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# B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

## August 2024 Semester End Main Examinations

**Programme: B.E.**

**Semester: IV**

**Branch: CSE (IoT & Cyber Security Including Blockchain)**

**Duration: 3 hrs.**

**Course Code: 23IC4PCIOT**

**Max Marks: 100**

**Course: Internet of Things**

**Instructions:** 1. Answer any FIVE full questions, choosing one full question from each unit.  
2. Missing data, if any, may be suitably assumed.

<b>UNIT - I</b>			<b>CO</b>	<b>PO</b>	<b>Marks</b>
1	a)	With a neat diagram explain IoT reference model published by the IoT World Forum.	<i>CO3</i>	<i>PO3</i>	<b>10</b>
	b)	Describe the IoT data management and compute stack.	<i>CO3</i>	<i>PO3</i>	<b>10</b>
<b>UNIT - II</b>					
2	a)	Illustrate about LoRaWAN architecture and security with necessary diagrams.	<i>CO3</i>	<i>PO2</i>	<b>10</b>
	b)	With neat diagrams explain Bluetooth frame structure and Bluetooth Protocol Stack.	<i>CO3</i>	<i>PO3</i>	<b>10</b>
<b>OR</b>					
3	a)	With neat diagram, explain the working of I2C Communication Protocol	<i>CO1</i>	<i>PO2</i>	<b>06</b>
	b)	Explain the working of master and slave components in SPI communication	<i>CO1</i>	<i>PO2</i>	<b>06</b>
	c)	With appropriate diagrams, explain PHY and MAC format for IEEE 802.15.4 device types.	<i>CO3</i>	<i>PO2</i>	<b>08</b>
<b>UNIT - III</b>					
4	a)	Elaborate the optimizing IP for IoT from 6LoWPAN to 6Lo	<i>CO2</i>	<i>PO3</i>	<b>10</b>
	b)	Describe 6TiSCH along with the four schedule management mechanisms and forwarding models.	<i>CO2</i>	<i>PO3</i>	<b>10</b>
<b>OR</b>					
5	a)	Describe CoAP protocol with its message format and find out the differences between CoAP and MQTT protocol.	<i>CO1</i>	<i>PO2</i>	<b>10</b>
	b)	Discuss the device discovery functionality in Intel IOTivity.	<i>CO2</i>	<i>PO3</i>	<b>10</b>

**Important Note:** Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

<b>UNIT - IV</b>					
6	a)	What is Amazon autoscaling? What are its benefits?	<i>CO2</i>	<i>PO3</i>	<b>05</b>
	b)	Explain the Amazon EMR along with its advantages and disadvantages.	<i>CO2</i>	<i>PO2</i>	<b>05</b>
	c)	With diagram explain SDN architecture. Explain the role and usage of OpenFlow switches and OpenFlow flow tables in this architecture.	<i>CO3</i>	<i>PO3</i>	<b>10</b>
<b>UNIT - V</b>					
7	a)	If some plaintext $m$ is representing a point $M(3,3)$ on an Elliptical curve, $E(F_7)$ , with equation, $y^2 = x^3 + 2x + 4$ . Use Elliptical Curve Cryptographic method to generate the public and private keys using public point $P(2,3)$ . Using these keys find the ciphertext, using the ECC encryption algorithm. Apply ECC decryption algorithm to recover the point $M$ . Given prime number $p=7$ with prime order $n=101$ . Assume $d=99$ and $k=10$ for the computation.	<i>CO1</i>	<i>PO2</i>	<b>10</b>
	b)	Illustrate the three-layer IoT architecture and security issues in each layer.	<i>CO3</i>	<i>PO3</i>	<b>10</b>

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