Roll No: ----------

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2018

Program: B.Tech ASE+AVE | **Semester – IV**
Subject (Course): Microcontrollers and Embedded Systems | **Max. Marks : 100**
Course Code : ELEG 368 | **Duration : 3 Hrs**
No. of page/s: 02

Section A (Attempt ALL questions) (5X4M =20 Marks)			
		Marks	Course Objective
1.	Compute the following: a. Add 110111010 and 101101111 b. 2's complement of 11001001	**4**	**CO1**
2.	Elaborate about the following files created during the assembling and running an 8051 program a. .asm b. .lst c. .obj d. .abs e. .hex	**4**	**CO1**
3	Draw and explain the pin diagram of 8051 Micro controller. Elaborate in detail the I/O port pins and their functions also the dual role of port 0 and 2	**4**	**CO2**
4	Draw and explain all the components in a 5V power supply diagram, which is used to power on the 8051 Microcontroller.	**4**	**CO1**

5	Show the contents of flag register after the execution of following instructions
	MOV A, #0BFH
	ADD A, #1BH
		4	**CO3**

Section B (Attempt ALL questions) (4X10M =40 Marks)			
6	Explain in detail the LCD interfacing with 8051 Microcontroller. Elaborate in detail the usage of each and every pin of 16X2 LCD. Write a program to communicate with LCD with time delay.	**10**	**CO5**

7	Find step size for ADC, if V_{ref} = 5V, Calculate the first D0-D7 output if the analog input is: a) 0.99V and b) 2V.	**10**	**CO5**
8	LEDs are connected to P1 and P2. Write a 8051 C program that shows the count from 0-FF on the LEDs OR Elaborate the three factors, that can affect the accuracy of the delay that must be considered in creating a time delay using a for loop.	**10**	**CO4**
9	Compilers produce hex files that are downloaded into ROM. Discuss why the size of the hex file produced by the compiler is one of the main concerns of microcontroller programmers ad how the choice of programming language affect the compiled program size?	**10**	**CO3**
	Section B (Attempt ALL questions) (2X20M =40 Marks)		
10	Using the timers of 8051, write Assembly language program for the following a. Generate a square wave with an ON time of 3ms and an OFF time of 10ms on all pins of Port 0. Assume XTAL of 22 MHz. b. Assuming that XTAL = 22 MHz, write a program to generate a square wave of frequency 1KHz on pin P1.2.	**20**	**CO4**
11	In serial communication of 8051 Microcontroller explain the following a. Half duplex and full duplex transmission b. Framing of ASCII "A" c. Explain all the registers associated with serial port programming in 8051 OR Analyze and justify the following statements in serial communication with suitable real-time examples: a. Serial communication is always preferred over parallel communication b. Show the framing of the letter ASCII "Z" (0101 1010), no parity, 1 stop bit c. Show the connections of TxD and RxD pins of 8051 to PC via MAX232.	**20**	**CO5**

Roll No: ----------

UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2018

Program: B.Tech ASE+AVE | **Semester – IV**
Subject (Course): Microcontrollers and Embedded Systems | **Max. Marks : 100**
Course Code : ELEG 368 | **Duration : 3 Hrs**
No. of page/s: 02

Section A (Attempt ALL questions) (5X4M =20 Marks)			
		Marks	Course Objective
1	Compute the following a. Add 11011010 and 100101111 b. 2's complement of 110001001	**4**	**CO2**
2	What are the most widely used registers in 8051 microcontroller? Write instructions to move the value 67H in register A and value 44H in register B, add them together and store the result in register R7.	**4**	**CO1**

3	Generate the List file for following program
	MOV R5, #25H
	MOV R7, #34H
	MOV A, #0
	ADD A, R5
	ADD A, R7
	ADD A, #12H
		4	**CO2**

4	Write an 8051 C program to send value of -4 to +4 to PORT P1	**4**	**CO4**
5	With respect to PIN diagram of 8051 answer the following a. 8051 DIP package is a _____ Package b. What are the functions of pins 20 and 40 c. The crystal oscillator is connected to pins ____ and ___ d. Indicate the pin number assigned to RST in DIP package e. What are the contents of PC upon RESET of 8051? f. In 8051, which port needs a pull-up resistor to be used as I/O g. Why Pin 31 is connected to VCC for the system h. What is obtained in the hex file?	**4**	**CO3**

Section B (Attempt ALL questions) (4X10M =40 Marks)			
6	Explain Interfacing of 8051 trainer kit with PC using MAX 232	**10**	**CO3**
7	Find step size for ADC, if Vref = 2V, Calculate the first D0-D9 output if the analog input is: a) 0.7V and b) 1V.	**10**	**CO5**
8	Write a program to toggle all the bits of P1 and P2 continuously Using AAH and 55H OR Write a program to toggle all the bits of P1 and P2 continuously CPL Instruction	**10**	**CO4**
9	A door sensor is connected to the P1.1 pin, and a buzzer is connected to P1.7. write an 8051 C program to monitor the door sensor, and when it opens, sound the buzzer. You can sound buzzer by sending a square wave of few hundred HZ.	**10**	**CO4**
Section B (Attempt ALL questions) (2X20M =40 Marks)			
10	What are the two timers in 8051 Microcontroller, explain in detail all the registers (including bits) associated with both the timers. What are the different modes the timers of 8051 work on? Discuss in detail MODE 1 and MODE 2 programming (OR) Design a counter for counting the pulses of an input signal. The pulses to be counted are fed to P3.4. XTAL = 22 MHz	**20**	**CO4**
11	Write down all the steps to transfer character bytes serially. Calculate the TMOD, SCON and TH1 values for 11.0592 MHz Crystal.	**20**	**CO5**