A10.4-R5 : INTERNET OF THINGS USING RASBERRY PI

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

परीक्षार्थियों के लिए निर्देश :	Instructions for Candidates :
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 अंग्रेजी भाषा में है। परीक्षार्थी उत्तर लिखने के लिए केवल अंग्रेजी भाषा का ही प्रयोग कर सकते हैं।	Question Paper is in English language. Candidate has to 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, इस प्रश्न-पत्र के साथ दी गई **ओएमआर उत्तर-पुस्तिका** पर, उसमें दिये गए अनुदेशों के अनुसार 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, 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**.
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 यह जाँच कर 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.

10.4-R5: INTERNET OF THINGS USING
RASBERRY PI

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 Gyroscope is used for :

(A) Anti-theft

(B) Capacitive proximity sensing

(C) Gaming

(D) Angle detection

1.2 Which sensor is used for tracking rotation or twist ?

(A) Proximity

(B) Rotary

(C) Twister

(D) Gyroscope

1.3 Which of the following is open standard?

(A) CoAP

(B) MQTT

(C) XMPP

(D) HTTP

1.4 Which of the following is the standard ports of MQTT ?

(A) I2C

(B) SSL

(C) USART

(D) TCP/IP

1.5 URI and content type support are features of which protocol ?

(A) SPI

(B) UDP

(C) HTTP

(D) CoAP

1.6 CoAP is specialized in which of the following?

(A) Internet applications

(B) Device applications

(C) Wireless applications

(D) Wired applications

SPACE FOR ROUGH WORK

1.7 HART in wireless HART protocol stands for?

    (A) Highway Addressable Remote Transducer

    (B) High Addressable Remote Transducer

    (C) Highway Application Remote Transducer

    (D) High Application Remote Transducer

1.8 A sensor uses which network?

    (A) LAN and HAN

    (B) HAN and PAN

    (C) LAN and PAN

    (D) LAN, PAN and HAN

1.9 XMPP creates the identity for?

    (A) Device

    (B) Message

    (C) Data

    (D) User

1.10 Which XMPP core described client server messaging?

    (A) RFC 6122

    (B) RFC 4854

    (C) RFC 6120

    (D) RFC 3923

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 ARM instruction set architecture is used in Rasberry Pi 3.

2.2 Rasberry Pi zero W model of Rpi does not contain wifi module

2.3 There are 4 default USB ports present in Rasberry Pi 3

2.4 X86 instruction set architecture is used in Rasberry Pi 3

2.5 128-bit processor is used in Rasberry Pi 3

2.6 Rasberry Pi 2 has a 900 MHz speed of operation

2.7 For Rasberry Pi zero ESP2866 is required for wifi connectivity

2.8 Male HDMI and adapter is used to connect TV to Rasberry Pi

2.9 COAP protocol uses publish subscribe model for communication

2.10 IPV6 is used to increase the number of IP addresses in IOT

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	MAC Protocols	A	connectivity
3.2	LowPAN	B	Data Protocol
3.3	IOTivity	C	Multi layer framework
3.4	DNS-SD	D	Deterministic and Random
3.5	MQTT	E	Discovery
3.6	802.15.4	F	Previous error values
3.7	FFD	G	Layer 3 and above
3.8	Hysteresis	H	PAN coordinator
3.9	Zigbee	I	Analog and Digital
3.10	Sensor	J	FFD and RFD
		K	High level datalink control
		L	layer 1
		M	UNIX

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	Security	B	Encapsulation	C	Transport	D	Network
E	Session	F	Physical	G	Data link	H	Presentation
I	Data link	J	Management	K	Routing	L	Application
M	packet						

4.1 LoRaWAN is a _____ layer protocol in IoT.

4.2 CORPL is a _____ layer protocol in IOT

4.3 IEEE 1905 is a _____ layer protocol in IOT.

4.4 XMPP and COAP are _____ layer protocols in IOT

4.5 Oath 2.0 is _____ layer protocol in IOT

4.6 SMACK is _____ layer protocol in IOT

4.7 802.15.4e is a _____ layer protocol in IOT.

4.8 Wireless hart is _____ layer protocol in IOT.

4.9 Encapsulation and routing are features of _____ layer in IOT.

4.10 Wifi and zigbee are _____ layer protocol in IOT

PART TWO

(Answer any four questions)

5. (a) Explain the layered architecture of IoT and the protocols used at different layers.

   (b) Discuss the various model of Raspberry Pi Model.

   (c) What is the procedure to set us new R Pi 3. **(5+5+5)**

6. Briefly explain the working and use on following protocols (any three) **(5+5+5)**

   (a) CoAP

   (b) SMQTT

   (c) AMQP

   (d) Zigbee

7. (a) Draw and explain the use of IoT is healthcare using Rasberry Pi?

   (b) How IoT is useful in transportation? **(8+7)**

8. (a) Discuss general purpose I/o pin of RPi 3.

   (b) What is Wireless HART? Explain with its architecture and use. **(8+7)**

9. (a) What is sensorial deviation and hysteresis error in sensor readings?

   (b) What is IPV6? How is it different from IPV4 in terms of architecture? **(8+7)**

- o O o -

SPACE FOR ROUGH WORK