CEB410 COMPUTER ARCHITECTURE

UNIT-1

PART-A
1. Define micro operation.
2. What is MAR and MBR?
3. What is use of binary number?
4. What is the use of 4-bit arithmetic circuit?
5. What is the use of a binary incrementer?
6. What are the different types of shift micro operations?
7. What is use of arithmetic logic shift unit?
8. What is a control word?
10. What are the major components of CPU?

PART-B
1. Explain register transfer.
2. Explain (i) Bus transfer (ii) Memory transfer
3. Explain (i) Binary adder (ii) Binary adder–subtractor
4. (i) Explain binary incrementer.
   (ii) Write short note on single stage logic unit
5. Explain 4-bit arithmetic circuit.
6. Explain shift micro operations. Explain 4-bit combinational circuit shifter.
7. Explain arithmetic logic shift unit.
8. Explain the general register organization of CPU with control word.
9. Explain (i) Fetch cycle (ii) Indirect cycle and (iii) Execute cycle.

10. Explain the structure of control unit.

11. Explain hard wired control unit.

12. Explain microprogrammed control unit.

13. Explain how an arithmetic expression is evaluated by using stack.
UNIT-2

PART-A
1. What is alphaneumeric code?
2. What is overflow?
3. What is underflow?
4. What is divide overflow?
5. What do you mean by normalization?
6. What is biased exponent?

PART-B
1. Explain the hardware implementation and hardware algorithm for fixed point addition–subtraction.
2. Draw and explain the flow chart for multiply operation.
3. Draw and explain the hardware algorithm for fixed point division.
4. Explain the floating point addition and subtraction algorithm.
5. Explain the floating point multiplication algorithm.
6. Explain the floating point division algorithm.
UNIT-3

PART-A
1. What is I/O interface?
2. What is asynchronous data transfer?
3. What is the disadvantage of strobe control data transfer?
4. What are the three modes of data transfer?
5. What is DMA?
6. What is the need for IOP in a system?
7. What is hand shaking?

PART-B
1. (i) Compare memory mapped I/O and isolated I/O.
   (ii) Explain strobe control data transfer.
2. Explain source initiated and destination hand shaking data transfer.
3. (i) Explain daisy chaining priority.
   (ii) Explain parallel priority interrupt.
4. Explain DMA data transfer.
5. (i) Explain programmed I/O.
   (ii) Explain interrupt initiated I/O.
6. Explain how the communication between CPU and IOP occurs.
7. Explain FIFO buffer.
UNIT-4

PART-A
1. What is main memory?
2. What are the different types of auxiliary memories used in a computer system?
3. What is an associative memory?
4. What is cache memory?
5. What is hit ratio?
6. What are the different mapping techniques of cache memory?
7. What is virtual memory?
8. What is address space and memory space?

PART-B
1. (i) Explain about memory hierarchy.
   (ii) Explain RAM and ROM chips.
2. Explain memory address map and how memory is connected with CPU.
3. Explain the operation of an associative memory with block diagram.
4. (i) Explain the operational principle of cache memory.
   (ii) Explain cache initialization.
5. Explain the different mapping techniques of cache memory.
6. Explain paged memory system in virtual memory.
7. Explain page replacement in virtual memory.
UNIT-5

PART-A
1. Define bus.

2. What is pipelining?

3. What is an array processor?

4. What is vector processing?

5. What are the segment registers used in 8086?

6. What is effective address.

7. What is physical address?

8. What is throughput?

PART-B
1. Draw and explain the block diagram of 8086.

2. Explain arithmetic pipelining.

3. Draw the flow chart for four segment CPU pipelining and explain

4. Explain Flynn’s classification of parallel processing

5. Explain in detail about vector processing.

6. Explain in detail about array processors.

7. Explain
   (a) Distributed shared memory parallel computers
   (b) Superscalar processors.
PART – A

Answer any Fifteen Questions. Each question carries 1 mark.

1. Define micro operation.
2. What is a control function?
3. Give an example for logic micro operation.
4. What is hardwired control unit?
5. Define throughput.
6. What is alphanumeric code?
7. What is a parallel adder?
8. What is alignment of mantissa in floating point operations?
9. What is I/O interface?
10. What is a strobe?
11. Define DMA.
12. What is I/O processor?
13. Give an example for auxiliary memory.
14. What is content addressable memory?
16. Define virtual address.
17. What is addressing mode?
18. What is TLB?
19. What is pipelining?

20. Give an example for two core processor.

**PART – B**

(5 x 12 = 60 Marks)

Answer all questions choosing either A or B from each question. Each question carries 12 Marks

21. A. i. Draw one stage of ALU and explain. [12]

[ OR]

B i. Draw general register organization of CPU. [6]

ii. Explain how an arithmetic expression is evaluated by using stack. [6]

22. A. i. Explain about Hardware implementation and hardware algorithm for floating point addition – subtraction [12]

[ OR]

B i. Explain fixed point multiplication and division algorithm with signed magnitude data. [12]

23. A. i. Explain the types of handshaking data transfer. [12]

[ OR]

B i. Explain about daisy chain priority interrupt [12]

24. A. i. Explain any one mapping method of cache memory [12]

[ OR]

B i. Explain about virtual memory. [12]

25. A. i. Explain Flynn’s Classification of Parallel Processing, [12]

[ OR]

B i. Briefly explain about Array Processors [12]