Reg. No.															

Question Paper Code	14019

B.E. / B.Tech - DEGREE EXAMINATIONS, NOV / DEC 2025

Fifth Semester

Computer Science and Engineering (IoT)

20CIPC501- IoT ARCHITECTURE AND PROGRAMMING IN IoT

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	In IoT-enabled smart cities, which business process is significantly improved? a) Increased traffic congestion b) Real-time traffic management c) Manual data collection d) Centralized data storage	1	K1	CO1
2.	The primary goal of data management in IoT is to handle the large ____ of data generated by devices. a) volume b) latency c) encryption d) processing	1	K1	CO1
3.	A healthcare provider needs a standardized way to manage and exchange data between various medical IoT devices Which standard should they adopt? a) HTTP b) oneM2M c) FTP d) SMTP	1	K1	CO2
4.	In IoT, what does the term "end-to-end security" refer to? a) Security measures applied only at the endpoints b) Security measures applied only during data transmission c) Comprehensive security measures applied throughout the data lifecycle d) Security measures applied only during data storage	1	K1	CO2
5.	----------is an open-source IoT data platform that helps you build innovative and scalable IoT/M2M solutions. a) Device-hive b) Main flux c) Thingerio d) All of the above	1	K1	CO3
6.	Which method is best to Choose a secure framework will ensure that your confidential or third-party data and information is safe and secure? a) IoT platform with breach b) Secure IoT Network c) Intruder based IoT Network d) Man in the middle IoT Network	1	K1	CO3
7.	----------is a family of microchip's modules used for wireless communication. a) XBEE b) Zigbee c) Bluetooth d) Meshbee	1	K1	CO4
8.	Raspberry pi uses -------- software. a) Raspbian OS b) X-CTU c) Digi d) None of the above	1	K1	CO4
9.	In the ESP8266 project for LED blinking, what is the purpose of the "host" variable in the code? a) Define the type of network to connect b) Specify the Wi-Fi network settings c) Determine the website to grab content from d) Indicate the data transfer protocol	1	K1	CO5
10.	In the ESP8266 code provided, what do you need to do to switch the LED off?	1	K1	CO6

```
// Import required libraries
#include <ESP8266WiFi.h>

void setup() {

// Set GPIO 5 as output
pinMode(5, OUTPUT);
```

```
// Set GPIO 5 on a HIGH state
digitalWrite(5, HIGH);

}
void loop() {

}
```

a) Use digitalWrite(5, HIGH) b) Remove the power supply
c) Use digitalWrite(5, LOW) d) Increase the voltage to 5V

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11.	Compare polymorphic and Proprietary data.	*2*	*K2*	*CO1*
12.	Explain the necessity of including both conceptual elements and actual elements in architectural design.	*2*	*K2*	*CO1*
13.	Why IoT requires interaction between humans, machines and the physical environment?	*2*	*K1*	*CO2*
14.	Describe the IoT-A functional model with suitable diagram.	*2*	*K2*	*CO2*
15.	Differentiate between EEPROM and Flash Memory based on their structure, operation, and applications.	*2*	*K2*	*CO3*
16.	How floating-point arithmetic can be efficiently designed and handled in embedded or IoT systems?	*2*	*K1*	*CO3*
17.	List the need of using XBEE module in IOT.	*2*	*K1*	*CO4*
18.	How AT commands are used to configure the XBee module and manage communication? Give suitable examples.	*2*	*K1*	*CO4*
19.	Illustrate on the need for a breadboard in circuit wiring .	*2*	*K2*	*CO5*
20.	What is the role of capacitors and resistors in providing circuit stabilization?	*2*	*K1*	*CO5*
21.	Show a suitable method to control a Tri-color LED using PWM (Pulse Width Modulation) with an appropriate code example.	*2*	*K2*	*CO6*
22.	How to check the Wi-Fi status in an IoT device and provide a sample code for it?	*2*	*K1*	*CO6*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Summarize the reference architecture provides layers and functions for building IoT and M2M-based system solutions.	*11*	*K2*	*CO1*
		OR			
	b)	Interpret cloud deployment models that standardize the Internet of Things Technology.	*11*	*K2*	*CO1*
24.	a)	Illustrate the Functional Groups (FG) and their interaction with the ARM using a suitable model.	*11*	*K2*	*CO2*
		OR			
	b)	Consider the following: The case that an HTTP Client sends an HTTP request to a CoAP server through a Gateway Device hosting an HTTP-CoAP Cross Proxy Explain the possible configurations and IETF core proxy.	*11*	*K2*	*CO2*
25.	a)	Explain the importance of GNU licensing and linux platform.	*11*	*K2*	*CO3*
		OR			
	b)	Explain the procedure how to select OS for Internet of Things Illustrate the importance and Features of selecting OS.	*11*	*K2*	*CO3*

26.	a)	Illustrate the process which is used for loading firmware onto an XBEE module, and how does it enhance its capabilities.	*11*	*K2*	*CO4*
		OR			
	b)	Explain how can you set up a Raspberry Pi as a data collector for XBEE sensor nodes, enabling it to host and process data from various sensors?	*11*	*K2*	*CO4*
27.	a)	Describe the need for ESP8266 and outline its software requirements with suitable explanations.	*11*	*K2*	*CO5*
		OR			
	b)	Illustrate with a suitable code for the statement Under robotics/IoT domain, controlling a servo motor with an ESP8266 or ESP32.	*11*	*K2*	*CO5*
28.	a)	Develop a program to control a tri-color LED using PWM (Pulse Width Modulation), enabling color mixing and brightness adjustment for each channel.	*11*	*K3*	*CO6*
		OR			
	b)	Develop a program and design the circuit setup required for wiring and controlling a servo motor.	*11*	*K3*	*CO6*