

BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-III Computer Science & Engineering : WINTER : 2024
SUBJECT: MACHINE ORGANIZATION & MICROPROCESSORS

Day : Monday
Date : 09/12/2024

W-29204-2024

Time : 10:00 AM-01:00 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 Describe the use of various 80386 Data Movement Instructions in assembly language programming with examples. (10)

OR

What data types are supported by the 80386 processor? Describe these data types and explain how the processor handles them during operations. Provide examples of instructions that operate on different data types. (10)

Q.2 What are control registers in the 80386 processor? Discuss the significance of the CR0, CR2 and CR3 registers and their role in memory management and protection. Provide an example of the how the CR3 register is used for page table management. (10)

OR

Discuss the role of test registers in 80386. How were test registers used for page translation Lookaside Buffer (TLB) testing and why were they eventually deprecated in newer processors? (10)

Q.3 How does page-level protection work in the 80386 processor? Describe the role of the page table and how it controls access to memory pages. Provide an example showing how page-level protection is enforced in multitasking environment. (10)

OR

How does 80386 processor combine segment and page-level protection to enhance memory management security? Describe how both protection scheme work together to ensure that memory is accessed securely. (10)

Q.4 Explain the following exception conditions with an example: Faults, Traps and Aborts. Also, Explain how interrupts are handled in protection mode. Explain with the help of neat diagram. (10)

OR

Explain the types of descriptors used in the Interrupts Descriptor Table (IDT) of the 80386 processor. What are interrupt gates, trap gates and how are they used? Provide an example showing the use of an interrupt gate in handling a hardware interrupt. (10)

P.T.O.

Q.5 What are the key tasks involved in software initialization for protected Mode (10) in the 80386 processor? Explain how segmentation and paging are set up during the initialization process and why these features are critical for multitasking and memory protection.

OR

Provide a detailed example of the initialization process in the 80386 processor, (10) Starting from Real Address Mode. Include key steps such as segment initialization, switching to Protected Mode, and enabling paging.

Q.6 Explain the role of microcontrollers in embedded systems. Provide examples (10) of specific applications where microcontrollers are used and discuss how their architecture makes them suitable for these tasks.

OR

Draw and Explain the Architecture of a Typical Microcontroller. List and (10) elaborate on different applications of Microcontrollers.

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