Z 6352

M.E. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2006.

Second Semester

Power Electronics and Drives

PE 1654 — EMBEDDED CONTROL OF ELECTRICAL DRIVES

(Regulation 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the innovative features in MC 68 HC 11 when compared to 8051 architecture.

2. Name four interrupts of 68 HC 11.

3. What is the function of parallel I/O control register (PIOC) in MC 68 HC 11?

4. Mention the operation of EPROM loader program in MC 68 HC 11.

5. Why is PIC program memory 14 bits wide?

6. What is the brown-out feature in PIC micro controllers?

7. What do you mean by the prescaling of PIC timers?

8. What are the various addressing modes in PIC microcontrollers?

9. What do you mean by the term 'contact debounce'?

10. When is it preferable to have isolation between a microcontroller and rest of the circuitry?

PART B — (5 × 16 = 80 marks)

11. (a) (i) List the addressing modes used in 68 HC 11 - MCU. Write two example instructions for each mode. (12)

(ii) Explain STOP and WAIT instructions. (4)

Or

(b) (i) List the 'config', 'option', 'init', port and timer control, mask and status registers in 68 HC 11. (8)

(ii) How do you map on-chip registers for direct addressing? Explain. (8)

12. (a) (i) Describe how the real time clock interrupts differ from software interrupts of 68 HC 11. (8)

(ii) List non-maskable and maskable interrupts in 68 HC 11. Draw a table of interrupt vectors according to hardware priority of each source group. (8)

Or

(b) (i) Describe the pulse accumulator in 68 HC 11. (8)

(ii) Explain the features of ADC in 68 HC 11. (8)

13. (a) (i) Explain what is instruction pipelining in PIC? (8)

(ii) How to PIC micro controllers support the power saving options? What are the various possibilities to come out of these modes? (8)

Or

(b) (i) What do you mean by 8-level program counter stack? How does the stack operate in the PIC micro controllers? (8)

(ii) What is the meaning of orthogonal instruction set? Is PIC instruction set orthogonal? (8)

14. (a) (i) Justify the statement "Once the watchdog timer is enabled (disabled), it is not possible to make it off (on)". (6)

(ii) List the interrupts supported by PIC 16 C7X and discuss them in brief. (10)

Or

(b) (i) Write a program to initialize the PORT B as an output port and PORT A as an input port with AIN 3 as an analog input and other input lines of PORT A as simple digital inputs. (12)

(ii) What are the registers associated with the operation of the A/D module? (4)

15. (a) (i) How is contact debouncing problem taken care while interfacing keyboard with a microcontroller? Discuss (8)

(ii) What is the difference between "polling the busy line" and "software delay" in LCD interfacing? Explain. (8)

Or

(b) (i) Explain the speed control of DC motor using PID controller. (8)

(ii) With a neat block diagram, explain the operation of brushless DC motor control using microcontroller. (8)
