

No. of Printed Pages : 03

Roll No. ....

**BB-762**

**M. Tech. EXAMINATION, May 2018**

(Second Semester)

(B. Scheme) (Main & Re-appear)

ECE(VLSI)

MTVLSI504

ESD USING AVR MICROCONTROLLER

*Time : 3 Hours]*

*[Maximum Marks : 75*

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Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

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**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

(2-20/14) M-BB-762

**P.T.O.**

### **Unit I**

1. Define the terms microcontroller, embedded microcontroller and external memory microcontroller. Briefly describe various challenges of embedded system design. **15**
2. (a) Differentiate between Harvard and Princeton processors. **7**  
(b) Discuss the role and significance of various features of Microcontroller particularly clocking, timers and interrupts. **8**

### **Unit II**

3. Briefly explain the following using examples :  
(i) High level language in embedded system  
(ii) Debugging. **8+7**
4. Discuss the concept of Intel hex format object files and an Interpreter in embedded system design. **15**

### **Unit III**

5. Define the terms addressing mode and pipelining. Also, draw architecture of AVR microcontroller and explain its programming model in detail. **15**
6. Briefly describe the following w.r.t. AVR microcontroller : **8+7**  
(i) Generation of waveforms using interrupt  
(ii) Watch-dog timer and control word.

### **Unit IV**

7. Using an example, describe interfacing of AVR microcontroller with other devices using parallel communication. **15**
8. Write short notes on the following :  
(i) I2C protocol  
(ii) DC motor controller using PWM. **7+8**