# A10.4-R5 : INTERNET OF THINGS (IoT) USING RASPBERRY PI

**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.**

(1 x 10)

1.1 Maximum length of a python identifier

(A) No fixed length specified

(B) 16 character

(C) 32 character

(D) 64 character

1.2 A compact integrated circuit designed to govern a specific operation in an embedded system.

(A) Microcontroller

(B) Mini Computer

(C) Computer

(D) Tablet

1.3 Which raspberry pi model has an Ethernet port ?

(A) Model A+

(B) Model B+

(C) Both (A) and (B)

(D) None of the above

1.4 Raspbian is based on :

(A) Linux

(B) Windows

(C) Mac

(D) depends on application

1.5 The dmesg command

(A) Shows user login logoff attempts

(B) Show user history

(C) Show directory access history

(D) kernel log messages

1.6 Which command is used to display the operating system name ?

(A) os

(B) uname

(C) kernel

(D) linux

**1.7** A simple _____ has a stationary set of magnets in the stator and an armature with one or more windings of insulated wire wrapped around a soft iron core that concentrates the magnetic field.

  (A) DC Motor

  (B) Any Motor

  (C) Servo motor

  (D) Rotor Motor

**1.8** UART is used for exchanging _____ data between two devices.

  (A) parallel

  (B) serial

  (C) compressed

  (D) user

**1.9** A setting that can be switched between two different options by performing a single action

  (A) Toggling

  (B) on-off

  (C) Reset

  (D) switching

**1.10** For the home automation for door locking, we can use

  (A) Arduino only

  (B) Raspberry only

  (C) Either (A) or (B)

  (D) None of the above

**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.**

**(1 x 10)**

**2.1** Raspberry Pi model B+ have 40 GPIO pins.

**2.2** MQTT protocol does not require broker.

**2.3** The dm command can be used to remove files.

**2.4** IPv6 is more favorable for the IoT environment.

**2.5** The sort command by default does not sorts in the numeric order.

**2.6** Sensors collect data automatically.

**2.7** Python is a general purpose object-oriented programming language.

**2.8** Raspberry Pi need external hardware.

**2.9** File containing a series of commands called as shell script.

**2.10** Read command is not internal tool of a shell.

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.**

(1 x 10)

| | X | | Y |
|---|---|---|---|
| **3.1** | Sensor | **A** | clean up all the programs you've done |
| **3.2** | Actuator | **B** | Physical address |
| **3.3** | Sequence type data type | **C** | List and tuple |
| **3.4** | WiFi | **D** | Communication Module |
| **3.5** | GPIO. cleanup() | **E** | Used as input device |
| **3.6** | MAC | **F** | DC Motor |
| **3.7** | MQTT | **G** | Urllib |
| **3.8** | LED | **H** | Used as output device |
| **3.9** | used to fetch URLs | **I** | Cpp library for Raspberry Pi |
| **3.10** | WiringPi | **J** | Application Layer protocol |
| | | **K** | clean up all the ports you've used |
| | | **L** | Network Layer Protocol |
| | | **M** | Temperature and pressure |

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

(1 x 10)

| A. | Smart city | B. | 128 | C. | Mosquito | D. | cat /etc/os-release |
|----|-----------|----|-----|----|----------|----|---------------------|
| E. | Kevin Ashton | F. | Numpy | G. | M2M | H. | Web simulator |
| I. | Modorose | J. | MVC | K. | Install software | L. | 32 |
| M. | Kevin Brown | | | | | | |

4.1 _____ first time coined the term IoT.

4.2 _____ one of the important python library.

4.3 Size of the IPv6 is _____ bit.

4.4 Node red is a _____ .

4.5 PIP is used to _____.

4.6 _____ communication requires no human intervention or minimal human intervention.

4.7 _____ command give information about the OS running on a Raspberry Pi.

4.8 _____ is an application of IoT.

4.9 Bottle implements a version of the _____ software pattern.

4.10 _____ is a broker for the application layer protocol.

**PART TWO**

**(Answer any FOUR questions)**

5. (a) Briefly explain the IoT protocols at application layer with required architecture of the protocols.

   (b) Explain the Raspberry Pi device and its role in IoT development.

   **(8+7)**

6. (a) What are the roles of cloud computing in IoT device development ? Explain the need of data storage of IoT device at cloud.

   (b) Write LED blink program in python for Raspberry Pi.

   **(9+6)**

7. (a) What is shell scripting ? What are the benefits of doing shell scripting ? Differentiate between shell and kernel.

   (b) What is WiringPi and, how it is associated with Raspberry Pi ?

   **(8+7)**

8. (a) Explain how IoT and Raspberry Pi is useful in smart university campus ? List out the hardware required for the same.

   (b) Write about Node-red and its uses in IoT protocol simulation.

   **(8+7)**

9. (a) How can you make web request from python ?

   (b) What do you mean by "things" in IoT ? Explain.

   **(9+6)**

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**SPACE FOR ROUGH WORK**

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