CBCS Scheme

USN | | | | | | | | | | |

16/17MCA14

First Semester MCA Degree Examination, Dec.2017/Jan.2018
Computer Organization

Time: 3 hrs. Max. Marks: 80

Note: *Answer FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Convert $(B65F)_{16}$ into its equivalent decimal number. **(03 Marks)**

b. Subtract $72532_{(10)}$ from $03250_{(10)}$ using 9's complement. **(04 Marks)**

c. Define binary logic. Explain three basic operations of binary logic with their truth tables. **(09 Marks)**

OR

2 a. Explain De-Morgan's theorem of Boolean Algebra. **(03 Marks)**

b. Solve the following Boolean function to a minimum number of terms or literals.
$x(x' + y) + x + x'y$. **(03 Marks)**

c. Simplify the following Boolean function using a Karnaugh map.
$F(w, x, y, z) = \Sigma(0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$. **(10 Marks)**

Module-2

3 a. Explain a full adder with its truth table, Karnaugh maps for simplifying the expressions for sum and carry along with a neat diagram. **(10 Marks)**

b. Explain a 3–to–8 line decoder with its truth table and a neat diagram. **(06 Marks)**

OR

4 a. What is a sequential circuit? Explain the R-S flip-flop with its logic diagram and truth table. **(07 Marks)**

b. Explain a shift register with a neat diagram. **(04 Marks)**

c. What is the difference between a ripple counter and a synchronous counter? Explain a 4 bit synchronous binary counter with a neat diagram. **(05 Marks)**

Module-3

5 a. Explain the basic functional units of a computer with a block diagram. **(05 Marks)**

b. Differentiate between multiprocessor systems and multicomputers. **(03 Marks)**

c. Explain the connections between the processor and the memory with a neat diagram. **(08 Marks)**

OR

6 a. Which are the four types of instruction that a computer should be able to perform? **(04 Marks)**

b. What are addressing modes? Explain immediate addressing, indirect addressing and relative addressing with examples. **(12 Marks)**

Module-4

7 a. What is a assembly language program? Give an example of ROM assembly level language programming. **(08 Marks)**

b. What is an interrupt? Give an example of handling interrupt. **(08 Marks)**

OR

8 a. What is Direct Memory Access(DMA)? How DMA transfers are carried out by a DMA controller. **(08 Marks)**

b. Explain the sequence of actions carried out by IA32 Intel processor when an interrupt request is received. **(08 Marks)**

Module-5

9 a. Explain any three types of ROM. **(06 Marks)**

b. Explain the terms latency and bandwidth with respect to memory. **(04 Marks)**

c. Explain the memory hierarchy and discuss speed, cost per bit and size of various types of memory. **(06 Marks)**

OR

10 a. Explain the purpose of cache memory. Explain direct mapping technique with an example. **(10 Marks)**

b. Explain the method of translating virtual addresses into physical addresses when programs and data are composed of fixed length units called pages. **(06 Marks)**

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