

DipIETE – ET/CS

Time: 3 Hours

JUNE 2014

Max. Marks: 100

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.
- Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. Assembler is an

- (A) Software (B) Compiler
(C) Hardware (D) All of these

b. A driver controlling functions are

- (A) Initializing, Run and Stop
(B) Initialization, Calling ISR and Resetting the status flags
(C) Start, Run, Stop and Resume
(D) Both (A) & (B)

c. The RTOS includes

- (A) Device Drivers and a Device Manager
(B) A part and Compiler
(C) A part and Debugger
(D) Both (A) and (B)

d. The CACHE is usually designed using SRAM rather than DRAM because

- (A) Cost
(B) Performance
(C) Appears on the same chip as a processor
(D) Both (A) and (B)

e. A program that runs on one processor and executes the instructions of another processor is called

- (A) Distributed processor (B) Single-purpose processor
(C) Instruction-set Simulator (D) All of these

Code: DE67 / DC67

Subject: EMBEDDED SYSTEMS

- f. The Scheduling, Allocation and Binding are highly
- (A) Interdependent (B) Dependent
(C) Both (A) and (B) (D) None of these
- g. The advantages of Mask – Programmed ROM are
- (A) Density (B) Speed
(C) Low Write Ability (D) All of these
- h. In a fixed priority arbitration, each peripheral has a
- (A) Unique Rank (B) Set of Ranks
(C) Low ranked (D) High ranked
- i. A LCD driver function is
- (A) To excite the LCD dots (B) To excite the LCD characters
(C) To manage LCD action (D) None of these
- j. Components that are commonly used in embedded software
- (A) The State Machine (B) The Circular Buffer
(C) The Queue (D) All of these

**Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.**

- Q.2** a. Define Embedded System. Explain the performance design metric of an embedded system. (8)
- b. Compare Full Custom Design, Semi Custom Design and PLDs. (8)
- Q.3** a. What is the use of RTL components in combinational circuits? Explain important RTL components which are used in combinational circuits design. (8)
- b. Define Optimization. Explain optimization opportunities in a single-purpose processor. (8)
- Q.4** a. Define ASIP. Explain how it is different from general-purpose processors with one example. (8)
- b. Discuss the technical aspects of selecting a microprocessor for use in an embedded system. (8)

- Q.5** a. What is a timer? How does a counter perform:
(i) Timer function
(ii) Prefixed time initiated event generation
(iii) Time capture function (8)
- b. A watchdog timer uses two cascaded 16 bit up-counter is connected to an 11.981 MHz oscillator. A time out should occur if the function watch reset is not called within 5 minutes. What value should be loaded into the up counter pair when the function is called? (8)
- Q.6** a. Discuss all the steps used in peripheral to memory transfer without DMA, using vectored interrupt. (6)
- b. Draw the block diagram of memory hierarchy structure used in an embedded system. (10)
- Q.7** a. Explain the function of scheduler in detail. (8)
- b. Explain Daisy Chain arbitration and Network oriented arbitration. (8)
- Q.8** a. Explain the Process and Task concepts in RTOS. (8)
- b. Explain in brief, comparison of the methods for Inter-task communication. (8)
- Q.9** a. Draw the software architecture of an automatic chocolate vending machine (ACVM). (8)
- b. Draw and explain state diagram for ACVM tasks. (8)