Sl. No.

A9.4-R5 : INTERNET OF THINGS : A PRACTICAL APPROACH

अवधि : 03 घंटे **अधिकतम अंक : 100**
DURATION : 03 Hours **MAXIMUM MARKS : 100**

ओएमआर शीट सं. : **OMR Sheet No. :**					

रोल नं. : **Roll No. :**

उत्तर-पुस्तिका सं. : **Answer Sheet No. :**

परीक्षार्थी का नाम : **परीक्षार्थी के हस्ताक्षर :**
Name of Candidate : _____ **Signature of Candidate :** _____

परीक्षार्थियों के लिए निर्देश :	**Instructions for Candidate :**
कृपया प्रश्न-पुस्तिका, ओएमआर शीट एवं उत्तर-पुस्तिका में दिये गए निर्देशों को ध्यानपूर्वक पढ़ें।	Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet.
प्रश्न-पुस्तिका की भाषा अंग्रेजी है। परीक्षार्थी केवल अंग्रेजी भाषा में ही उत्तर दे सकता है।	Question Paper is in English language. Candidate can answer in English language only.
इस मॉड्यूल/पेपर के **दो भाग** हैं। **भाग एक** में **चार** प्रश्न और **भाग दो** में **पाँच** प्रश्न हैं।	There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.
भाग एक ''वैकल्पिक'' प्रकार का है जिसके कुल अंक 40 है तथा **भाग दो** ''व्यक्तिपरक'' प्रकार का है और इसके कुल अंक 60 है।	**PART ONE** is Objective type and carries 40 Marks. **PART TWO** is Subjective type and carries 60 Marks.
भाग एक के उत्तर, **ओएमआर उत्तर-पुस्तिका** पर ही दिये जाने हैं। **भाग दो** की उत्तर-पुस्तिका में **भाग एक** के उत्तर **नहीं** दिये जाने चाहिए।	**PART ONE** is to be answered in the **OMR ANSWER SHEET** only. **PART ONE** is **NOT** to be answered in the answer book for **PART TWO**.
भाग एक के लिए अधिकतम समय सीमा **एक घण्टा** निर्धारित की गई है। **भाग दो** की उत्तर-पुस्तिका, **भाग एक** की उत्तर-पुस्तिका जमा कराने के पश्चात् दी जाएगी। तथापि, निर्धारित एक घंटे से पहले **भाग एक** पूरा करने वाले परीक्षार्थी **भाग एक** की उत्तर-पुस्तिका निरीक्षक को सौंपने के तुरंत बाद, **भाग दो** की उत्तर-पुस्तिका ले सकते हैं।	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.
परीक्षार्थी, उपस्थिति-पत्रिका पर हस्ताक्षर किए बिना और अपनी उत्तर-पुस्तिका, निरीक्षक को सौंपे बिना, परीक्षा हॉल/कमरा नहीं छोड़ सकते हैं। ऐसा नहीं करने पर, परीक्षार्थी को इस मॉड्यूल/पेपर में अयोग्य घोषित कर दिया जाएगा।	**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.**
प्रश्न-पुस्तिका को खोलने के निर्देश मिलने के पश्चात् एवं उत्तर लिखना आरम्भ करने से पहले उम्मीदवार जाँच कर यह सुनिश्चित कर लें कि प्रश्न-पुस्तिका प्रत्येक दृष्टि से संपूर्ण है।	After receiving the instruction to open the booklet and before starting to answer the questions, the candidate should ensure that the Question Booklet is complete in all respect.

जब तक आपसे कहा न जाए, तब तक प्रश्न-पुस्तिका न खोलें।
DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

PART ONE

(Answer all the questions)

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 ESP8266 works on :

(A) 3.3 V

(B) 4.3 V

(C) 6 V

(D) 5.3 V

1.2 How many types of Arduinos do we have ?

(A) 4

(B) 6

(C) 8

(D) 9

1.3 Which Microcontroller is used in ArduinoUNO ?

(A) ATmega328p

(B) ATmega2560

(C) ATmega32114

(D) AT91SAM3x8E

1.4 Standard port number for secure MQTT is :

(A) 1883

(B) 8100

(C) 8873

(D) 8883

1.5 What is the size of packet in IPv6 Addressing Scheme ?

(A) 32 bits

(B) 64 bits

(C) 128 bits

(D) 48 bits

1.6 Which one out of these is not a data link layer technology ?

(A) Bluetooth

(B) UART

(C) Wi-Fi

(D) TELNET

1.7 The sensors are classified on the basis of :

(A) Functions

(B) Performance

(C) Output

(D) All of the above

1.8 IaaS stands for _____.

(A) Infrastructure as a Service

(B) Infrastructure as a Software

(C) Internet as a Service

(D) Internet as a Software

1.9 MySQL is used to create :

(A) Database

(B) Signal

(C) Data

(D) None of the above

1.10 Supports connectivity over Internet/ Private network (WAN) :

(A) Public cloud

(B) Private cloud

(C) Both (A) and (B)

(D) None of the above

SPACE FOR ROUGH WORK

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

2.1 Arduino provide IDE Environment.

2.2 Stability is the ability of the sensor to indicate the same output over a period of time for a constant input.

2.3 Mechanical actuators function through converting rotary motion to non-linear motion.

2.4 I2C cannot provide good support to the slow devices.

2.5 CoAP is a specialized web transfer protocol for use with constrained nodes and constrained networks in the Internet of Things.

2.6 Thing Speak cannot used in the creation of sensor logging applications and location tracking applications.

2.7 Account Enumeration describes an application that, in response to a failed authentication attempt, returns a response indicating whether the authentication failed due to an incorrect account identifier or an incorrect password.

2.8 Connection less communication follows TCP Protocol.

2.9 Apache is a cross platform web server.

2.10 Zigbee is a communication standard that comes under ISM band.

3. **Match words and phrases in column X with the closest related meaning/ word(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	Logical address	**A.**	Sensor
3.2	MQTT	**B.**	NodeMCU
3.3	Automatic Data Collector	**C.**	Message Queuing Telemetry Transport
3.4	Is a Microcontroller	**D.**	MAC
3.5	Pneumatics	**E.**	Constrained device Socket
3.6	Two-way communication between the servers and the clients	**F.**	Thing Speak
3.7	Service Provided by cloud to IoT	**G.**	Sourcing
3.8	Web based cloud that provide services to IoT system	**H.**	CSSS
3.9	A device with limited resources called as	**I.**	Actor
3.10	Markup language for webpage	**J.**	Actuator
		K.	HTML
		L.	Message Queuing Telemetry Transducer
		M.	IPv4

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

A.	Wireless fidelity	**B.**	NoSQL	**C.**	SPI
D.	analog	**E.**	open source	**F.**	Transport
G.	Application	**H.**	digital	**I.**	MQTT
J.	cloud	**K.**	IoT Platform	**L.**	CoAP
M.	Industrial Internet				

4.1 Environmental measurable parameter is in _____ form, like temperature, sound and pressure.

4.2 SD card module uses _____ protocol to communicate with microcontrollers.

4.3 The Arduino IDE is published as _____ tools.

4.4 Telnet is a _____ layer protocol.

4.5 Publisher and subscriber model is used in _____ protocol.

4.6 Wi-Fi stands for _____.

4.7 _____ Database are primarily called as non-relational or distributed database.

4.8 A multi-layer technology which is used to manage and automate the connected devices is known as the _____.

4.9 _____ refers to sharing resources, software and information through a network.

4.10 _____ makes a connected enterprise by merging the information and operational department of the industry.

PART TWO

(Answer any FOUR questions)

5. (a) Connection oriented and connection less are transport layer services. What are the differences between them ?

(b) What is CoAP protocol ? Draw architecture of CoAP protocol. **(8+7)**

6. (a) What are the main issues in implementation of IoT ? Explain account enumeration mechanism to deal with security issue.

(b) What is CSS ? Explain GET and POST Methods.

(c) Differentiate Internet and Intranet. **(7+3+5)**

7. (a) Define the following addresses with respect to internet of things.

1. IPv6

2. IPv4

(b) Explain sensor and actuator with example.

(c) What is the role of analog to digital converter in IoT system ? **(6+4+5)**

8. (a) Write Steps to push data from NodeMCU to thing speak cloud.

(b) Explain and draw architecture of ESP8266. **(7+8)**

9. (a) Explain role of MQTT broker with diagram.

(b) What are the role of private cloud and public cloud in internet of things ?

(c) Write short note on Zigbee. **(5+5+5)**

- o 0 o -

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK