

BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-III Computer Science & Engineering : SUMMER : 2025
SUBJECT: MACHINE ORGANIZATION & MICROPROCESSORS

Day : Thursday
Date : 15/05/2025

S-29204-2025

Time : 02:30 PM-05:30 PM
Max. Marks : 60

N.B.:

- 1) All questions are **Compulsory**.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Draw neat diagrams **WHEREVER** necessary.
- 4) Assume suitable data, if **necessary**.

- Q.1** Explain the main features of the 80386 processor and describe its architecture. (10)
How did it improve upon its predecessors in terms of performance and capability?

OR

Describe the use of various 80386 Data Movement Instructions in assembly language programming with examples. Also, Differentiate between Real Mode and Virtual Mode in 80386. (10)

- Q.2** Describe the purpose and structure of the Flag Register of 80386. How do different flags influence the execution of instructions? Provide examples of how the Zero Flag (ZF) and Carry Flag (CF) are used in control flow. (10)

OR

Explain the Segment Translation Process with a neat diagram of 80386. Also, Enlist various types of system and non-system descriptors in the 80386. Explain their use in brief. (10)

- Q.3** Why is protection important in modern processors, particularly in multitasking environments? Discuss how the protection mechanisms of the 80386 ensure that processes are isolated from one another and system resources are secured. (10)

OR

Explore the role of various fields in Page Level protection. Also, define the functions of Type Checking and Limit Checking in protection. (10)

- Q.4** Explain the concept of I/O addressing in the 80386 processor. What is the difference between memory-mapped I/O and port-mapped I/O? Provide an example showing how the processor addresses an I/O device using port-mapped I/O. (10)

OR

How does the 80386 processor provide protection in I/O operations? Discuss the use of the I/O Privilege Level (IOPL) in the FLAGS register and how it prevents unauthorized access to I/O ports. (10)

P.T.O.

Q.5 Explain the state of the 80836 processor after a reset. What key settings and registers are initialized by the hardware upon reset, and how does the processor begin execution in Real Address Mode? (10)

OR

Draw and Explain Debug Registers of 80386. Also explain debug exception. (10)

Q.6 Describe the architecture of a typical microcontroller. What are the key components that differentiate a microcontroller from a general - purpose microprocessor? Provide an example of a common microcontroller and explain its architecture. (10)

OR

Describe the structure of the stack in Virtual 8086 (V86) mode. How does the V86 mode handle the stack, and what are the challenges in managing stack operations when simulating real-mode behaviour? Provide an example showing how stack operations differ between real mode and V86 mode. (10)

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