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C09–EE–405

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BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2015

DEEE—FOURTH SEMESTER EXAMINATION

DIGITAL ELECTRONICS AND MICROCONTROLLERS

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Convert octal 257·125 into decimal number system.

2. Draw the logic circuit of full-adder using gates and write its truth table.

3. Differentiate between flash ROM and NV RAM.

4. Draw the logic circuit of 4-bit shift right register.

5. Draw the pin diagram of 8051 microcontroller.

6. State the functions of the following :

(a) Data pointer

(b) Program counter

7. Explain SWAP A instruction with one example.

8. Explain any three data transfer group of instructions of 8051 microcontroller.

9. State the addressing mode of each of the following instructions :

(a) MOV A, #30 H

(b) MOV A, @R0

(c) SUBB A, 56 H

(d) MOVX A, @DPTR

(e) RR A

(f) ADD A, R1

10. Write an assembly language program to multiply two 8-bit numbers stored in the iRAM locations 40 H and 41 H. Store the result in 42 H and 43 H.

PART—B 10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. *(a)* Draw the logic circuit and explain half adder.

(b) State and explain De Morgan's theorems.

12. *(a)* Draw the logic circuit and explain the operation of 4 2 encoder.

(b) State the need for A/D and D/A converters.

13. Draw the circuit and explain the operation of master-slave JK flip-flop.

14. Draw the diagram and explain the working of 4-bit asynchronous counter with truth table and waveforms.

15. Describe the memory organization of 8051 microcontrollers.

16. *(a)* Explain the SBUF register.

(b) Draw and explain the bitwise description of PCON register.

17. *(a)* Distinguish between machine language and assembly language.

(b) Classify the 8051 instruction set as per their length with two examples of each.

18. Write an assembly language program along with comments to add two 8-bit numbers stored in the external memory locations 4500H and 4501H. Store the result at 4502H and 4503H.

★ ★ ★