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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR****(AUTONOMOUS)****B.Tech IV Year I Semester Supplementary Examinations February-2022****EMBEDDED SYSTEMS****(Electronics and Communication Engineering)**

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

**UNIT-I**

- 1 a Define embedded system. 2M  
 b Explain the different classifications of embedded systems. Give an example for each. 10M

**OR**

- 2 a Describe the role of the following in an embedded system i) Timers ii) Clocks 6M  
 iii) Address bus & Data bus.  
 b List various applications of embedded systems. 6M

**UNIT-II**

- 3 a Define Processor Architecture. 2M  
 b Describe the different processor architectures available for processor or controller design with an example for each. 10M

**OR**

- 4 a What is a Actuator? Explain the role of an actuator in embedded system design. 3M  
 b With a neat sketch, describe the principle of operation of the following devices 9M  
 i) Stepper Motor ii) Relay

**UNIT-III**

- 5 a Write a short note on pin multiplexing. 2M  
 b With neat sketch, explain pin functionality of ATmega328/P  $\mu$ C 10M

**OR**

- 6 a With the help of neat block diagram, describe the structure of Arduino UNO board. 8M  
 b Explain in brief about the Arduino platform. 4M

**UNIT-IV**

- 7 With an example each, explain the following functions in Arduino programming. 12M  
 (i) Digital I/O (ii) Analog I/O (iii) Advanced I/O

**OR**

- 8 Explain following elements of Arduino programming with an example (i) Interrupts (ii) External interrupts (iii) Communication (iv) USB 12M

**UNIT-V**

- 9 a Write a short note on IP address. 2M  
 b Describe the common challenges faced while implementing IoT. 10M

**OR**

- 10 Explain the following i) TCP and UDP ports ii) MAC address 12M

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