Krantiguru Shyamji Krishna Verma Kachchh University, Bhuj
Master of Science (Computer Applications & Information Technology)
Semester: VIII

Paper Code: CECS816	Total Credit : 4
Title of Paper: Embedded Systems	**Total Marks :** 70
	Time : 3 Hrs

Unit	Description	Weighting
I	**Introduction** What is IoT?, Examples of IoT, Appliances, Smart Health care, Oil & Gas Industry, Smart Places, IoT v/s Computer v/s Smartphone, Adoption and trends in IoT, Social benefits of IoT, Risk-Security-Privacy of IoT. Embedded Systems: An introduction to embedded systems, examples, generic structure of embedded system, sensors and actuators, Analog / Digital Conversion, basic devices.	20%
II	**Arduino Basics** IDE, Setting up Arduino Board, Arduino Sketch, Uploading and Running Blink Sketch, Creating and Saving Sketch, Structure of Sketch, Primitive Types, Functional Blocks, Conditions, Loops, Operators.	20%
III	**Arduino Communications** Sending Debug Information from Arduino to Your Computer, Sending Formatted Text and Numeric Data from Arduino, Receiving Serial Data in Arduino, Sending Multiple Text Fields from Arduino in a Single Message, Receiving Multiple Text Fields in a Single Message in Arduino, Sending Binary Data from Arduino, Receiving Binary Data from Arduino on a Computer, Sending Binary Values from Processing to Arduino, Sending the Value of Multiple Arduino Pins, How to Move the Mouse Cursor on a PC or Mac, Controlling Google Earth Using Arduino, Logging Arduino Data to a File on Your Computer, Sending Data to Two Serial Devices at the Same Time, Receiving Serial Data from Two Devices at the Same Time, Setting Up Processing on Your Computer to Send and Receive Serial Data.	20%
IV	**Input** Using a Switch, Using a Switch Without External Resistors, Reliably Detecting the Closing of a Switch, Determining How Long a Switch Is Pressed, Reading a Keypad, Reading Analog Values, Changing the Range of Values, Reading More Than Six Analog Inputs, Displaying Voltages Up to 5V, Responding to Changes in Voltage, Measuring Voltages More Than 5V (Voltage Dividers) Detecting Movement, Detecting Light, Detecting Motion (Integrating Passive Infrared Detectors), Measuring Distance, Measuring Distance Accurately, Detecting Vibration, Detecting Sound, Measuring Temperature, Reading RFID Tags, Tracking Rotary Movement, Using a Mouse, Getting Location from a GPS	20%
V	**Introduction to Raspberry Pi** A Tour of the Boards, The Proper Peripherals, The Case, Flash the SD Card, Booting Up, Configuring Your Pi, Shutting Down, Troubleshooting **Linux on the Raspberry Pi** Using the Command Line, Files and the Filesystem, More Linux Commands, Processes, Sudo and Permissions, The Network, /etc, Setting the Date and Time, Installing New Software, Python on Raspberry Pi **Programming Inputs and Outputs with Python** Installing and Testing GPIO in Python, Blinking an LED, Reading a Button **Working with Webcams** Testing Webcams, Installing and Testing SimpleCV, Displaying an Image.	20%
Basic Text & Reference Books :-		
1.	Arduino Cookbook, Michael Margolis, O'Reilly	
2.	Getting Started with Raspberry Pi, Matt Richardson, O'Reilly	

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Unit	Description		Total Marks
I	Q.1 (A) Answer the Following. (Definitions, Blanks, Full Forms, True/False, Match the Following)	06	14
	Q.1 (B) Medium / Long Questions. (With Internal Option)	08	
II	Q.2 (A) Answer the Following. (Definitions, Blanks, Full Forms, True/False, Match the Following)	06	14
	Q.2 (B) Medium / Long Questions. (With Internal Option)	08	
III	Q.3 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.3 (B) Medium / Long Questions. (With Internal Option)	08	
IV	Q.4 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.4 (B) Medium / Long Questions. (With Internal Option)	08	
V	Q.5 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.5 (B) Medium / Long Questions. (With Internal Option)	08	