QUESTION BANK

UNIT I- INTRODUCTION TO EMBEDDED
PART-A

1. Define a System.
2. What is an embedded system?
3. What are the typical characteristics of an embedded system?
4. What are the advantages of embedded system?
5. What are the disadvantages of embedded system?
6. What are the applications of an embedded system?
7. What are the various embedded system designs Modeling Refining or "partitioning"
8. What are the complicating factors in embedded design?
9. What are the real-time requirements of an embedded system?
10. What are the functional requirements of embedded system?
11. What are the main components of an embedded system?
12. Define embedded microcontroller.
13. Explain digital signal processing in embedded system continued digitization of signals increasing the role of DSP in ES.
14. What are the various classifications of embedded systems?
15. What are the two essential units of a processor on an embedded system?
16. What does the execution unit of a processor in an embedded system do?
17. Give examples for general purpose processor.
18. Define microprocessor.
19. When is Application Specific System processors ASSPs used in an embedded system?
20. What is the need for LCD and LED displays?
21. Define ROM image.
22. Define device driver.
23. Give some examples for small scale embedded systems.
24. Give some examples for medium scale embedded systems
25. Give some examples for sophisticated embedded systems.

PART-B
1. What is the need for IDE in an Embedded Architecture? Discuss.
2. Explain the various forms of memory and the functions assigned to them.
3. Explain the software embedded systems
4. Explain the components of exemplary embedded systems
5. Describe the architecture of a typical micro controller with a neat diagram.
6. Explain the basic processors and hardware units in the embedded system
7. Explain how software is embedded into a system
8. Explain the methods used in the embedded system on a chip
9. List the hard ware units that must be present in the embedded systems.

10. i Explain the Exemplary applications of each type of embed ded system. 8

ii Explain the different program layers in the embedded software and also the process of converting a "C" program into the file for ROM image with suitable block diagrams. 8

11. Explain the Embedded System on Chip SoC & in VLSI circuit.

12. i   Explain the various form of memories present in a system 8

ii Explain the software tools in designing of an embedded system. 8

UNIT-II-
PART-A

1. Define bus.
2. What are the classifications of I/O devices?
3. Give some examples for serial input I/O devices.
4. Give the steps for accomplishing input output data transfer.
5. Give the limitations of polling technique.
6. What do you meant by bus arbitration?
7. What are the two characteristics of synchronous communication?
8. What do you mean by asynchronous communication?
9. What are the characteristics of asynchronous communication?
10. What are the three ways of communication for a device?
11. Expand a SPI b SCI
12. What are the features of SPI?
13. Define software timer.
14. What are the forms of timer?
15. Define RTC
16. What is I2C?
17. What are the bits in I2C corresponding to?
18. What is a CAN bus? Where is it used?
19. What is USB? Where is it used?
20. What are the features of the USB protocol?
21. What are the four types of data transfer used in USB?
22. Explain briefly about PCI and PCI/X buses.
23. Mention some advanced bus standard protocols;
24. What do you meant by high speed device interfaces?
25. Mention some I/O standard interfaces.

PART-B

1. Describe the functions of a typical parallel I/O interface with a neat diagram
2. Explain high speed I/O interfacing in detail *
3. Write short notes on
i   Analog to digital converter
ii   UART *
4. Explain the functions of various buses used during transfer *
5. Explain the synchronous and asynchronous communications from serial devices

6. Explain the various timer and counting devices
7. Explain the various bus structures used in embedded systems
8. Explain the sophisticated interfacing features in devices /ports
9. Explain the classification of IO devices.
10. Explain the working of timers and counters in detail.
11. Explain the serial communication using I2C, CAN, USB in detail.
12. i Explain the parallel port devices. 8
ii Explain the sophisticated interfacing features in device ports.

UNIT-III
PART-A
1. What are the advantages of Assembly language?
2. What are advantages of high level languages?
3. Define In -line assembly
4. Mention the elements of C program.
5. What is the use of MACRO function?
6. What is the use of interrupt service routines or device drivers?
7. What are the data types available in C language?
8. Mention the data structures available in C language.
9. Explain pass by values.
10. What are the three conditions that must be satisfied by the re-entrant function?
11. Explain pass by reference.
12. Write the syntax for function pointer.
13. Define queue.
14. Define stack.
15. Define List.
16. What is Object oriented programming?
17. What are the advantages of OOPs?
18. What are the characteristics of OOPs?
19. Define Class.
20. Define NULL function.
21. What is Multiple Inheritances?
22. What is a Preprocessor Directive?

PART-B
1. i Tabu late program elements: Macros and Functions and their uses.
8 ii Explain the use of pointers, NULL pointers 8
2. i Explain the multiple function calls in the cyclic order in the main. Also write the
advantages of building ISR queues. Explain 8
ii Ex plain the 'C' program compiler and cross compiler. 8
3. i Explain the optimization of memory codes. 8
ii Explain the Embedded programming in C++. 8
4. Explain the function pointers, function queues and ISR queues. 16

PART-A

1. Define process.
2. Define task and Task state.
3. Define TCB
4. What is a thread?
5. What are the benefits of multithreaded programming?
6. Compare user threads and kernel threads.
7. Define RTOS.
8. Define task and task rates.
9. Define Synchronization.
10. Define Inter process communication.
11. Define Semaphore.
12. What is a semaphore?
13. Give the semaphore related functions.
14. When the error will occur when we use the semaphore?
15. Differentiate counting semaphore and binary semaphore.
16. What is priority inheritance?
17. Define Message Queue.
18. Define Mailbox and Pipe.
19. Define Socket.
20. Define Remote Procedure Call.
21. Define thread cancellation & target thread.
22. What are the different ways in which a thread can be cancelled?
23. What is preemptive and non-preemptive scheduling?
24. What is a Dispatcher?
25. What is dispatch latency?
26. What are the various scheduling criteria for CPU scheduling?
27. Define throughput?

PART-B

1. Explain how thread and process are used in embedded system.
2. Explain process management and memory management in embedded system
3. Explain file system organization and implementation
4. Explain how interrupt routines handled in embedded system
5. Explain the real time operating systems
6. Explain cyclic scheduling with time slicing
7. Explain how critical section in handled by a pre-emptive scheduler
8. Explain interprocess communication and synchronization
9. Explain interprocess communications using signals
10. Explain remote procedure call with an example
11. Write about IPC in detail.

UNIT-V
PART-A
1. Name any two important RTOS.
2. What is sophisticated multitasking embedded system?
3. Explain multi task and their functions in embedded system.
4. Give the function for sending a queue.
5. Give the steps to destroy a message queue.
6. Give the needs for memory management.
7. Name some application for the VxWorks RTOS.
8. What are the various features of VxWorks?
9. What are the basic functions of VxWorks?
10. What are the task service functions supported by VxWorks?
11. What are the different types of semaphores in vxworks? Which is the fastest?
12. Name any four interrupt service functions supported by Vx Works?
13. What is signal servicing function?
14. Define Micro C/OSII.
15. What are the task states in MICRO C/OS-II?
16. What are the 2 source files in Micro C/OS-II?
17. What are the basic functions of MUCOS?

PART-B
1. Explain detail about Memory allocation related functions
2. Explain briefly about mailbox related functions
3. Explain Queue related functions
4. Explain multiple tasks and their functions
5. Give the steps for creating list of tasks
6. Give the exemplary coding techniques
7. List and explain the various task service functions in VxWorks/MUCOS-II.
8. Explain how IPCs are used in embedded system.
9. Explain the various multiple function calls in Embedded C
10. Write in detail about MUCOS and it's features with a suitable example.
11. Write in detail about VxWorks and it's features with a suitable example.
12. How will you design a application for Automatic Chocolate Vending Machine in detail. Write with design and code.

B.E/B.Tech DEGREE EXAMINATION, APRIL 2016.

Eighth Semester

Electronics and Communication Engineering

EC 2042/EC 801- EMBEDDED AND REAL TIME SYSTEMS

Regulation 2008)

Time: Three hours   Maximum: 100 marks

Answer ALL questions

PART A-10X2=20 marks

1. Differentiate top-down and bottom-up design.

2. List the function of ARM PROCESSOR in supervisor mode.

3. What is the bus protocols especially, the four-cycle handshake?

4. What is a date flow graph?

5. What are the major inter process communication mechanisms?

6. Define context switching.

7. List the OSI layers from lowest to highest level of abstraction.

8. What is a distributed embedded architecture?

9. What is a PDA?

10. What is a set-top box?

PART B-5X16=80 marks

11. a   Explain in detail the operation of ARM processor and coprocessor.   16)

Or

   b)   i With a simple system namely, a model train controller, how will you use
          the UML to model systems?   8

(ii) Explain the operation of the BL instruction, including the state of ARM registers before and after its operation. (4)

(iii) How do you return from an ARM procedure? (4)

12. (a) (i) Explain the component interfacing. (8)

(ii) Explain the memory devices. (8)

Or

(b) (i) Describe the basic compilation techniques. (8)

(ii) Explain the debugging process. (8)

13. (a) Explain the services of operating system in handling multiprocess scheduling and communication. (16)

Or

(b) Discuss the power management and optimization for processes. (16)

14. (a) Discuss about accelerator based embedded system and network based embedded systems. (16)

Or

(b) Explain networks for embedded systems and internet enabled embedded systems. (16)

15. (a) Write short note on the following: (8+8)

(i) Data compressor

(ii) Software modem

Or

(b) (i) Explain the FOSS tools for embedded system development. (8)

(ii) Explain in embedded hardware and software co-design. (8)

B.E/B.Tech DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Eighth Semester

Electronics and Communication Engineering

EC 2042/EC 801- EMBEDDED AND REAL TIME SYSTEMS

(Regulation 2008)

Time: Three hours   Maximum: 100 marks

Answer ALL questions

PART A-(10X2=20 marks)

1. Enumerate various issues in real time computing.

2. Write short notes on ARM processor.

3. What are CPU buses?

4. List out the various compilation techniques.

5. Define: processes.

6. What is context switching?

7. What do you mean by hardware accelerator?

8. State the advantages of network based design.

9. Write short notes on hardware and software co-design.

10. What are FOSS tools for embedded systems?

PART B-(5X16=80 marks)

11. (a) (i) Explain about the Embedded system design process with suitable diagrams. (10)

(ii) What are instructions set preliminaries?   (6)

Or

(b) (i) Discuss in detail about coprocessor.   (12)

(ii) What do you mean by CPU performance? (4)

12. (a) Describe about Memory devices with suitable examples. (16)

Or

(b) Discuss in detail about assembly and linking with examples. (16)

13. (a) Discuss in detail about multi tasks and multi processes. (16)

Or

(b) Explain about inter process communication mechanism withy neat sketch. (16)

14. (a) Discuss in detail about distributed embedded architecture with neat sketches. (16)

Or

(b) Explain in detail about networks for embedded systems with an example. (16)

15. (a) Discuss about data compressor in detail with suitable diagrams. (16)

Or

(b) Explain about Software modem with neat sketch. (16)

B.E/B.Tech DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Eighth Semester

Electronics and Communication Engineering

EC 2042/EC 801- EMBEDDED AND REAL TIME SYSTEMS

Regulation 2008)

Time: Three hours   Maximum: 100 marks

Answer ALL questions

PART A-10X2=20 marks

1. What is the purpose of supervisor mode?

2. State the function of coprocessor.

3. What do you mean by control bus in a CPU?

4. Can latches be used to construct input port? Justify.

5. Define: Multitasking.

6. Give any two properties of operating systems.

7. What are hardware accelerators?

8. State some of the networks dedicated for embedded systems.

9. What do you mean by co-design?

10. List out the advantages of set-top box.

PART B-5X16=80 marks

11. a   i   Draw the architecture of an ARM processor. Explain about the various blocks in detail.   16)

Or

b) i   How do you evaluate CPU performance?   6)

(ii) State and explain various Instruction sets preliminaries. (10)

12. (a) Explain memory system interface with CPU, with examples. (16)

Or

(b) (i) Discuss briefly about Assembly and Linking. (10)

(ii) What are program validation and testing? (6)

13. (a) Describe in detail about the scheduling policies with suitable examples. (16)

Or

(b) How to evaluate operating system performance? Explain. (16)

14. (a) Explain about accelerated system design with suitable diagrams . (16)

Or

(b) Discuss in detail about the distributed embedded architecture. (16)

15. (a) Describe in detail about the principle of operation of software modem. (16)

Or

(b) What are FOSS tools for embedded system development? Explain the tools in detail. (16)