2013

Time : 3 hours

Full Marks : 80

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer from both the Groups as directed.

Group – A

(Objective Type Questions)

1. Choose the correct answer of the following:

\[ 2 \times 10 = 20 \]

(a) ________ is a type of processor architecture that utilizes a small, highly optimized set of instructions.

(i) CISC

(ii) RISC

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(Turn over)
(iii) VISC
(iv) LISC

(b) Normally digital computers are based on:
   (i) AND and OR gates
   (ii) NAND and NOR gates
   (iii) NOT gate
   (iv) None of the above

(c) The minimum time delay between the initiations of two independent memory operations is called:
   (i) Cycle time
   (ii) Access time
   (iii) Latency time
   (iv) None of the above

(d) The binary number of the Gray code number 11011 is:
   (i) 11010
   (ii) 10010
(iii) 10110
(iv) 00101

(e) _________ is a physical partition.

(i) Page
(ii) Segment
(iii) DMA
(iv) None of the above

(f) Which one does not change the information content during movement of binary information in register?

(i) Register transfer micro-operations
(ii) Arithmetic operations
(iii) Logic operations
(iv) None of the above

(g) In a Half-Adder, Carry is obtained by using _________ gate.

(i) OR
(ii) NAND
Group – B

(Long-answer Type Questions)

Answer any four questions.

2. (a) Consider a four variable Boolean function : 
\[ F = \Sigma(0, 4, 6, 7, 8, 10, 11, 15). \] 
Minimize this function using K map and realize it using gates. 
8

(b) Why NAND gate is called a universal gate ? 
Justify your answer. 
7

3. (a) Explain the various registers and their functions used in basic computer. 
8

(b) What is Interrupt ? Explain, in brief, the different types of interrupt with example. 
7

4. (a) Compare RISC and CISC architecture in brief. Also discuss the advantages and disadvantages of each. 
8

(b) Explain the various types of mapping procedures used by the Cache memory. 
7

UK – 6/1 (5) (Turn over)
5. Explain the following: 5×3 = 15
   (a) DMA
   (b) Virtual Memory
   (c) Counter

6. (a) What is flip-flop? Explain all types of flip-flop. 7
   (b) What is address mode? Differentiate between indexed and base-indexed addressing mode. 8

7. (a) What is the difference between zero address, one-address and two-address instructions? Illustrate with the help of examples. 6
   (b) Explain how the JK flip-flop can be made to function as a D flip-flop and T flip-flop. 9

8. (a) What is multiplexer? What are the functions of multiplexer inputs? Draw logic diagram of 4 to 1 line multiplexer giving function table also. 8

UK – 6/1 (6) Contd.
(b) What is memory? Discuss memory hierarchy. With the help of logical diagram also explain RAM.

9. (a) What is I/O Module? Define its types and functions.

(b) What do you mean by Hardwired Control? Explain the function of Wilkes control with the help of suitable diagram.