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Question Paper Code : 81848

M.E. DEGREE EXAMINATION, JUNE 2012.

Second Semester

Power Electronics and Drives

PE 9224/235208/PE 924 — MICROCONTROLLER AND DSP BASED SYSTEM
DESIGN

(Common to M.E. Electrical Drives and Embedded Control)

(Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by direct addressing mode in PIC16C7X?
2. Write the operation carried out when the instruction movwf TRISB is executed by PIC16C7X.
3. How the timer O interrupt is enabled in PIC16C7X?
4. How the start of conversion command is given to on-chip ADC in PIC16C7X and how the end of conversion is known in the same?
5. With an example, indicate the accessing of memory operand using indirect addressing mode in motor control signal processor TMS320LF2407.
6. Write the operation carried out when the instruction LDP # OEOH is executed by TMS320LF2407 DSP.
7. What is the function of PADATDIR register in TMS320LF2407 DSP?
8. What are the different interrupts that are generated from a general purpose timer in TMSLF2407 DSP?
9. What is meant by park's transformation?
10. What is the advantage of space vector PWM over standard sinusoidal PWM?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the operation carried out when the following instructions are executed by PIC16C7X:
- (i) `bsf f, b`
 - (ii) `movlw k`
 - (iii) `clrf f`
 - (iv) `retfie`
 - (v) `clrwdt`
 - (vi) `dtfsc f, b`
 - (vii) `comf f, w`
 - (viii) `dec fsz f, w`

Where f is a file register, b is the bit number, K is a constant and w is the working register. (16)

Or

- (b) (i) Explain the program memory and data memory organization in PIC 16C7X. (8)
- (ii) Write the assembly language program for multiplying two 8-bit data in PIC 16C7X. (8)

12. (a) Explain the operation of Timer 0 and Timer 1 in PIC16C7X in detail with necessary diagrams. (16)

Or

- (b) Describe the transfer of data through I²C bus operating in master mode in PIC16C7X. (16)

13. (a) Explain the function of different bits in the system configuration registers of TMS 320LF2407 DSP. (16)

Or

- (b) (i) Describe the operation carried out during the execution of any four data transfer instructions in TMS 320 LF2407 DSP. (8)
- (ii) Write assembly language program to add ten 16-bit data stored in data memory successively starting from the address 3000H and store the result in address 4000H and 4001H in data memory. (8)

14. (a) Explain the interrupt structure in TMS 320LF2407 DSP in detail. (16)

Or

(b) Describe the generation of a symmetric PWM waveform and symmetric PWM waveform using event manager module in TMS320LF2407 DSP with necessary diagrams. (16)

15. (a) With necessary diagram, explain the speed control of DC motor using PIC16C7X microcontroller. (16)

Or

(b) Explain the speed control of induction motor using TMS320LF2407 DSP with necessary diagrams. (16)

