A9.4-R5.1 Internet of Things (IoT): A Practical Approach

DURATION : 03 Hours   **MAXIMUM MARKS : 100**

OMR Sheet No. : ☐☐☐☐☐

Roll No. : ☐☐☐☐☐☐   **Answer Sheet No. :** ☐☐☐☐☐☐

Name of Candidate : _____ ; **Signature of Candidate :** _____

INSTRUCTIONS FOR CANDIDATES :

- Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet.

- Question Paper is in English language. Candidate has to answer in English language only.

- There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.

- **PART ONE** is Objective type and carries **40** Marks. **PART TWO** is Subjective type and carries **60** Marks.

- **PART ONE** is to be answered in the **OMR ANSWER SHEET** only, supplied with the question paper, as per the instructions contained therein. **PART ONE** is **NOT** to be answered in the answer book for **PART TWO**.

- Maximum time allotted for **PART ONE** is **ONE HOUR**. Answer book for **PART TWO** will be supplied at the table when the Answer Sheet for **PART ONE** is returned. However, Candidates who complete **PART ONE** earlier than one hour, can collect the answer book for **PART TWO** immediately after handing over the Answer Sheet for **PART ONE** to the Invigilator.

- **Candidate cannot leave the examination hall/room without signing on the attendance sheet and handing over his/her Answer Sheet to the invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.**

- After receiving the instruction to open the booklet and before answering the questions, the candidate should ensure that the Question Booklet is complete in all respects.

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

PART - ONE

(Answer all the questions. Each question carries ONE mark)

1. **Each question below gives a multiple choice of answers. Choose the most appropriate one and enter in the "OMR" answer sheet supplied with the question paper, following instructions therein.** **(1x10)**

1.1 Which of the following is not an IoT device ?
   (A) Smartphones
   (B) Smart TV
   (C) Smart Refrigerator
   (D) Personal Computer

1.2 Which protocol is used for communication between IoT devices ?
   (A) HTTP
   (B) FTP
   (C) MQTT
   (D) TCP/IP

1.3 Which of the following is an example of an industrial IoT application ?
   (A) Smart Home Automation
   (B) Fitness Tracker
   (C) Smart Lighting System
   (D) Predictive Maintenance

1.4 Which of the following is not a wireless IoT communication protocol ?
   (A) Wi-Fi
   (B) Bluetooth
   (C) NFC
   (D) Ethernet

1.5 Which of the following is a potential future application of IoT ?
   (A) Autonomous vehicles
   (B) Smart homes
   (C) Healthcare monitoring
   (D) All of the above

1.6 Which of the following computing does not depend on multimedia computing in IOT ?
   (A) Client server computing
   (B) Fog/Edge computing
   (C) Software Defined networks for M-IOT computing
   (D) cloud computing

1.7 What do you mean by micro in microcontroller ?
   (A) Distance between 2 IC's
   (B) Distance between 2 transistors
   (C) Size of a controller
   (D) Distance between 2 pins

1.8 IPV6 addresses is _____.
   (A) 64-bit
   (B) 128-bit
   (C) 256-bit
   (D) 512-bit

1.9 Which programming language is used by Arduino IDE IoT software for writing codes ?
   (A) Python
   (B) Java
   (C) C/C++
   (D) JavaScript

1.10 Arduino IDE consists of 2 functions. What are they ?
   (A) Build () and loop ()
   (B) Setup () and build()
   (C) Setup () and loop ()
   (D) Loop () and build() and setup()

2. **Each statement below is either TRUE or FALSE. Choose the most appropriate one and enter your choice in the "OMR" answer sheet supplied with the question paper, following instructions therein.** **(1x10)**

2.1 Geolocation software is used by host.

2.2 NoSQL is non-relational data base

2.3 InfluxDB is used for timeseries data collection based on their data model.

2.4 RMI uses stub and skeleton for communication with the remote object.

2.5 RFID is a part of IoT.

2.6 Wi-Fi stands for Wide Fidelity.

2.7 Kevin Ashton is The Father of IoT.

2.8 Raspberry Pi need External Hardware.

2.9 Four USB ports are present in Raspberry Pi 3.

2.10 Arduino provides IDE Environment.

3. **Match words and phrases in column X with the closest related meaning / words(s) / phrase(s) in column Y. Enter your selection in the "OMR" answer sheet supplied with the question paper, following instructions therein.**

(1x10)

	X		Y
3.1	Sensors	**A.**	Analytical tools that improve the ability to describe phenomena.
3.2	Augmented intelligence	**B.**	MQ 9
3.3	Standards	**C.**	MQ Series Sensor
3.4	Raspberry Pi 3 Model B	**D.**	5 Kilometer
3.5	Gas Sensor	**E.**	1883
3.6	LoRa WAN	**F.**	both server and client can share resources and communicate with each other directly
3.7	MQTT runs at port no.	**G.**	A device that generates an electronic signal from a physical condition.
3.8	MongoDB	**H.**	LM35 Sensor
3.9	Carbon Monoxide Gastype	**I.**	64-bit quad core ARM Cortex-A53
3.10	peer-to-peer model	**J.**	Commonly accepted prescriptions for action.
		K.	A document-based NoSQL database system
		L.	1683
		M.	3 Kilometer

4. **Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Choose the most appropriate option, enter your choice in the "OMR" answer sheet supplied with the question paper, following instructions therein.** (1x10)

A	sensitivity	B	Presence of nearby objects	C	Nuclear Magnetic Resonance	D	Internet of Things
E	End-End Principle	F	16	G	4	H	Optical Fibre
I	Measure pressure	J	Multiplexer (MUX)	K	Two	L	IPV6 protocol
M	Non Magnetic Resonance						

4.1. _____ is a device that selects between several analog or digital input signals and forwards the selected input to a single output line.

4.2. Inductive sensors are also referred to as "NMR" coils. Where NMR stands for _____.

4.3. Change in output of sensor with change in input is _____.

4.4. Proximity sensors are used to _____.

4.5. IPV6 is _____ byte address.

4.6. There are _____ version/s of IP's.

4.7. Many desktops and operating systems include which _____ protocol.

4.8. The design of the Internet protocol suites adhere to the _____ principle.

4.9. _____ communication technologies has highest data rate.

4.10. Network of connected device is called _____.

PART - TWO

(Answer any FOUR questions)

5. (a) What are the 4 key pillars of IOT ? Explain

    (b) What are the 4 stages of IOT architecture ?

    (c) List any 5 examples of IOT devices & its application.

    (5+5+5)

6. (a) Explain the pinout diagram of NodeMCU.

    (b) Explain the pros and cons of NodeMCU.

    (c) What is the role of AI in improving and securing IoT ecosystem ?

    (5+5+5)

7. (a) Write a procedure to fade an LED in Arduino IDE to program NodeMCU/ ESP8266.

    (b) Write a procedure to blink an LED in Arduino IDE to program NodeMCU/ ESP8266.

    (c) Write steps required for enabling Arduino IDE to program Node MCU/ ESP8266.

    (5+5+5)

8. Write short note on the following :

    (a) MQTT

    (b) LoRA

    (c) Role of IPV6 in IoT

    (5+5+5)

9. Write short note on the following :

    (a) cloud computing

    (b) ThingSpeak

    (c) Security threats in IoT

    (5+5+5)

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