



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

## ELECTRONICS AND COMMUNICATION ENGINEERING

### ASSIGNMENT QUESTIONS

Course Name	:	EMBEDDED SYSTEMS
Course Code	:	A70440-R15
Class	:	IV B. Tech I Semester
Branch	:	ECE
Year	:	2018 – 2019
Course Coordinator	:	Mr. N Paparao Assistant Professor, ECE Dept
Course Faculty	:	Mr. S Lakshmanachari, Assistant Professor, ECE Dept Mr. MD.Khadir, Assistant Professor, ECE Dept

#### COURSE OBJECTIVES:

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process

ASSIGNMENT-I			
UNIT-I INTRODUCTION TO EMBEDDED SYSTEMS			
S. No	Questions	Blooms Taxonomy Level	Course Outcome
1.	What is an embedded system? Explain the different applications of embedded systems?	Remember	1
2.	Explain the various purposes of embedded systems in detail with illustrative examples?	Understand	1
3.	Discuss in detail about the different classifications of embedded systems. Give an example for each?	Remember	1
4.	Explain the different characteristics of embedded systems in detail?	Understand	1
5.	What are the different qualities attributes to be considered in an embedded system design?	Understand	1
6.	Define operational quality attribute? Explain the important operational quality attributes to be considered in any embedded system design?	Understand	2
7.	What is the non-operational quality attribute? Explain the important operational quality attributes to be considered in any embedded system	Understand	2
8.	Discuss in detail about the quality attribute Response in the embedded system	Understand	3
9.	Explain the quality attribute Reliability in the embedded system design context?	Remember	3
10.	a. Explain the quality attribute information security in the embedded system design context? b. Explain the quality attribute safety in the embedded system design context?	Understand	3
UNIT II TYPICAL EMBEDDED SYSTEM			
1.	Which are the components used as the core of an embedded systems? Explain the merits and drawbacks?	Understand	4

2.	What is digital signal processing (DSP)? Explain the role of DSP in embedded system design?	Understand	4
3.	What is processor architecture? What are the different processor architectures available processor/controller design? Give an example	Remember	4
4.	Define programmable logic device? What are different types of PLDs? Explain the role of PLDs in embedded system design?	Understand	5
5.	What are the different types of memories used in embedded systems design? Explain the role of each?	Understand	5
6.	Define sensor? Explain its role in embedded system design? Illustrate with an example?	Remember	6
7.	Define actuator? Explain its role in embedded system design? Illustrate with an example?	Understand	6
8.	Explain the following terms, Explain the on different onboard communication interface in brief? Explain the on different external communication interface in brief?	Understand	6
9.	Explain the sequence of operation for communicating with an I2C slave device?	Remember	6
10.	Draw the interfacing diagram for connecting an LED to the port pin of a microcontroller. The LED is turned ON when the microcontroller port pin is at Logic 0.	Understand	6
11.	Explain the sequence of operation for communicating with 1 wire slave device	Understand	6
12.	Write a C program to interface 7 segment LED display to microcontroller 8051	Remember	6
13.	Write a C program to interfacing matrix keyboard to microcontroller 8051	Understand	6
<b>UNIT- III</b>			
<b>EMBEDDED FIRMWARE</b>			
1.	What is embedded firmware? What are the different approaches available for embedded firmware development?	Understand	8
2.	Discuss in detail about the functionality of RESET circuit in embedded system.	Remember	7
3.	Explain the role of Real Time Clock in embedded system.	Understand	7
4.	Explain the role of Watch dog Timer in embedded system.	Understand	7
5.	What is the role of Brown out protection circuit in embedded system.	Remember	7
<b>ASSIGNMENT-II</b>			
6.	Discuss in detail about the various steps involved in the assembling of an assembly language program?	Understand	8
7.	Explain the advantages of Assembly level language based on embedded firmware development?	Remember	8
8.	Explain the high level language based on embedded firmware development technique?	Understand	8
9.	Give the examples for situations demanding mixing of C with assembly? Explain the techniques for mixing of C with assembly?	Understand	8
10.	Give the examples for situations demanding mixing of assembly with C? Explain the techniques for mixing assembly with C?	Remember	8
<b>UNIT- IV</b>			
<b>RTOS BASED EMBEDDED SYSTEM DESIGN</b>			
1.	What is the difference between a general purpose kernel and real time kernel? Give an example for both?	Remember	9
2.	Explain the difference between memory management of general purpose kernel and real time kernel?	Understand	9
3.	Discuss in detail about the TASK and Process in the operating system context?	Understand	9
4.	Discuss in detail about the memory architecture of a process?	Remember	9
5.	Explain various activities involved in the creation of process and threads?	Understand	10
6.	What is process control block (PCB)? Explain the structure of the PCB.	Remember	9
7.	What is task control block (TCB)? Explain the structure of the TCB.	Understand	9
8.	Explain how multithreading can improve the performance of an application with an illustrative example?	Understand	10
9.	Explain thread context switch and the various activities performed in thread context switching for user level and kernel level threads.	Remember	10
10.	Discuss in detail about the various factors to be considered for the selection of scheduling criteria?	Understand	9
11.	Explain the different types of non-preemptive scheduling algorithms? State the merits and demerits of each?	Understand	10

12.	Explain the different types of preemptive scheduling algorithms? State the merits and demerits of each?	Remember	10
13.	What is the difference between Hard and Soft real time systems? Give an example for Hard and Soft real time kernels?	Understand	10
<b>UNIT-V</b> <b>TASK COMMUNICATION</b>			
1.	Discuss about the various process interaction models in detail?	Remember	11
2.	What is mean by inter process communication (IPC)? Give an overview of different IPC mechanisms adopted by various operating systems?	Understand	11
3.	Explain the synchronous and asynchronous messaging mechanisms for IPC under windows kernel?	Understand	11
4.	What is priority inversion? What are the different techniques adopted for handling priority inversion?	Remember	11
5.	Explain the different task communication synchronization issues encountered in inter process communication?	Understand	11
6.	Discuss in detail about the interlocked functions for locked based mutual under	Remember	11
7.	What is semaphore? Explain the different types of semaphores. Where it is used?	Understand	11
8.	What is critical section? What are the different techniques for controlling access to critical section?	Understand	11
9.	Explain the event and event object based synchronization mechanism for IPC Windows OS?	Remember	11
10.	Discuss in detail about the architecture of Device drivers?	Understand	11

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