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 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 The hall effect sensor is used to measure _____.

(A) Acceleration

(B) Pressure

(C) Temperature

(D) Humidity

1.2 The photoelectric technology is used to design _____.

(A) Optical sensor

(B) Proximity sensor

(C) Image sensor

(D) Motion sensor

1.3 MQTT is abbreviation for :

(A) Message Queuing Transport Telemetry

(B) Message Quality Transport Telemetry

(C) Message Queuing Telegram Telemetry

(D) Message Queuing Telemetry Transport

1.4 The power supply is connected to Raspberry Pi using _____.

(A) USB connection

(B) Internal battery

(C) Charger

(D) Adapter

1.5 The number of USB ports present in Raspberry Pi 3 :

(A) 6

(B) 4

(C) 2

(D) 0

1.6 Which command is used to display the unix version ?

(A) uname-r

(B) uname-n

(C) uname-t

(D) kernel

1.7 How to execute ls command inside a vi editor ?

(A) !ls

(B) :ls

(C) :!ls

(D) we can't execute

1.8 Which command will you use to see the available routes ?

(A) show route

(B) route status

(C) netstat-r

(D) none of the mentioned

1.9 The command to display the current date in the form dd/mm/yyyy :

(A) date+%d/%m/%Y

(B) date+"%d/%m/%Y"

(C) date+/%d/%m/20%y

(D) date+"/%d/%m/20%y"

1.10 The command syntax to display the file 'sample.txt' one page at a time is :

(A) man sample.txt>more

(B) cat sample.txt<more

(C) cat sample.txt|more

(D) none of the mentioned Machine

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 In linux command wc used to find out number of lines, word count, byte and characters count in the files specified in the file arguments.

2.2 In linux rm command used to remove directory.

2.3 The physical layer of a network defines the electrical characteristics of signals passed between the computer and communication devices.

2.4 FTP in TCP/IP protocol is used for remote terminal connection service.

2.5 Raspberry Pi have an internal memory.

2.6 USB connection based power supply is used to drive Raspberry Pi.

2.7 ARM instruction set architecture is used in Raspberry Pi.

2.8 MQTT is an open standard.

2.9 MQTT support security.

2.10 Vint Cerf created MQTT.

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	GPIO	**A.**	5
3.2	LM 35	**B.**	File containing a series of commands
3.3	DHT 11	**C.**	Independent portable operating system
3.4	HDMI	**D.**	Light Sensor
3.5	GPU	**E.**	General Purpose Independent Output
3.6	PIP	**F.**	Make File Solution
3.7	round (4.567)	**G.**	Make File System
3.8	mkfs in linux	**H.**	Preferred Installer Program
3.9	Shell script	**I.**	Graphics Processing Unit
3.10	Linux	**J.**	High Definition Multimedia Interface
		K.	General Purpose Input Output
		L.	Humidity Sensor
		M.	Temperature Sensor

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.	7	**B.**	def	**C.**	.hex	**D.**	$
E.	lambda	**F.**	Class	**G.**	#	**H.**	2.56 V
I.	List	**J.**	trap	**K.**	Input/Output (I/O)	**L.**	5 V
M.	sh						

4.1 In shell programming, _____ command is used to spawn a child of our own choice for running a script.

4.2 In shell programming, the program is interrupted by _____ command in appropriate way.

4.3 With _____ first line of every shell script begins.

4.4 The value of expression 4 + 3 % 5 is _____.

4.5 _____ keyword is used for function in Python language.

4.6 Python supports the creation of anonymous functions at runtime, using a construct called _____.

4.7 _____ is the internal Vref selected for an Atmega32 series based microcontrollers.

4.8 The 8255 is _____ chip.

4.9 Microcontrollers are loaded with _____ extension as they understand the language of 0's and 1's only.

4.10 The _____ is a user-defined data type.

PART-TWO

(Answer any FOUR questions)

5. (a) Illustrate the Python based process for creating and accessing certain information.

   (b) Illustrate the layered architecture of IoT and their functionalities. **(7+8)**

6. (a) What is Node-Red ? Illustrate the process of using Node-Red to make MQTT dashboard.

   (b) Illustrate web server and explain the process for controlling GPIO outputs through web. **(7+8)**

7. (a) Illustrate GPIO of raspberry Pi board in detail.

   (b) Illustrate the process of using Wiring Pi library on Raspberry Pi. **(7+8)**

8. (a) Explain the file handling process in linux.

   (b) Illustrate shell scripting and the process to run a script on regular basis. **(7+8)**

9. (a) Illustrate the single board computer, its architecture and one possible use case.

   (b) Explain the functional blocks of Raspberry Pi with the help of architectural diagram. **(7+8)**

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SPACE FOR ROUGH WORK