ROLL NO. _____

Code: DE67 / DC67 **Subject: EMBEDDED SYSTE**

DipIETE – ET/CS

Time: 3 Hours **DECEMBER 2013** **Max. Marks: 10**

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. An embedded system must have

(A) Hard disk
(B) Processor and memory
(C) Operating system
(D) Processor and input-output unit(s)

b. An embedded system has RAM memory

(A) for storing the variables during program run, stack and input or output buffers, for example, for speech or image
(B) for storing all the instructions and data
(C) for storing the programs from external secondary memory
(D) for fetching instructions and data into cache(s)

c. A cross compiler is used to

(A) Convert high level language code to assemble code
(B) Convert one high level language to a different high level language
(C) Compile code for a target CPU that is different from the development CPU
(D) Combine both high level language and assembler into a single module**)**

d. A "watch-dog timer" enables the implementation of real-time systems by providing

(A) a timer used by dog breeders to train police dogs
(B) a regularly timed interrupt for starting real time tasks
(C) a very flexible interrupt which is set for individual, critical real time tasks
(D) a mechanism for the safe shut down of system if any task takes too long to complete.

e. Type of RAM that is NOT temporary is _____.

(A) virtual memory **(B)** Flash RAM
(C) cache memory **(D)** virtual and cache memory

f. ROM is type of _____.

(A) semiconductor **(B)** slot
(C) adapter **(D)** firmware

g. RTOS is used in most embedded systems when the system does

(A) Concurrent processing of multiple real time processes
(B) sequential processing of multiple processes when the tasks have real time constraints
(C) real time processing of multiple processes
(D) the concurrent processing of multiple processes, tasks have real time constraints and deadlines, and high priority task pre-empts low priority task as per the real time constraints

h. A device driver is software for

(A) opening or connecting or binding or reading or writing or closing or other actions of the device
(B) receiving input or sending outputs from device
(C) access to parallel or serial port by the device
(D) controlling and configuring the device for read and write functions

i. Sophisticated embedded systems development requires

(A) IPs and several ASIPs
(B) IPs and several ASIPs, and hardware-software co-design
(C) multi-core processors
(D) system on chip with large memory

j. Communication protocol specifies

(A) the ways of communication of signals on the bus
(B) ways of arbitration when several devices need to communicate through the bus or the ways of polling from the devices need of the bus at an instance
(C) memory requirement during communication
(D) minimum rate of data transfer during communication

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

Q.2 a. Explain in detail the Processor technology? **(8)**

b. Compare Processor Technology with IC technology, give three examples. **(8)**

Q.3 a. What is the combinational logic?

b. Explain optimizing of data path & FSM **(8)**

Q.4 a. Explain in detail with the help of diagram processor architecture. **(8)**

b. What is the selection criteria for microprocessors? **(8)**

Q.5 a. Explain the working of watch dog timers. **(8)**

b. What are the LCD controllers? **(8)**

Q.6 a. What are the common memory types? Explain in detail. **(8)**

b. Explain with the help of diagram the concept of cache memory. **(8)**

Q.7 a. Difference between serial and parallel protocols. **(8)**

b. Explain with the help of diagram Direct Memory Access. **(8)**

Q.8 a. Explain the task states in RTOS with the help of two examples. **(8)**

b. Write short notes on semaphores and shared data. **(8)**

Q.9 Discuss the case study for sending application layer byte streams on a TCP/IP network using RTOS Vx works. **(16)**