

[Time: 3 Hours]

[Total marks: 80]

- N.B. 1. Question No 1 is compulsory.
2. Solve any **three** questions out of the remaining five questions.
3. Assume suitable data if necessary.
4. Figures to the right indicate marks.

- Q. 1. Solve any **four** out of five. (4*5=20)
- Explain the working of D flip-flop.
 - With the help of a diagram, explain Von-Neumann's architecture.
 - Convert $(-20.25)_{10}$ in the IEEE 754 single precision floating point standard.
 - Describe the six stage instruction pipeline.
 - Draw the memory hierarchy and explain the same.
- Q. 2. a) Draw the flowchart of Booth's Algorithm and multiply (-5) and (6) using the same. (10)
- b) Explain half subtractor and full subtractor using truth table and circuit diagram. (10)
- Q. 3. a) Reduce given Boolean expression using K-Map method.
- $$f(A,B,C,D) = \sum (0, 1, 2, 4, 5, 7, 8, 10, 11, 13, 15) \quad (10)$$
- b) Write an assembly language program for an 8086 microprocessor to find the even and odd numbers from the list of given ten, 8 bit binary numbers. (10)
- Q. 4. a) Explain Set associative cache mapping technique with example. (10)
- b) Describe Flynn's classification in detail. (10)
- Q. 5. a) Discuss the various characteristics of Memory. (10)
- b) Explain design of control unit w.r.t. microprogrammed and hardwired approach. (10)
- Q. 6. a) Explain different addressing modes of 8086 microprocessors with examples. (10)
- b) Discuss the need of I/O module and explain its various I/O techniques in brief. (10)