Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Semester: VI Electrical Engineering

Regular Examination April – June 2016

2EE601: Microcontroller & Embedded System

Time: 3 Hours **Total Marks: 70**

Instruction: 1 This Question paper has two sections. Attempt each section in separate answer book.
2 Figures on right indicate marks.
3 Be precise and to the point in answering the descriptive questions.

Section - I

Que. – 1	(A)	Explain the common 8051 data types and directives.	5
	(B)	What is the bit structure of 8051 Program Status Word (PSW) register?	3
	(C)	Write an assembly language program to add the first ten natural numbers.	4

OR

Que. – 1	(A)	Write a program to copy the value 55H into RAM memory locations 40H 45H using register indirect addressing mode.	4
	(B)	Write a program to save the accumulator in R7 of bank 2.	2
	(C)	In a semester student has to take six courses. The marks of the student (out of 25) are stored in RAM locations 47H onwards. Find the average marks, and output it on port 1.	6
Que. – 2	(A)	Write an 8051 C program to send hex values for ASCII characters of 0, 1, 2, 3, 4, 5, A, B, C, and D to port P1.	5
	(B)	Explain simplex, half-duplex and full duplex communications with suitable example.	6

OR

Que. – 2	(A)	Write an 8051 C program to toggle all the bits of P0, P1, and P2 continuously with a certain time delay. Use the Ex-OR operator.	6
	(B)	Write an 8051 C program that continuously gets a single bit of data from P1.7 and sends it to P1.0, while simultaneously creating a square wave of 200 micro-second period on pin P2.5. Use timer 0 to create the square wave. Assume that XTAL = 11.0592 MHz.	5
Que. – 3	**Attempt any two.**		
	(A)	What is the importance of checksum byte in ROM? Explain with example.	6
	(B)	Assuming XTAL = 22 MHz, write a program to generate a pulse train of 2 seconds period on pin P2.4. Use Timer 1 in mode 1.	6
	(C)	What are the advantages of 8051 C programs over assembly language program? Explain in detail.	6

Section – II

Que. – 4	(A)	Explain the features of 8051 Microcontroller Hardware briefly with block diagram.	6
	(B)	Explain special function register - TCON and TMOD with timer/counter control logic in detail.	6

OR

Que. – 4	(A)	Explain the internal memory - RAM and ROM organization of 8051 Microcontroller in detail.	6
	(B)	Explain different serial communication operating modes in 8051 Microcontroller.	6
Que. – 5	(A)	Explain with the circuit diagram, how to interface 7-segment LED with 8051 microcontroller. Also derive the digit drive pattern for 0 to 9 digits.	5
	(B)	Draw and explain the circuit diagram for interfacing LCD with 8051 microcontroller.	6

OR

Que. – 5	(A)	Write an 8051 Assembly language program to display "UVPCE" on LCD using delays. (Consider necessary assumptions)	5
	(B)	Explain the concept of interfacing 8051 microcontroller with Keyboard. (Consider 4×4 matrix keyboard)	6
Que. – 6	**Attempt any two**		
	(A)	Write an 8051 C program to transfer the letter "A" serially at 4800 baud continuously.	6
	(B)	Explain the applications of embedded systems in daily life.	6
	(C)	Assume that register A has packed BCD. Write a program to convert packed BCD to two ASCII numbers and place them in R2 and R6.	6

END OF PAPER