Time : 3hrs   **Full marks: 70**

The questions are of equal marks
Answer any five questions
Answer should be brief and to the point.

1. What is the difference between INTEL 8085 and 8086 processors? Describe the architecture of INTEL 8086 with suitable diagram. Describe the register organization of 8086. What are the utilities of segment Registers?

2. Draw a three-bus organization of a processor with annotation. Write step action for the instruction Add R4, (R5) and explain it with respect to above mentioned processor. Explain the generation of any two control signal using hardwired control. Mention assumptions (if any).

3. How control signals required inside the processor can be generated using microprogrammed control? Draw the organization of control unit to allow conditional branching in the microprogram. How the above organization can be modified to microinstructions with next address field?

4. Draw the register configuration of a multiplier and explain with an example to get the final result. Write the algorithm for the multiplier.

5. Classify typical memory system used in computer. Explain Static Memories, Asynchronous and Synchronous DRAMs. What is the use of static memory? Why DRAMs are used as main memory in computer?

6. What is the disadvantage of using n-bit ripple carry adder? Develop a solution for this problem. Explain the solution with 4-bit adder circuit. How a 16-bit adder can be developed?

7. What do you understand by pipelining in a computer? A computer has 4–stage pipeline having four steps Fetch(F), Decode(D), Execute(E) and Write(W). Explain sequence of operation for four instructions. Explain how performance of pipelining is measured.

8. Define the terms different hazards in the context of pipelines. Which of these hazards is addressed by a hardware branch predictor and how? For one of the other hazards, suggest a way, either in software or hardware, the effect of that hazard could be reduced.