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6.12.13 FN

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Question Paper Code : 82112

M.E. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Second Semester

Power Electronics and Drives

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

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

(Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the functioning of a trace buffer in PIC?
2. Name the components of a register file.
3. List the models of Synchronous Serial Port (SSP).
4. Mention the pins that are used for multipurpose operations of I²C bus.
5. What are the elements of a CPU unit of DSP based signal processor?
6. What is the use of exponent modes of a DSP signal processor?
7. Define Host port interface.
8. Mention any two features of ADC.
9. What is space vector PWM?
10. What do mean by regenerative braking?

PART B — (5 × 16 = 80 marks)

11. (a) Explain in detail the program memory considerations of a PIC architecture.

Or

- (b) Explain the instruction sets of PIC.

12. (a) Explain the interrupt constraints and how the devices are improved by interrupts in the program.

Or

- (b) Explain about the UART, the waveforms, based rate accuracy, data-handling circuitry and interface to a PC.

13. (a) Explain the memory addressing modes of a signal processor.

Or

- (b) Explain the instruction set of any one DSP based signal processor.

14. (a) Explain the PWM generations of signal processor.

Or

- (b) Explain the A/D converter of a signal processor.

15. (a) Explain with suitable diagrams the operation of PIC based DC motor drive. Also discuss the constant torque and constant power modes of operations.

Or

- (b) Explain the PIC based V/f control of induction motor with relevant diagrams and enumerate its advances over other control schemes.