**CONTENT ASSESSMENT 3**

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**Textbook chapter 3 gives some distinctive characteristics of embedded systems.**

**Question 1:**

**• Describe three of these characteristics.**

**Ans:**

Embedded systems have some distinctive characteristics:

* They tend to have specific and dedicated applications.

Embedded system includes number of different microprocessors so every microprocessor have specific and dedicated applications that is made according to the architecture of the microprocessor.Some embedded system can run differet applications at the same time like computer while some are made to run specific application.like home appliances, home and office automation, security, telecommunication etc.

* They often have limited processing power, memory availability, and storage capabilities.

As microcontrollers are embedded system so every microcontroller have different specifications according to its main processing unit (processor).The specifications includes its computing power, processing speed, Volatile memory and permanemt storage. The more these specifications better the more controller is better. Also it also includes the number of different interfaces to connect with other devices.

* They often work in real time, where their outputs are directly related to present inputs (e.g., control systems).

The embedded system have property to work in real time simulation environment so their output depens on the input of the system. e.g. control system. Control system of any device is the best example of this ditinctive property.Embedded systems are widely used in making control system starting from child toy to big plant system.All the automatic transmission cars have control system which take input from the user and produce the corresponding output by continuously checking the input hundereds of time in every second.

**Question 2:**

**Describe whether or not the RPi is an embedded system.**

**Ans:**

Before going to decide whether the raspberry pi is embedded system device or not, we first consider the definition of embedded system. An embedded system is the combination of computer hardware and software that is designed to perform some specific functions are some time programmed in which user can put their own program according to his demand and performance. For a device to become an embedded system, some key features must be present in the device. An embedded system device must have hardware with its compatible software. The software of the device can be changeable and modify according to the need. The embedded system device must have option to take input from sensors or GPIO pins and have ports or GPIO pins to show the corresponding output. The basic components of the embedded system are same like computer i.e. have a brain called CPU, memory (RAM) and secondary memory (SD card) and USB ports, audio I/O ports and have interface to connect with other digital and analog devices.

If we talk about the raspberry pi of any model, all the models have these features and that’s why raspberry board called a mini computer. The raspberry pi board has a CPU for processing that act like board brain, A RAM that stores the primary memory and an SD card slot to make its memory secondary, have feature to attach camera and display, USB ports for peripheral devices and USB ports have plug and play driver like in actual computer. The basic difference between an embedded system device and electronic device is that with electronic computing device we can perform a specific type of tasks and cannot change its base features in which it is programmed. while in embedded system we can program the device according to our own desire and can perform every kind of task with the help of programming. Actually, in embedded system we with the help of programming train the computer brain to perform task and take critical decisions according to the current circumstances by thinking. The embedded system proved to be a highly computing device.so by taking all the features of embedded system under consideration and compare with the generic feature of raspberry pi we conclude that “**Raspberry Pi is an embedded system**”.