PART-A (10 x 2 = 20 Marks)

1. When 8051 is reset, all interrupts are disabled. How to enable these interrupts?

Each of the interrupt sources can be individually enabled or disabled by setting or clearing a bit in the special functions register IE.

IE also has a global disable bit, which disables all interrupts at once.

2. What is microcontroller?

A microcontroller is a small computer on a single integrated circu containing a processor core, memory and programmable input/outpu peripherals.

❖ Microcontrollers are designed for embedded applications.

3. What is Priority inheritance?

Priority inheritance is a method of eliminating priority inversion, usin

this a process scheduling algorithm will increase the priority of a proces

to the maximum priority of any process waiting for any resource on whic

the process has a resource lock.

4. List the types of context switching.

1. Register context switch

2. Task context switch

3. Thread context switch

4. Process context switch

5. What is an IoT Device?

IoT devices are pieces of hardware, such as sensors, actuators, gadge

appliances, or machines, that are programmed for certain applications and can

tranimit data over the internet or other networks. They can be embedded

ether mobile devices, industrial equipment, environmental sensors, mec

devices, and more.

loT devices are connected to the Internet and send information ab

themselves or about their surroundings over a network or allow actuation upc

the physical entities/environment around them remotely.

6. What is meant by Actuators?

Another type of transducer that we will encounter in many lot systems is an actuator. In simple terms, an actuator operates in the reverse direction of a sensor. It takes an electrical input and turns it into physical action. For instance, an electric motor, a hydraulic system, and a pneumatic system are all different types of actuators.

In the strict meaning, actuator is a device that converts energy in movement. It could be a valve or a motor. But I prefer not to be so strict, I consider an actuactor anything that can convert electric energy in an output, for example a display, a led, a loudspeaker.

7. What is meant by stateless protocols ?

It is a network model in which the client sends a request to the server and the server in return sends a response back according to the current state just like request-response model.

The server is not obliged to keep the session information or the status of each communication partner for multiple requests.

They are very easy to implement on the Internet.

Stateless protocols work better when the crash occurs because no state needs to be restored a failed server can simply reboot after a crash.

8. Define REST Based Communication API,

Example: HTTP(Hyper Text Transfer protocol), UDP(User Datagram Protocol), DNS (Domain Name System)

→ Representational state transfer(REST) is a set of architectural principles by which you can design web service and Web API that focus on a system resources and how resources states and addressed the transferred.

REST API follow the request response communication model. The REST architectural constraints apply to the components, connectors, and data elements.

9. What is meant by smart cities?

Managing a city bears some resemblance to managing a corporate enterprise. As the need for efficiency increases, new tools help increase operational efficiency. For cities, just as for businesses, digitization transforms the perspective on operations. New ideas emerge, bringing different approaches to solving management issues. Scalable solutions utilizing information and communications technology (ICT) can alleviate many issues urban centers face today by increasing efficiency, which reduces costs and enhances quality of life. Cities that take this approach are commonly referred to as smart cities.

10. What is the purpose of home automation system?

The purpose of the home automation system is to control the lights in a typical home remotely using a web applications. The system includes auto and manual modes. In auto mode, the system measures the light in a room and switches on the light when it gets dark. In manual mode, the system provides the option of manually and remotely switching on/off the light.

PART B (5 x 13 = 65 Marks)

11. (a) What is the difference between the microprocessors and microcontrollers?

Ans: Refer Section No. 1.2

[OR]

Page No. 1.1

(6) Explain with suitable example concept of serial port programming.

Ans: Refer Section No. 1.4

12. (a) Explain about LCD interfacing.

Ans: Refer Section No. 2.3.1

Page No. 1.62

Page No. 2.13

[OR]

Page No. 2.24

(b) Explain about Keyboard Interfacing.

Ans: Refer Section No. 2.3.2

13. (a) List out the loT challenges in details.

Ans: Refer Section No. 3.2

Page No. 3.14

[OR]

(b) Explain about Arduino programming structure.

Ans: Refer Section No. 3.7

Page No. 3.40

14. (a) Explain about Zigbee and its role in loT.

Ans: Refer Section No. 4.8

Page No. 4.29

[OR]

(b) Explain about raspberry Pi interfacing and raspberry Pi programming.

Ans: Refer Section No. 4.12, 4.13 Page No. 4.65, 4.66

15. (a) Explain in detail the design steps of modern train controller with sui

table diagrams.

Ans: Refer Section No. 5.9

Page No. 5.52

[OR]

(b) Describe the structural and behavioral description of methods usec designing an embedded system.

Ans: Refer Section No. 5.2

Page No. 5.8

PART C (1 x 15 = 15 Marks)

16. (a) Discuss about the development of Smart cities in detail.

Ans: Refer Section No. 5.7

Page No. 5.46

(b) Describe the architecture of 8051 with a neat diagram.

Ans: Refer Section No. 1.6

[OR]

Page No. 1.11