

**PUNE VIDHYARTHI GRIHA'S  
COLLEGE OF SCIENCE & TECHNOLOGY  
F.Y. B.SC (COMPUTER SCIENCE) – SEM-I  
SUB: DIGITAL SYSTEM & ARCHITECTURE**

**PAPER CODE:USCS101**

**(TIME :2 ½ Hrs.)**

**TOTAL MARKS :75M**

**N.B:-**

1. All questions are compulsory.
2. Answers to the same question must be written together.
3. Numbers to the right indicate full marks.
4. Draw neat labeled diagrams wherever necessary.
5. Use of Non-programmable calculators are allowed.

**Q1) Attempt the following (Any Four) (Each of 5 marks)**

**[20M]**

A) State and prove De Morgan's theorem.

B) Prove the following Boolean expressions.

- i)  $A + AB = A$
- ii)  $A + A'B = A + B$
- iii)  $(A+B)(A+C) = A + BC$

C) Discuss Multiplexer with suitable diagram.

D) Define flip-flop. Write down its characteristics.

E) Difference between Asynchronous and Synchronous counter.

F) What are the Computer Components and its function.

**Q2) Attempt the following (Any Four) (Each of 5 marks)**

**[20M]**

A) Write a short note on Type of ROM.

B) Explain the Lower Order Interleaved Memory

C) Explain Direct cache mapping techniques.

D) Write a short note on Magnetic Disk.

E) Write a short note on Cache Coherency.

F) Explain Cache Memory Read Operation with the help of block diagram.



**Q3) Attempt the following (Any Four) (Each of 5 marks)**

[20M]

- A) Difference between 8085 microprocessor and 8086 microprocessor.
- B) Explain CPU architecture.
- C) Explain multicore processor structure.
- D) Describe the register organization within the CPU.
- E) Write comparison between RISC and CISC.
- F) Explain any five instructions of 8086 microprocessors with suitable examples.

**Q4) Attempt The Following (Any Five) (Each Of 3 Marks)**

[15M]

- A) Differentiate between Computer Organization and Computer Architecture.
- B) Explain Bus Interconnection and different method to resolve it.
- C) Write note on Programmed I/O.
- D) What is DMA? Explain working of DMA.
- E) Write a short note on Flash Memory.
- F) Write a short note on Optical Disk.