



C09-IT-304

3302

BOARD DIPLOMA EXAMINATION, (C-09)

OCT/NOV—2014

DIT—THIRD SEMESTER EXAMINATION

DIGITAL ELECTRONICS AND COMPUTER ARCHITECTURE

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. Define AND, OR and NOT operators with truth tables.
2. State the functions of half-adder.
3. State the basic principle of operation of a flip-flop.
4. State the use of shift register as memory.
5. List the applications of multiplexers.
6. Define the terms : Instruction cycle, fetch cycle and execution cycle.
7. Distinguish between fixed point representation and floating point representation of numbers.
8. Define operand, opcode and address.

- * 9. Explain the need for memory hierarchy in a computer.
10. List out the three modes of data transfer.

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 a 4-bit parallel adder/2's complement subtractor circuit. Explain the working of the above circuit.

(b) Simplify the following expression using K-map :

$$Y = \sum M(6, 8, 9, 11, 13, 14, 15)$$

12. Explain with block diagram, waveform and truth table the working of RST flip-flop.

13. Explain the operation of an up-down counter, using flip-flop.

14. (a) Draw and explain a 4-bit synchronous counter.

(b) Describe the operation of a 4 to 10-line decoder.

15. Draw the block diagram of a simple accumulator based CPU. Explain the function of each unit.

16. Explain fixed point addition and subtraction with the help of flowchart.

17. (a) Explain zero address and one address instructions with examples.

(b) Explain the principle and advantages of cache memory organization.

18. (a) Explain interrupt initiated I/O.

(b) Explain DMA controlled transfer.
