ROLL NO. _____

Code: DE67/DC67/DE115/DC121 **Subject: EMBEDDED SYSTEMS**

DipIETE – ET/CS (Current & New Scheme)

Time: 3 Hours **December 2016** **Max. Marks: 100**

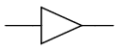
PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

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. Harvard Architecture is based upon
(A) RISC **(B)** CISC
(C) TISC **(D)** FISC

b. Symbol  is for
(A) Inverter Gate **(B)** AND Gate
(C) Driver or buffer Gate **(D)** Diode

c. ASIP stands for
(A) Applied specific Instruction Program
(B) Absolute specific Instruction Program
(C) Application specific Instruction Program
(D) None of these

d. Watch dog is a/an _____ .
(A) Interrupt **(B)** Memory
(C) Operating System **(D)** Timer

e. VRAM stands for
(A) Volatile RAM **(B)** Video RAM
(C) Versatile RAM **(D)** Vast RAM

f. Program memory is
(A) ROM **(B)** RAM
(C) Static RAM **(D)** All of these

g. Stack Pointer works on
(A) LIFO **(B)** FIFO
(C) PIPO **(D)** None of these

h. Convert Decimal $(16)_D$ to Hexadecimal $(\quad)_H$
(A) F **(B)** E
(C) 11 **(D)** 10

i. Term 'Mutex' is related to

(A) Task **(B)** State
(C) Semaphores **(D)** RTOS

j. IDE platform for VxWorks is

(A) Tornado **(B)** PSOS
(C) VRTX **(D)** All of these

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

Q.2 a. What is an embedded system? Explain with suitable example. **(8)**

b. Explain the different processors and IC's technology involved for embedded application. **(8)**

Q.3 a. Explain optimization of custom single purpose processors. **(8)**

b. Four lights are connected to a decoder. Build a circuit that will blink the lights in the following order: 0, 2, 1, 3, 0, 2, ...Start from a state diagram, draw the state table, minimize the logic. **(8)**

Q.4 a. What is the criteria to select a processor for an embedded system? **(8)**

b. Explain the pipeline concept with the help of an example. **(8)**

Q.5 a. What do you mean by PWM? Explain the application based upon PWM method **(8)**

b. Given below an analog output signal where voltage should range from 0 to 10 volt and an 8- bit digital encoding is used. Provide the encoding for following values:
(i) 1.5 volt (ii) 5.33 volt
(iii) 10 volt (iv) What is resolution of our conversion **(8)**

Q.6 a. Explain the memory hierarchy and also write short note on cache memory. **(8)**

b. What is RAM? Draw internal view of 4×3 RAM. **(8)**

Q.7 a. What is an Interrupt and write its importance? **(8)**

b. Write a note on Multi-level bus architecture. **(8)**

Q.8 a. What do you understand by Semaphore? Write and explain semaphore for RTOS. **(8)**

b. Explain the terms Process and Process scheduling. **(8)**

Q.9 a. Discuss a case study for an adaptive cruise control system in a car. **(16)**