UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2018

Course: Embedded systems   **Semester: 1st**
Programme:M.tech (ARE)
Time: 03 hrs.   **Max. Marks: 100**
Instructions:answer all questions in section A and B and any two from section C

SECTION A

S. No.		Marks	CO
Q 1	What is Arduino? How does it work?	5	CO1
Q2	What is interrupt latency? How can it be reduced?	5	CO1
Q3	List out the various uses of timers in embedded system.	5	CO1
Q4	What is the difference between mutexes and semaphores?	5	CO2

SECTION B

Q 5	What are the addressing modes of ARM processor? Explain with the help of Example	10	CO3
Q6	Write an ARM program to expand an array of signed half words into an array of words	10	CO3,CO4
Q7	How does RTOS offer solution for inter task communication and synchronization between tasks?	10	CO2,CO4
Q8	Show a scheme for interfacing a dc motor with Atmega 32 microcontroller	10	CO3,CO4

SECTION-C

Q 9	Design a Real time operating system consisting of three switches , three motors , one pressure gauge and a valve so that when the switches are turned on or off, it is scanned 10 times per second and accordingly three motors are switched on or off, pressure gauge is checked every 50 millisecond and if pressure exceeds 100 psi, the valve is opened and is closed if the pressure dips to below 90psi. . If the system is connected to a network , how will you take care of the incoming datagram?	20	CO2,CO4
Q10	Explain the function of Atmega 16/32 development board with detailed pin diagram. Design an interfacing circuit for interfacing a Servomotor with Atmega 32 microcontroller.the design should include the detailed circuit diagram and driver code	20	CO3,CO4
Q11	With the help of circuit diagram and driver code , design an interfacing circuit for	20	CO3,C

	interfacing soil moisture sensor and finger print sensor with Atmega 32 microcontroller.		**O4**

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2018

Course: Embedded systems   **Semester: 1st**
Programme:M.Tech(ARE)
Time: 03 hrs.   **Max. Marks: 100**
Instructions: answer all questions in section A and B and any two from section C

SECTION A			
S. No.		**Marks**	**CO**
Q 1	What are the buses used for communication in embedded system?	**5**	**CO1**
Q2	Explain what is a watch dog timer in embedded system.	**5**	**CO1**
Q3	List out some of the commonly found errors in the embedded system	**5**	**CO2**
Q4	Explain what is semaphore.	**5**	**CO2**
SECTION B			
Q 5	Explain in detain architecture and organization of ARM processor. What is the difference between ARM and Berkeley RISC architecture?	**10**	**CO3**
Q6	Write a subroutine to output a text "hello world" using ARM processor. Finish executing the subroutine and return to the monitor.	**10**	**CO4**
Q7	How task scheduling is done by the kernel of the Real time operating system?	**10**	**CO4**
Q8	Show a scheme for interfacing 16x2 LCD display with Atmega 32	**10**	**CO2,CO3**
SECTION-C			
Q 9	Design a Real time operating system consisting of three switches , three motors , one pressure gauge and a valve so that when the switches are turned on or off, it is scanned 10 times per second and accordingly three motors are switched on or off, pressure gauge is checked every 50 millisecond and if pressure exceeds 100 psi, the	**20**	**CO2,CO4**

	valve is opened and is closed if the pressure dips to below 90psi. . If the system is connected to a network , how will you take care of the incoming datagram?		
Q10	Design an interfacing circuit with detailed circuit diagram the interfacing of DC motor and 16x2 LCD with ATmega 32 microcontroller.	**20**	**CO2.CO3**
Q11	Design an interfacing circuit for interfacing gas sensor and temperature sensor with Atmega 32 microcontroller. The detailed circuit diagram and driver code must be clearly explained.	**20**	**CO2,CO3**