ROLL NO. _____

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

DipIETE – ET/CS (Current Scheme)

Time: 3 Hours **JUNE 2015** **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. The processor technology relates to the architecture of the

(A) Memory Blocks **(B)** Computation Engine
(C) I/O Blocks **(D)** All of these

b. Identify which of these are real time applications scenarios

(A) An online bus ticketing system
(B) Printing of annual reports of a company
(C) Reconciling a days transactions in an account book of a company
(D) Examination system

c. Which of the following are commercially claimed RTOS

(A) LINUX **(B)** WINDOW 7
(C) WINDOW 2000 **(D)** Vx Works

d. Advantages of mask-programmed ROM are

(A) Density **(B)** Speed
(C) Low write ability **(D)** All of these

e. The I^2C and CAN bus protocols are designed for

(A) Interfacing IC's **(B)** Interfacing Buses
(C) Interfacing I/O's **(D)** All of these

f. An/A _____ routine must not call any RTOS function that might block the caller.

(A) Timer **(B)** Serial Communications
(C) I/O **(D)** Interrupt

g. The DMA is useful for

(A) Large and fast date transfer between memory and I/O devices
(B) Large and slow data transfer between memory and I/O device
(C) Slow and small data transfer between memory and I/O devices
(D) Small data transfer between memory and cache

h. A LCD driver function is

(A) to excite the LCD dots **(B)** to excite the LCD characters
(C) to manage LCD action **(D)** Both **(A)** & **(B)**

i. In a timer, the minimum interval it measures is called

(A) Sensitivity **(B)** Accuracy
(C) Resolutions **(D)** Both **(A)** & **(B)**

j. Running, ready and blocks are connected to

(A) Task state **(B)** Semaphore state
(C) Mailbox state **(D)** Pipe state

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

Q.2 a. Explain the main characteristics of an embedded system. Define the main design technology. **(8)**

b. Explain the design matrix for embedded systems. **(8)**

Q.3 a. Explain the following: **(8)**
(i) Combinational and sequential circuits
(ii) Function of Single purpose processors

b. Explain with the help of figure RT level Single purpose processor design. **(8)**

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

b. Write selection criterion of microcontroller. **(8)**

Q.5 a. What are LCD controllers? **(8)**

b. Discuss the main features of times, counters and watch dog timers. **(8)**

Q.6 a. Explain common memory types in detail. **(8)**

b. Explain the main features of ROM and draw internal view of 8×4 ROM. **(8)**

Q.7 a. Explain direct memory access with the help of suitable diagram. **(8)**

b. Explain basic protocol concepts. With the help of suitable diagram, explain strobe and handshake protocol control methods. **(8)**

Q.8 a. Discuss the task states in RTOS. **(8)**

b. Explain shared data problem and Re-entrant functions in RTOS. **(8)**

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