B.Tech.

(SEM. IV) THEORY EXAMINATION 2013-14

COMPUTER ARCHITECTURE AND ORGANISATION

Time : 3 Hours   *Total Marks : 100*

Note :– Attempt **all** questions.

1. Attempt **all** parts of the following :   **(10×2=20)**

    (a) What are the techniques used to increase processor speed ?

    (b) Compare SRAM vs DRAM.

    (c) Define an operating system.

    (d) List the advantages of paging.

    (e) How many blocks of main memory are present in :

        (i)   Supersections

        (ii)   Sections

        (iii) Large pages

        (iv) Small pages ?

    (f) Write a note on ALU.

    (g) Find 2's complement of $(11000100)_2$.

    (h) Represent $(1259.125)_{10}$ in single precision and double precision formats.

    (i) What is sensor ?

    (j) Give any three examples of embedded processor chips.

2. Attempt any **five** parts of the following : (5×6=30)

(a) Draw and explain block diagram of simple computer with five functional units.

(b) What do you mean by interrupt ?

(c) Explain the block diagram of Pentium 4 in detail with help of neat labelled diagram.

(d) What is DMA ? Explain DMA operation with a diagram.

(e) List various OS types and explain any one of them.

(f) Recode the multiplier 101100 for Booth's multiplication.

(g) Explain in detail ARM microcontroller.

Note :– Attempt all : (5×10=50)

3. Explain in detail the structure and functions of a computer.

OR

Explain in detail :

(i) Bus structure

(ii) Multiple-Bus Hierarchies

4. Formulate the Hamming code for four data bits D_3 D_5 D_6 and D_7, together with three parity bits P_1, P_2 and P_4 :

(i) Evaluate the 7-bit composite word of the data word 0010.

(ii) Assume an error in bit D_5 during writing into memory. Show how the error in bits is detected and corrected.

(iii) Add parity bit P_8 to include a double error detection in the code. Assume that error occurred in bits P_2 and D_5. Show how double error is detected.

OR

Explain in detail the types of semiconductor memories.

5. What is RAID ? List common characteristics of RAID. Compare between different RAID levels in detail.

OR

Explain programmed I/O in detail.

6. What is the purpose of Swapping ? Explain the purpose of a translation look aside buffer in ARM memory management with block diagram.

OR

Explain Booth's algorithm for two's complement multiplication using flowchart. Use the Booth algorithm to multiply 23 (multiplicand) by 29 (multiplier), where each number is represented using 6 bits.

7. Describe reaction timer with its block diagram.

OR

Explain in detail :

(i) Sensors

(ii) Actuators.