

GANPAT UNIVERSITY

B. Tech. Semester: VII Electrical Engineering
Regular Examination November – December 2014

2EE 723: ADVANCED MICROCONTROLLERS

Time: 3 Hours

Total Marks: 70

- INSTRUCTIONS:**
1. Attempt all questions.
 2. Make suitable assumptions wherever necessary.
 3. Figures to the right indicate full marks.
 4. The programs must be in structured format and must contain the proper comments.
Programs without appropriate comments would not deserve full marks.

Section - I

- Que. – 1**
- A. Explain the concept of I2C communication with its protocol and schematic diagram. 6
 - B. Compare the I2C & SPI communication techniques. 6
- OR**
- Que. – 1**
- A. Discuss the interfacing of an EEPROM with C8051F120 via I2C bus. 6
 - B. What is an Operating System (OS)? How a Real Time Operating System (RTOS) is different from a general purpose OS? 6
- Que. – 2**
- A. What is a thread? How a scheduler in RTOS schedules threads execution while multitasking? 6
 - B. What is a task in an RTOS and what are the task states? 5
- OR**
- Que. – 2**
- Write a subroutine to perform keypad scanning & de-bouncing of a 4X4 matrix keyboard and return the ASCII code of the pressed key. 11
- Que. – 3**
- A. Five push-button keys are connected to Port 4 of a C8051F120 demo board. Write a program to glow a corresponding LED connected to Port 5, whenever any key is pressed. 6
 - B. Write a program to display the binary count on 8 LEDs connected to P5 of a C8051F120 demo board; the count should increment at every transition on INT0 pin. 6

Section – II

Que. – 4

- A. Compare the characteristics of various software architectures. 6
- B. Describe the “Round-Robin with Interrupt” architecture with its prototype. 6

OR

Que. – 4

- A. Explain the memory organization of CIP51 microcontroller. 6
- B. With the help of schematic diagram explain the port I/O cell of a C8051F120 microcontroller. 6

Que. – 5

- A. Explain the auto reload mode of Timer 2 of a C8051F120 microcontroller with the help of block diagram. 6
- B. Write two functions that will select, the internal and external crystal oscillator to generate system clock, respectively in C8051F12X. 5

OR

Que. – 5

Write a C8051F120 microcontroller program to display a message on LCD. 11

Que. – 6

Attempt any two 12

- A. With the help of block diagram, explain any one mode of Programmable Counter Array (PCA) of C8051F120.
- B. Discuss some of the features of STM32F407xx microcontroller.
- C. Explain the bit banding technique used in STM32 microcontroller, with an example to calculate the alias address of any bit.

END OF PAPER