Contents

SAVITRIBAI PHULE PUNE UNIVERSITY

S. Y. B. Sc. (Computer Science)
Electronics Practical Examination

Exam. Seat No. _____

Time Duration: 3Hours **Max Marks: 35**

Distribution of Marks

Circuit/Block Diagram	Flowchart/ Algorithm	Python Program	Execution & Result	Experiment Oral	Activity Oral	Total
05	**05**	**08**	**07**	**05**	**05**	**35**

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A1: Interface and Program Raspberry Pi to control LED/LED's

1. Draw the circuit / block diagram of LED/LED's attached to GPIO Pins of Raspberry Pi.
2. Write an algorithm for interfacing LED/LED's with GPIO pin. Show it to Examiner.
3. Write Program in Python language to **ON/OFF or Blink or Counter** action of LED/LED's attached to GPIO pins.
4. Execute the Program and show the execution result to the examiner.
5. Write working principle of LED.
6. What is RAM size used in Raspberry Pi-3?

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A2: Interface and Program Raspberry Pi to get feedback from a switch

1. Draw circuit / block diagram of switch& LED attached to GPIO Pins of Raspberry Pi.
2. Write an algorithm for Switch& LED interfaced to GPIO pins with Raspberry Pi.

   Show it to Examiner.
3. Write Program in Python language to get the feedback from Switch& LED attached to GPIO pin.
4. Execute the Program and show the execution result to the examiner.
5. What are GPIO pins?
6. What are different types of Switches?

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A3: Interface and Program the Raspberry Pi to get the temperature from a sensor

1. Draw the circuit diagram/block diagram of temperature sensor interfacing with Raspberry Pi.
2. Write an algorithm /Flowchart for temperature interfacing with Raspberry Pi.
3. Write a Program in Python language to get the temperature from a sensor connected to GPIO pins and display it on LCD /Monitor Screen.
4. Show the execution and result to the Examiner.
5. List different types of Temperature Sensors.
6. Give Specifications, Parameters of temperature sensors used in this experiment.

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A4: Interface and Program Raspberry Pi to detect room light from a Photocell sensor

1. Draw circuit/Block diagram of Photocell sensor interfacing with Raspberry Pi.
2. Write an algorithm /Flowchart of Photocell sensor interfacing with Raspberry Pi.
3. Write a Program in Python language to detect room light from a Photocell sensor connected to GPIO pins and display it on LCD /Monitor Screen.
4. Show execution and result to the Examiner
5. Explain Working Principal of Photocell
6. What is the role of ADC when interfacing it with the Photocell sensor?

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A5: Interface and Program Raspberry Pi for Motion detection using PIR

1. Draw block circuit /diagram of motion detection using Raspberry Pi.
2. Write an algorithm to detect motion using Raspberry Pi. Show it to Examiner.
3. Write Program in Python language to detect motion using PIR and presence indication through LED /Buzzer.
4. Execute the Program and show execution result to the examiner.
5. On which Operating System, does the Raspberry Pi works?
6. Write any 5 applications of PIR sensor?

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A6: Interface and Program Raspberry Pi for interfacing Pi-camera

1. Draw block diagram of Camera interfaced to Raspberry Pi.

2. Write an algorithm to grab the image using Camera. Show it to Examiner.

3. Write Program in Python language to grab the **image/video** using camera.

4. Execute the Program and show execution result to the examiner.

5.To which port of Raspberry Pi, the Camera module is connected?

6. How many USB ports are available in Raspberry Pi 3 B+ model?

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B1: Interface and Program GSM System for Messages /Voice Call/ ON-OFF action.

1. Draw the block diagram of GSM System.
2. Write AT commands to send and receive the **messages / voice call** using GSM module and Hyper terminal on PC and Show it to Examiner

OR

2. Write an Arduino Program using AT commands for **Lamps/ LED /Motor** ON/OFF system or any application through SMS. Show execution to the Examiner.
3. Show the connection and execution. Show it to the examiner.
4. Write Function of PSTN and BIT in GSM system.
5. Define AT command?

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B2: To study working of SIM card in GSM handset (SIM card detection)

1. Draw the block diagram for interfacing SIM card holder with GSM.
2. Write AT commands to check the modem connection and SIM connectivity, network and services.

   Read the stored messages in SIM using AT commands.
3. Show the connection and execution properly on the PC. Show it to the examiner.
4. Why does a GSM module require a SIM card?
5. Give the full form of SIM.

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B3: Study of GPRS system

1. Draw circuit /block diagram of GPRS system to interface Humidity/Temperature sensor with Arduino.
2. Write AT Commands and initial setup for sending Humidity/Temperature sensor data on cloud.
3. Write program to send Humidity/Temperature measurement data on cloud application system using Thingspeaks/other.
4. Show the cloud (Thingspeaks/other) setup on PC.Show it to the examiner
5. What is the use of cloud: Thingspeaks/other& write steps for making a dashboard on it to receive data.
6. What is the difference between GSM and GPRS?

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B4: Study of Zig-bee

1. Draw the block diagram of Zig-bee for Transmitter and Receiver for Temperature/Humidity Sensor
2. Write an algorithm for Transmitter and Receiver for Temperature/Humidity Sensor.
3. Write Arduino Program for Transmitter Temperature/Humidity Sensor dataand Receiver on LCD/Monitor.
4. Show Execution and result to the examiner
5. Explain how communication takes place between two Zig-bee modules (Transmitter and Receiver)
6. Define Protocol? Which IEEE protocol is used in the Zig-bee Communication?

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B5: Study of RFID system

1. Draw block diagram of RFID system interfaced with Arduino.

2. Write an algorithm for RFID system interfaced with Arduino. Show it to Examiner.

3. Write an Arduino Programfor RFID based Access control system with LED or LCD indication.

4. Execute the Program and show execution result to the examiner.

7. What is RFID stands for?

8. How many digital Input/Output pins are available on Arduino?

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B6 : Python Programming

1. To access GPIO pins, which instructions are used?

2. Write aPython program to find Sum and difference of a=20,b= 11.

3. Write a Python program to find area and perimeter of a triangle.

4. Write a Python program to append name in the given below list?
   Names = ["Joseph", "Peter", "Cook", "Tim"]
5. Write a Python program to sort the given dictionary.
   names = {1:'Alice' ,2:'John' ,4:'Peter' ,3:'Andrew' ,6:'Ruffalo' ,5:'Chris'}

6. Write syntax for at least three data types of Python language.

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B7: To study Arduino based LED switching using Bluetooth and Mobile.

1. Draw block diagram of Arduino based LED switching using Bluetooth & Mobile.
2. Write an algorithm for Arduino with LED Switching using Bluetooth & Mobile apps.

   Show it to Examiner.
3. Write Program in Arduino to control LED using Bluetooth & Mobile apps.
4. Execute the Program and show the execution result to the examiner.
5. What is the range of Bluetooth (HC-05) Device?
6. How Arduino is different from Raspberry Pi?

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B8: Temperature and Humidity sensing using Arduino

1. Draw block diagram of Arduino based Temperature and Humidity measurement using Arduino.
2. Write an algorithm/ Flowchart for Temperature & Humidity measurement using Arduino. Show it to Examiner.
3. Write Program in Arduino to measure temperature and humidity using DHT11 sensor and display it on LCD/Serial Monitor of Arduino IDE.

4. Execute the Program and show the execution result to the examiner.

5. How many Analog pins are available on Arduino Board?

6. Explain working principle of DHT 11 sensor.

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B9: Study of LORA Interfacing

1. Draw the block diagram of Lora Interfacing for Temperature and Humidity measurement.

2. Write Arduino Program for Lora Interfacing for Temperature and Humidity measurement.

3. Show the execution and result to the Examiner.

4.Give full form of Lora.

5. What is the range and frequency used in Lora interfacing?