

G 6422

M.E. DEGREE EXAMINATION, MAY/JUNE 2007.

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. What is inherent addressing?
2. Mention the function of compare force register.
3. What is the use of pulse accumulator counter?
4. What is meant by expanded mode?
5. What is the function of trace buffer in a PIC16C7X micro controller?
6. Distinguish between general purpose register file and special purpose register file in PIC16C7X microcontroller.
7. What is the watch dog timer feature in PIC microcontroller?
8. What is Synchronous Serial Port (SSP) module in PIC microcontroller?
9. What is a PID controller?
10. What is the bandwidth of most displays (both LEDs and LCDs) which is limited by the human visual processing system?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe the architecture of MC 68 HC 11 microcontroller. (8)
(ii) Describe branch, conditional branch, call and return instructions in 68 HC 11. (8)

Or

- (b) (i) Draw 68 HC 11 memory map. List its innovative map features with respect to the 8051 architecture. (8)
(ii) Compare and contrast the following with an illustration :
(1) Direct addressing
(2) Extended addressing
(3) Indexed addressing. (8)
12. (a) (i) Explain the process of initializing and accessing of I/O ports in 68 HC 11. (8)
(ii) What is a direction register? (4)
(iii) Why does the microcomputer have direction registers? (4)

Or

- (b) (i) Explain 68 HC 11 family real time clock interrupts. How do these differ from out compare interrupts programmed for periodic comparisons in 68 HC 11? (10)
(ii) Discuss the operation of serial peripheral interface. (6)
13. (a) (i) Explain the role of program counter in accessing program memory. (10)
(ii) Describe register file structure in PIC microcontroller. (6)

Or

- (b) Explain the nine groups of instructions with examples for a PIC microcontroller. (16)
14. (a) (i) With a timing diagram explain the relationship between the execution of mainline loop tasks and interrupt driven tasks. (10)
(ii) Explain PIC microcontroller interrupt logic. (6)

Or

(b) (i) Explain how a pulse width modulated output can be obtained from a PIC microcontroller. (10)

(ii) Describe about I²C typical message string formats of PIC microcontroller. (6)

15. (a) (i) Explain how AC load is controlled by a microcontroller based system. (6)

(ii) Explain programming and interface for an LCD display controller which has two lines and sixteen characters in each line. (10)

Or

(b) (i) Explain the operation and control of a stepper motor using microcontroller. (8)

(ii) Explain control of a DC motor current and direction using internal PWM in a microcontroller unit. (8)