A4-R5 : INTERNET OF THINGS AND ITS APPLICATIONS

अवधि : 03 घंटे
DURATION : 03 Hours

अधिकतम अंक : 100
MAXIMUM MARKS : 100

ओएमआर शीट सं. : OMR Sheet No. :						

रोल नं. : Roll No. : | | | | | | |

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

परीक्षार्थी का नाम :
Name of Candidate : _____

परीक्षार्थी के हस्ताक्षर :
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 MQTT stands for :

(A) Mass Query Telemetry Transport

(B) Message Queuing Telemetry Transport

(C) Message Query Text Transport

(D) Mass Queuing Text Transport

1.2 What is the microcontroller used in Arduino UNO ?

(A) ATmega328p

(B) ATmega2560

(C) ATmega32114

(D) AT91SAM3x8E

1.3 What does GPIO stands for ?

(A) General Purpose Inner Outer Propeller

(B) General Purpose Input Output Pins

(C) General Purpose Interested Old People

(D) General Purpose Input Output Processor

1.4 Which of the following is not a TCP/IP layer ?

(A) Application Layer

(B) Transport Layer

(C) Network Layer

(D) Data link Layer

1.5 Which of the following communication medium supports highest data rate ?

(A) Ethernet

(B) Bluetooth

(C) Optical Fibre

(D) Wi-Fi

1.6 The IIoT stands for :

(A) Indepth Internet of Things.

(B) Innovative Internet of Things.

(C) Information Internet of Things.

(D) Industrial Internet of Things.

1.7 What are the challenges in IoT ?

(A) Energy Consumption

(B) Security

(C) Network Congestion

(D) All the above

1.8 _____ tags, devices, smart phones useful in identification.

(A) IETF 6LoWPAN

(B) IEFT CoAP

(C) RFID/NFC

(D) IEEE 802.15.4.LoWPAN

1.9 Which protocol interacts asynchronously over UDP ?

(A) HMTP

(B) CoAP

(C) MQTT

(D) TCP/IP

1.10 WSN stands for _____.

(A) Wired Sensor Network

(B) Wireless Sensor Network

(C) Wired Service Network

(D) Wireless Service Network

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 AMQP uses UDP protocol.

2.2 Arduino provide IDE Environment.

2.3 Arduino provides only digital input ports.

2.4 LCD is a display device.

2.5 Conditional statements cannot be used in Arduino programming.

2.6 Code once written cannot be uploaded to Arduino board.

2.7 IoT supports both wired and wireless communication.

2.8 Cloud is a part of IoT architecture.

2.9 Float is a valid data type of embedded C language.

2.10 Embedded C language does not support function calls.

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

(1x10)

X		Y	
3.1	Ethernet	**A.**	4 layered
3.2	Bluetooth	**B.**	7 layered
3.3	LDR	**C.**	Actuator
3.4	DC Motor	**D.**	OCEAN Theory
3.5	Microprocessor	**E.**	Sensor
3.6	Microcontroller	**F.**	Used in Personal Computer
3.7	Sketch	**G.**	Used in washing machine
3.8	Determine Personality	**H.**	Used in Wired Communication
3.9	TCP/IP Model	**I.**	Used in Wireless Communication
3.10	OSI Model	**J.**	Used to write Arduino code
		K.	Linux
		L.	Grapevine
		M.	Arduino

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.	Bluetooth	**B.**	long	**C.**	data storage
D.	short	**E.**	tagging	**F.**	send
G.	receives	**H.**	low	**I.**	wireless
J.	wired	**K.**	less	**L.**	high
M.	sensor				

4.1 RFID is a _____ technology.

4.2 IoT devices should consume _____ energy.

4.3 Bluetooth operates in _____ range.

4.4 Bluetooth consumes _____ power.

4.5 Wireless Speakers works on _____ technology.

4.6 Wi-Fi has _____ scalability.

4.7 Sensors _____ data from environment and sends it to other devices.

4.8 IoT data scalability takes care of _____.

4.9 Microwave is _____ signal.

4.10 Fiber optics is _____.

PART TWO

(Answer any four questions)

5. (a) Describe architecture layers of IoT.

(b) Discuss some applications of IoT.

(8+7)

6. (a) Explain the role of microcontroller in a IoT based device. Also mention its key features.

(b) What is Arduino ? List down its major components.

(8+7)

7. (a) Explain the working of control system of the refrigerator.

(b) Explain Wi-Fi, a wireless technology used with IoT devices.

(8+7)

8. (a) Explain the pin configuration of MQ135 gas sensor. Show the connections of MQ135 with Arduino to monitor the air quality periodically.

(b) Write a code for the same.

(8+7)

9. (a) What are different techniques to manage stress ?

(b) What are the largest security challenges in IoT ?

(8+7)

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