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C09–EE–405

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BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2017

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. Explain 2's complement subtraction with an example.

2. What are the basic gates? Draw their symbols.

3. Draw the circuit of NAND latch and write its truth table.

4. List the different types of ROMs.

5. State the function of the following :

(a) Data pointer

(b) Program counter

6. What are the functions of the following 8051 pins?

(a) ALE

(b) $\overline{EA}$

(c) $\overline{PSEN}$

7. Explain SWAP A instruction with one example.

8. Define machine cycle and instruction cycle.

9. List the different addressing modes of 8051.

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 block diagram of serial adder and explain its working with an example.

(b) Compare the performance of serial adder and parallel adder.

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. *(a)* Briefly explain the data movement in the following registers with block diagrams :

(i) PISO

(ii) SIPO

(b) Explain the operation of 4-bit shift-right register with diagram.

14. Draw the diagram and explain the working of decade counter with truth table and waveforms.

15. *(a)* Draw and explain the bitwise description of PSW register.

(b) List the interrupts as per their priority and vectored addresses.

16. *(a)* Draw and explain the bitwise description of TMOD register.

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

17. *(a)* Explain RET and RETI instructions.

(b) Compare among LJMP, AJMP and SJMP instructions.

18. Write an assembly language program to divide the contents of memory location 2500 H by 2501 H. Store the result in 2502 H and remainder in 2503 H.

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