Remembering
18	**Bring** out the IOT enabling technologies.	BTL 2	Understanding
19	**Summarize** the difference between IOT and M2M	BTL 5	Evaluating
20	**Generalize** the diagrammatic representation SDN architecture..	BTL 6	Creating
	PART-B		
1	i) **Explain** in detail about IoT levels. and deployment templates(6) ii) **Explain** the significance of each level in detail. (7)	BTL 1	Remembering
2	i)Explain physical design in detail with an example (6) ii) Explain the IoT protocols with block diagram (7)	BTL 2	Understanding
3	i)Write about the IoT enabling technologies (7) ii)Explain the Categories of enabling technologies in detail (6)	BTL 3	Applying
4	Explain in Logical design of IOT? Illustrate with diagram.(13)	BTL 1	Remembering
5	**Analyze** in Deployment templates in detail (13)	BTL 4	Analyzing
6	**Explain** Domain specific IoT with an example (13)	BTL 5	Evaluating
7	**Generalize** the IoT communication APIs i) REST –based communication APIs(7) ii) WebSocket-based Communication APIs(6)	BTL 6	Creating
8	Explain in detail about M2M (13)	BTL 2	Understanding
9	i) **Explain** the application of M2M (3) **ii)** Differentiate M2M and IOT.(10)	BTL 4	Analyzing
10	**i)Demonstrate** in detail about software defined Networking.(7) ii)**Illustrate** in detail about the architecture of SDN (6)	BTL 1	Remembering

11	**Describe** the link layer. (7) Explain in detail about the Transport layer. (6)	BTL 1	Remembering
12	**Illustrate** with a neat sketch, about the architecture of NFV (13)	BTL 3	Applying
13	**Brief** the IoT platform design Methodology in detail (13)	BTL 4	Analyzing
14	**Describe** in detail IOT communications models. (13)	BTL 2	Understanding
	PART-C		
1	**Explain** i) Characteristics of IOT (7) ii) wireless sensor networks(8)	BTL 5	Evaluating
2	Generalize on Big data analytics and embedded systems. (15)	BTL 6	Creating
3	**Explain** in detail about the applications of IOT.(15)	BTL 5	Evaluating
4	**Elaborate** the following. i)role of coordinator in wireless sensor network (8) ii) role of coordinator in an Iot system.(7)	BTL 6	Creating

UNIT II - CHALLENGES AND DOMAIN SPECIFIC APPLICATIONS IN IOT			
Design challenges, Development challenges, Security challenges, Other challenges- Home automation, Industry applications, Surveillance applications.			
PART – A			
Q. No	**Questions**	**BT Level**	**Competence**
1	**Define** Scalability	BTL 1	Remembering
2	**Illustrate the** Three categories of IoT risks	BTL 3	Applying
3	**List** the Attack Categorization For IoT Process Phases	BTL 1	Remembering
4	**Summarize** Connectivity.	BTL 2	Understanding
5	**Classify** the perception layer in IoT.	BTL 3	Applying
6	**Explain** Security in NB-IoT and LTE-M	BTL 6	Creating

7	**Compare** object abstraction with data abstraction.	BTL 5	Evaluating
8	**Analyze** IoT Security Threats and Attacks	BTL 4	Analyzing
9	**What** is the purpose of business layer?	BTL 2	Understanding
10	**List the** Attack Categorization According to IoT Architecture	BTL 1	Remembering
11	**Differentiate** BLE and RFID	BTL 2	Understanding
12	**What** do you mean by functional model of IOT?	BTL 2	Understanding
13	**Define** Zigbee Security.	BTL 1	Remembering
14	**Point out** main security requirements in IoT scenarios	BTL 4	Analyzing
15	**Deduce why RFID Securityis needed?**	BTL 5	Evaluating
16	**Define** Communication model.	BTL 1	Remembering
17	**Name** the Security in LPWAN.	BTL 1	Remembering
18	**Illustrate** few examples on home automation	BTL 3	Applying
19	**Analyze** various types of communication technologies.	BTL 4	Analyzing
20	**Formulate** the features Security in NFC.	BTL 6	Creating
	PART-B		
1	**Describe the** Security Role in the IoT Development. (13)	BTL 1	Remembering
2	**Write in detail about the** IoT Architecture.. (13)	BTL 2	Understanding
3	**Explain** the IOT component in detail. (13)	BTL 3	Applying
4	i) **Analyze** the security challenges. (6) ii) **Explain** the security risks. (7)	BTL 4	Analyzing
5	**Describe** the (i) Zigbee Security (6) (ii) RFID Securityis (7)	BTL 1	Remembering
6	**Examine** the hardware's needed for preventing intrusions insmart Appliances.	BTL 3	Applying

7	i) **Discuss** Intrusion Detection. (6) ii) **Explain** Smoke Detectors**.**(7)	BTL 5	Evaluating
8	**Explain** in detail about the security threats and attacks.s13)	BTL 6	Creating
9	**Describe** Attack Categorization For IoT Process Phases.(13)	BTL 1	Remembering
10	**What** are the IoT Security Requirements? Discuss in detail(13)	BTL 4	Analyzing
11	i) **Tabulate the** Attack Categorization According to IoT Architecture (7) ii) **Examine** the Security Threats at the Sensing/Perception Layer. (6)	BTL 1	Remembering
12	i) **Express** how the Security Threats the Network and Service Support Layers. (7) ii) Discuss Data Confidentiality in IoT. (6)	BTL 2	Understanding
13	**What** is Trust and Security from a Device Perspective**.**(13)	BTL 4	Analyzing
14	**Discuss** in detail privacy in IOT. (13)	BTL 2	Understanding
	PART-C		
1	**Discuss** in detail about how the IOT is applied in various applications. (15)	BTL 6	Creating
2	**Evaluate** the strategic to follow in the implementation of the following using IoT techniques i)Smart Environment (7) ii) Surveillance (8)	BTL 5	Evaluating
3	**Formulate** how IoT is implemented in (15) (i)Machine Diagnosis (ii)Indoor Air quality Monitoring	BTL 6	Creating
4	**Evaluate** Security in IoT Networks.(15)	BTL 5	Evaluating

UNIT III – IoT PROTOCOLS

Protocol Standardization for IoT – Efforts – M2M and WSN Protocols – SCADA and RFID Protocols – Unified Data Standards – Protocols – IEEE 802.15.4 – BACNet Protocol – Modbus– Zigbee Architecture – CoAP - Security			
PART – A			
Q. No	**Questions**	**BT Level**	**Competence**
1	**Define** IoT standardization.	BTL 1	Remembering
2	**Distinguish** between identification and discovery in IoT protocol stack.	BTL 2	Understanding
3	**Mention** data protocols.	BTL 1	Remembering
4	**Define** Multilayer framework.	BTL 1	Remembering
5	**Summarize** the salient features of M2M protocol**.**	BTL 6	Creating
6	**Show** the difference of M2M and WSN protocols.	BTL 3	Applying
7	**List** the requirements of RFID protocols in IoT?	BTL 2	Understanding
8	**Why** do we need a SCADA protocol?	BTL 4	Analyzing
9	**How** does the data acquisition works in SCADA?	BTL 5	Evaluating
10	**Compare** standardization with innovation in IoT.	BTL 4	Analyzing
11	**Demonstrate** the issues with IoT standardization.	BTL 3	Applying
12	**Discuss** the unified data standards.	BTL 2	Understanding
13	**List** the sensor standards in unified data standards.	BTL 1	Remembering
14	**Give** the low-rate wireless personal area networks (LR-WPANs).	BTL 1	Remembering
15	**Describe** the convergence sub layer.	BTL 2	Understanding
16	**How** the BACNet protocol works?	BTL 3	Applying
17	**Formulate** the features of Modbus and give the object types.	BTL 6	Creating
18	**Where** zigbee is used and point the zigbee addressing mode?	BTL 1	Remembering
19	**Discuss** what COAP is.	BTL 5	Evaluating

20	**Why** do we need IoT security?	BTL 4	Analyzing
	PART-B		
1	**List** the Protocol standardization of IoT and give the current status of standardization.(13)	BTL 1	Remembering
2	**Analyze** the uses of i) M2M and WSN protocols. (4) ii) SCADA protocols. (4) iii) RFID protocols. (5)	BTL 4	Analyzing
3	**Describe** the architecture of SCADA and RFID Protocols in detail.What does the IEEE standard explained about? (13)	BTL 2	Understanding
4	i) **List** the advantages and disadvantages of Unified data standards. (6) ii) **Identify** the uses of machine generated data. (7)	BTL 1	Remembering
5	i) **Summarize** the IoT protocols-IEEE 802.15.4(6) ii) **Describe** the layered approach of LR-WPANs. (7)	BTL 2	Understanding
6	**Give** the importance of BACNet protocol in detail(13)	BTL 6	Creating
7	i) **Illustrate** in detail about the Modbus. (6) ii) **Examine** in detail protocol version of Modbus.(7)	BTL 3	Applying
8	i) **Point** out the importance of Zigbee.(6) ii) **Explain** in detail about the architecture of Zigbee. (7)	BTL 4	Analyzing
9	**What** is IoT security? **Describe** the challenges of that in detail**.**(13)	BTL 1	Remembering
10	i) **Differentiate** WSN PROTOCOL AND m2M PROTOCOL. (7) ii) **Discuss** vulnerabilities of IoT. (6)	BTL 2	Understanding
11	**Illustrate** the security requirements of IoT in detail. (13)	BTL 3	Applying
12	i) **Explain** the security architecture of IoT (6) ii) **Analyze** the Threat modeling and analysis in detail. (7)	BTL 4	Analyzing
13	**Explain** in detail about IoT security tomography(13)	BTL 5	Evaluating

14	**What** do you mean by use cases and misuse cases.(13)	BTL 1	Remembering
	PART-C		
1	**Compare** how the zigbee is used in home automation and medical device data collection. (15)	BTL 5	Evaluating
2	**Discuss** the need of IoT security management system.(15)	BTL 6	Creating
3	**Evaluate** and contrast the merits and demerit of Modbus in real time system with examples.(15)	BTL 5	Evaluating
4	**Test** the significant benefit of using the following service in IoT i) DoS attack. (5) ii) Theft of Resources. (5) iii) Information Disclosure. (5)	BTL 6	Creating

UNIT-IV BUILDING IoT WITH RASPBERRY PI & ARDUINO			
Building IOT with RASPERRY PI- IoT Systems - Logical Design using Python – IoT Physical Devices & Endpoints - IoT Device -Building blocks -Raspberry Pi -Board - Linux on Raspberry Pi - Raspberry Pi Interfaces.			
PART-A			
Q. No	**Questions**	**BT Level**	**Competence**
1	**Analyze** on features of Raspberry PI.	BTL 4	Analyzing
2	**Define** Raspberry PI.	BTL 1	Remembering
3	**Examine** how the system on chip.	BTL 3	Applying
4	**Summarize** the benefits of SoC.	BTL 2	Understanding
5	**List** out the steps used in internet gateway device.	BTL 1	Remembering
6	**Write** the significant of IoT systems.	BTL 6	Creating
7	**Define** Logical design using python.	BTL 1	Remembering
8	**Analyze** how complex is the logical design with Python for an application**?**.	BTL 4	Analyzing
9	**Illustrate** the building blocks of IoT device.	BTL 3	Applying

10	**Name** any four services offered by Raspberry Pi.	BTL 1	Remembering
11	**Justify** how a linux Os is useful in IoT.	BTL 5	Evaluating
12	**Differentiate** Raspberry with Arduino.	BTL 2	Understanding
13	**What** are the interfaces in Raspberry?	BTL 2	Understanding
14	**Name** the different IoT platforms.	BTL 6	Creating
15	**Analyze** how programming raspberry pi works.	BTL 4	Analyzing
16	**Define** Arduino and write the feature of Arduino.	BTL 1	Remembering
17	**Generalize** as to how Arduino works.	BTL 6	Creating
18	**What** is the purpose of actuators in IoT?	BTL 2	Understanding
19	**Name** the Need For sensors in IoT.	BTL 1	Remembering
20	**Demonstrate** Event –driven industrial IoT systems?	BTL 3	Applying
	PART-B		
1	**Describe** the procedure of Building IOT with RASPERRY PI. What are the physical devices and end points? (13)	BTL 1	Remembering
2	i) **List** the features in IoT systems (7) ii) **Describe** Logical design using python in detail. (6)	BTL 1	Remembering
3	i) **Summarize** the IoT physical Devices in detail. (6) ii) **Discuss** on Endpoints in IoT. (7)	BTL 2	Understanding
4	**Draw** and **explain** the building blocks of IoT device (13)	BTL 3	Applying
5	i) **Explain** the concepts involved in Raspberry Pi. (7) ii) **Classify** the operating systems used for raspberry pi. (6)	BTL 4	Analyzing
6	**Evaluate** the Raspberry Pi board in detail with neat sketch. (13)	BTL 5	Evaluating
7	i) **Generalize** the Linux on Raspberry Pi. (6) ii) **Design** the functional building blocks in Raspberry Pi Interfaces. (7)	BTL 6	Creating

8	**What** is Analog discovery? **Describe** in detail about how it interconnect and interface with logic gates with a suitable diagram**.** (13)	BTL 1	Remembering
9	**Discuss** contrast scripting and compiled programming languages and their applications to the raspberry Pi.(13)	BTL 2	Understanding
10	i) **Classify** the various types of programming languages for raspberry.(6) ii) **Show** how will it is used in IoT.(7)	BTL 3	Applying
11	**Illustrate** Programming Raspberry Pi with Python with examples.(13)	BTL 4	Analyzing
12	**Examine** the other IoT platforms of IoT. (13)	BTL 1	Remembering
13	**Discuss** in detail about Arduino with neat sketch. (13)	BTL 2	Understanding
14	**Give** a detailed note on Advantage of Arduino in building the IoT systems.	BTL 4	Analyzing
	PART-C		
1	**Evaluate** the performance of Raspberry Pi with suitable illustrations. Illustrate the design issues for Raspberry Pi interfaces.(15)	BTL 5	Evaluating
2	**Formulate** the significant use of Raspberry Pi i) Smart cities. (8) ii) Industrial appliances. (7)	BTL 6	Creating
3	**Choose** any one IoT Platforms and List its benefits with examples. (15)	BTL 5	Creating
4	**Construct** the Design of Smart home with Raspberry Pi and other hardware devices with neat sketch.	BTL 6	Creating

UNIT V – DEVELOPING IOT PROGRAMS			
Introduction to Python, Introduction to different IoT tools, Developing applications through IoT tools, Developing sensor based application through embedded system platform, Implementing IoT concepts with python			
PART-A			
Q. No	**Questions**	**BT Level**	**Competence**
1	**Give** the characteristics of python?	BTL 2	Understanding
2	**Define** Chef.	BTL 1	Remembering
3	**Summarize** the several key tools for building applications.	BTL 2	Understanding

4	**List** the chef framework..	BTL 1	Remembering
5	**Illustrate** the diagram for setting up three-tier deployment with chef	BTL 3	Applying
6	**Summarize** Hadoop cluster.	BTL 5	Evaluating
7	**Define** Thingworx	BTL 1	Remembering
8	**Write about storm cluster.**	BTL 6	Creating
9	**Identify** the need of NETCONF tool.	BTL 2	Understanding
10	**Differentiate** NETCONF and YANG**.**	BTL 4	Analyzing
11	**Write** a brief note on SecuRemote.	BTL 6	Creating
12	**Mention** how Smart irrigation is managed with NETCONF-	BTL 5	Evaluating
13	**Illustrate** IOT Solution Development Kit.	BTL 3	Applying
14	**Discuss** about Puppet tool	BTL 2	Understanding
15	**Tabulate** the various tools in IOT.	BTL 1	Remembering
16	**Compare** Puppet and Chef tool.	BTL 4	Analyzing
17	**Show** the deployment model for Puppet..	BTL 3	Applying
18	**Discuss** the commands to install and run VNC server on Raspberry pi.	BTL 1	Remembering
19	**List** the steps for IOt device Management with NETCONF-YANG .	BTL 1	Remembering
20	**Point** the steps to install and run VNC server on Raspberry pi.	BTL 4	Analyzing
PART-B			
1	**Examine** in detail the following (i)Chef tool.(7) (ii)Setting up chef tool.(6)	BTL 3	Applying
2	i) **Define** Multi-tier Application Deployment with chef. ii) **Discuss** in detail about Applications of IoT.(7)	BTL 1	Remembering
3	**Explain** the installation of python(13)	BTL 1	Remembering

4	i) **Demonstrate** with a neat diagram the setting up a Hadoop Cluster.(6) ii) **Demonstrate** the chef recipe for setting up hosts.(7)	BTL 3	Applying
5	i) **Analyze the** setting up an Apache Storm Cluster with Chef(7) ii) **Explain** setting up Zookeeper..(6)	BTL 4	Analyzing
6	(i)**Describe** the key concept of Puppet (ii)Describe the setting up puppet server and client(13)	BTL 4	Analyzing
7	i) **Compose** in detail about SecuRemote Cloud Services.(6) ii) **Generalize** Iot Solution Development Kit.(7)	BTL 6	Creating
8	**Evaluate** the concepts involved in Software Tools of IoT.(13)	BTL 5	Evaluating
9	**Express** in detail about the need of IoT management tools.(13)	BTL 2	Understanding
10	i) **Summarize** on the basic concepts of Multi-tier Deploymant.(6) ii) **Evaluate how** to create the haproxy class which contains a package resource for installing haproxy.(7)	BTL 2	Understanding
11	**Describe** in detail about the NETCONF-YANG . (13)	BTL 1	Remembering
12	i) **Analyze** in detail the strps for IOt device Management with NETCONF-YANG ..(6) ii) **Compare** the various tools in IoT.(7)	BTL 4	Analyzing
13	**Describe** how smart Irrigation IoT System with NETCONF-YANG (13)	BTL 1	Remembering
14	**Write** detailed note on Managing Home Intrusion Detection IoT with NETCONF-YANG (13)	BTL 2	Understanding
	PART-C		
1	**Summarize** BLE/ANT Certified Modules. (15)	BTL 5	Evaluating
2	**(i)Discuss** the Smart Appcessory Devices and Beacons (ii)SecuRemote IoT Evaluation Kit.	BTL 6	Creating
3	**Formulate how to** Implement IoT with python with python (15)	BTL6	Creating
4	**Evaluate** and **summarize** in detail Wireless Module Developers Kit.(15)	BTL 5	Evaluating