

**DiplETE – ET/CS (Current Scheme)**

Time: 3 Hours

**DECEMBER 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. An embedded systems are found in
 

(A) Automobiles	(B) home appliances
(C) Business equipment	(D) All of these
- b. The NAND gate output will be low if the two inputs are
 

(A) 0 0	(B) 0 1
(C) 1 0	(D) 1 1
- c. Address size
 

(A) determines the number of directly accessible memory locations	(B) it is independent of data word size
(C) Both (A) and (B)	(D) None of these
- d. UART
 

(A) receives serial data and transmit serial data	(B) receives serial data and transmit parallel data
(C) receives parallel data and transmit serial data	(D) receives parallel data and transmit parallel data
- e. Which of the following is true with respect to EEPROM?
 

(A) contents can be erased byte wise only	(B) contents of full memory can be erased together
(C) contents can be erased using ultra violet rays	(D) contents can not be erased
- f. Resolution of a DAC is defined as
 

(A) $V_{\max} / (2^n + 1)$	(B) $V_{\max} / (2^n - 1)$
(C) $V_{\min} / (2^n + 1)$	(D) $V_{\min} / (2^n - 1)$
- g. A system bus is set of pins consisting of
 

(A) address pins	(B) data pins
(C) control pins	(D) All of these

- h. A special variable operated by the OS function is  
 (A) RTOS (B) semaphore  
 (C) task state (D) deadlock
- i. Round - robin deals with  
 (A) rotating priority (B) fixed priority  
 (C) Both (A) and (B) (D) None of these
- j. In an embedded system device means\_\_\_\_\_  
 (A) A non-programmable peripheral IO or memory or memory system interfaced to the microcontroller  
 (B) ADC, timer, serial port and IO ports with the control, status and data registers  
 (C) A microcontroller or peripheral IO or memory or memory system for a particular purpose or part of the application  
 (D) None of these

**Answer any FIVE Questions out of EIGHT Questions.**

**Each question carries 16 marks.**

- Q.2** a. Discuss design challenges –optimizing design matrices in detail. (8)  
 b. Discuss:  
 (i) General purpose processor  
 (ii) Single Purpose processors (8)
- Q.3** a. For the following data develop a combinational logic design.  
 “y is 1 if a is equal to 1, or b and c is equal to 1. z is 1 if b or c is equal to 1, but not both”. (10)  
 b. (i) What is the difference between a sequential circuit and ac combinational circuit? (3)  
 (ii) Enlist various steps involved in designing a custom single-purpose processor. (3)
- Q.4** a. Explain in detail with the operation of a general purpose processor. (8)  
 b. Explain the following:  
 (i) ALU (ii) Registers  
 (iii) I/O (iv) Interrupts (8)
- Q.5** a. Explain the working of UART. (8)  
 b. What are the key pad controller? (8)
- Q.6** a. Compare ROM and RAM memories for various aspects. (8)  
 b. Explain with the help of diagram the concept of composing memory. (8)
- Q.7** a. Discuss utility of arbitration in interfacing. (8)  
 b. Explain the basic concepts of communication protocols with example. (8)
- Q.8** a. Explain the task in RTOS with the help of two examples. (8)  
 b. Write short notes on shared data. (8)
- Q.9** Discuss the case study of an embedded system for an adaptive cruise control system in a car. (16)