

GUJARAT TECHNOLOGICAL UNIVERSITY

DI -5 SEMESTER – OLD PAPER – W23 TO S25 – QUESTION BANK(English)

Subject Name & Code:

Computer Organization and Architecture- 4350701

Unit I: Basics of Computer Organization and Processor Evolution

Repeated Questions:

1. **Explain basic CPU structure with diagram.**
 - Appeared in: S24 (Q1a, 03 marks), S25 (Q1c, 07 marks - related to architecture)
2. **List and define types of bus.**
 - Appeared in: W23 (Q1a, 03 marks), S25 (Q1b, 04 marks)
3. **Define Microprocessor. List out various registers used in a computer system.**
 - Appeared in: S24 (Q2a, 03 marks), W23 (Q1b, 04 marks - related to CPU registers)

Other Important Questions:

- List out various 8bit, 16 bit, 32 bit intel microprocessor. (S24 - Q2a(OR), 03 marks)
- Describe various registers used in CPU. (W23 - Q1b, 04 marks)
- List types of Registers, Define Program counter and Instruction Register. (W24 - Q1a, 03 marks)
- Describe Bus organization of digital computer. (W24 - Q1a, 03 marks)
- Define Control Unit (CU). List out the functions of Control Unit (CU). (S25 - Q1a, 03 marks)
- Define following terms: Instruction, Machine cycle, Instruction cycle, T-state. (W23 - Q2b(OR), 04 marks)
- Define Instruction Cycle, Machine Cycle and T-state. (W24 - Q1a(OR), 03 marks)
- Explain following terms related to instruction execution: T-State, Machine Cycle, Instruction Cycle (S25 - Q2a(OR), 03 marks)
- Write phases of instruction execution with short description. (W23 - Q2a, 03 marks)
- Explain fetch, decode and execute phase of instruction execution. (S25 - Q3b, 04 marks)

Unit II: 8085 Microprocessor

Repeated Questions:

1. Draw pin diagram of 8085. (S24 - Q1b, 04 marks)
2. Explain architecture of 8085 with block diagram. (S24 - Q1c, 07 marks)
3. Explain flag register of 8085 with diagram. (S24 - Q2b, 04 marks)
4. Define following pins of 8085 microprocessor i) ALE ii) IO/M' iii) INTR iv) HOLD (W24 - Q1a(OR), 03 marks)

Other Important Questions:

5. Draw and describe 8085 Pin Diagram. (W24 - Q1a, 03 marks)
6. Draw and describe 8085 Microprocessor Architecture. (W24 - Q1a, 07 marks)
7. Draw pin diagram of 8085 and describe pin functions. (W23 - Q1c, 07 marks)
8. Describe 8085 Microprocessor Architecture with suitable diagram. (W23 - Q1c(OR), 07 marks)
9. Draw and Explain architecture of 8085 microprocessor. (S25 - Q1c, 07 marks)
10. Draw the pin diagram of 8085 microprocessor. List out various groups of pins. Explain control and status pins of 8085 in detail. (S25 - Q1c(OR), 09 marks)
11. Explain the pins related to externally initiated signals. (S25 - Q2a, 03 marks)
12. Explain register organization of 8085 microprocessor in detail. (S25 - Q2b, 04 marks)
13. List and Define Each Special Purpose Register in 8085 Microprocessor. (W24 - Q2a, 03 marks)
14. List and Define flags in flag register of 8085 microprocessor. (W24 - Q2a, 04 marks)
15. Describe 8085 General Purpose Registers. (W23 - Q2a(OR), 03 marks)
16. List flag registers with its usage. (W23 - Q2b, 04 marks)
17. Draw and Explain the flag register of 8085 microprocessor. (S25 - Q2b(OR), 04 marks)
18. Explain register organization of 8085 with diagram. (S24 - Q2b(OR), 04 marks)
19. Write down the function of following pins. 1. ALE 2. HOLD 3. READY (S24 - Q3a, 03 marks)
20. Write down the function of following pins. 1. INTR 2. HLDA 3. IO/M' (S24 - Q3a(OR), 03 marks)

Unit III: 8085 Assembly Language Programming

Repeated Questions:

1. **Write an assembly language program to add two numbers stored at memory locations.**
 - Appeared in: W24 (Q4a, 03 marks), W23 (Q4a(OR), 03 marks), S24 (Implied in Q2c & Q2c(OR))
2. **List out and explain addressing modes of 8085.**
 - Appeared in: S24 (Q4b, 04 marks), W23 (Q2c(OR), 07 marks)
3. **List out data transfer instructions.**
 - Appeared in: W23 (Q3a, 03 marks), S25 (Q3a, 03 marks)

Other Important Questions:

4. Write an assembly language program for adding 27H and 69 and show status of flag register of 8085 at the end of it. (S24 - Q2c, 07 marks)
5. Write 8085 assembly language program to subtract 23H from 45H and show status of flag register of 8085 at the end of it. (S24 - Q2c(OR), 07 marks)
6. Write an assembly language program to move immediate data 96h into Register B and then move Immediate data 43h to register C. Finally load the HL pair with the 16-bit data stored at memory location 9643h. (W23 - Q3c, 07 marks)
7. Write an assembly language program to increment a number stored in memory location 8000h and store the result back into the same memory location using indirect addressing mode. (W23 - Q3c(OR), 07 marks)
8. Write an assembly language program to add 2 16-bit numbers stored in memory locations 2050h and 2052h instruction and store the answer at memory location 2054h. (W23 - Q4a, 03 marks)
9. Write an assembly language program to swap data on memory location 2040h & 3050h. (W24 - Q3c, 07 marks)
10. Write an assembly language program to load data into accumulator which is pointed by memory location 2000h, also store that data into 2050h memory location. (W24 - Q3c(OR), 07 marks)
11. Implement an assembly language program to add two 16-bit numbers stored in register pair BC and DE. Store 16-bit result into memory locations 2001h and 2002h. (S25 - Q3c, 07 marks)
12. Explain following logical instructions with example. (a) ANI 23h (b) XRA A c) RLC (S25 - Q3a(OR), 03 marks)
13. Implement an assembly language program to multiply two 8-bit numbers stored in B and C registers. Store 16-bit result into memory location 2000h and 2001h. (S25 - Q3c(OR), 07 marks)
14. Explain PUSH and POP instruction in detail. (S25 - Q4a, 03 marks)

15. Implement an assembly language program to subtract 34h from 8Fh without using subtraction instruction. Store result into memory location 2024h. (S25 - Q4a(OR), 03 marks)
16. Explain various rotate instructions in detail. (S25 - Q4b(OR), 04 marks)
17. List out and write function of conditional jump instructions. (S24 - Q4a, 03 marks)
18. List out and write function of conditional call instructions. (S24 - Q4a(OR), 03 marks)
19. List out rotate instructions in 8085. Explain any two in detail. (S24 - Q4b(OR), 04 marks)
20. Write down syntax and function of following instructions. 1. LHLD 2. MVI 3. ADC 4. PCHL 5. MOV 6. STA 7. CMA (S24 - Q3c(OR), 07 marks)
21. State the usage of machine control instruction. (W23 - Q3a(OR), 03 marks)
22. Define CMP, XRI, IN and OUT instruction. (W23 - Q3b(OR), 04 marks)
23. Define 1-Byte, 2-Byte and 3-Byte Instruction format (W24 - Q3a, 03 marks)
24. Define following Logical Instructions of 8085 microprocessor. i) ORA ii) ORI iii) XRI iv) RLC (W24 - Q3b, 04 marks)
25. List and Define Data Transfer Instructions of 8085 microprocessor. (W24 - Q3a(OR), 03 marks)
26. Define following Jump Instructions of 8085 microprocessor. i) JC ii) JNZ iii) JPE iv) JP (W24 - Q3b(OR), 04 marks)

Unit IV: Memory Organization

Repeated Questions:

1. **Explain Cache Memory.**
 - Appeared in: W23 (Q4c, 07 marks), S24 (Q4c(OR), 07 marks), S25 (Q4c, 07 marks)
2. **Explain/Describe Virtual Memory.**
 - Appeared in: W23 (Q4c(OR), 07 marks), S24 (Q5b(OR), 04 marks), S25 (Q5b, 04 marks)
3. **Classify and describe different types of memory.**
 - Appeared in: W24 (Q4c, 07 marks), S24 (Q4c, 07 marks)

Other Important Questions:

4. Give full form of RAM, ROM, PROM and EPROM (W23 - Q4b, 04 marks)
5. Define Associative Memory, Auxiliary memory, Cache memory and Virtual Memory. (W23 - Q4b(OR), 04 marks)
6. Define the following memory i) Virtual Memory ii) Cache Memory iii) Magnetic Tape iv) Hard Disks (W24 - Q4b, 04 marks)
7. Define the following memory i) RAM ii) ROM iii) EPROM iv) Associative Memory (W24 - Q4b(OR), 04 marks)
8. Describe Memory Hierarchy. (W24 - Q4c(OR), 07 marks)
9. Explain primary memory in detail. (S24 - Q4c, 07 marks)
10. Explain cache memory with three different mapping techniques. (S24 - Q4c(OR), 07 marks)
11. Write a short note on associative memory. (S24 - Q5b, 04 marks)
12. Write a short note on virtual memory. (S24 - Q5b(OR), 04 marks)
13. Explain Cache Memory with its hit ratio and different types of mapping. (S25 - Q4c, 07 marks)
14. Explain associative memory in detail. (S25 - Q4c(OR), 07 marks)
15. Classify different types of memory used in system. Explain memory hierarchy in detail. (S25 - Q5b, 04 marks)
16. List out different types of auxiliary memories. Explain magnetic tape and magnetic disk. (S25 - Q5b(OR), 04 marks)
17. Define the term Hit & Miss of Cache Memory with example. (W23 - Q5b(OR), 04 marks)

Unit V: Input/Output Organization

Repeated Questions:

1. **Explain CPU-IOP communication.**
 - Appeared in: W23 (Q5c, 07 marks), S24 (Q5c, 07 marks), S25 (Multiple parts in Q5)
2. **Explain/Define I/O Interface.**
 - Appeared in: W23 (Q5a(OR), 03 marks), S24 (Q5a, 03 marks), S25 (Q5a, 03 marks)
3. **Explain asynchronous data transfer.**
 - Appeared in: S24 (Q5a, 03 marks), S25 (Q5c, 07 marks)

Other Important Questions:

4. Define following terms: peripheral, interface, strobe. (W23 - Q5a, 03 marks)
5. Define auxiliary memory and give its types. (W23 - Q5b, 04 marks)
6. Define Input-Output interface with example. (W23 - Q5a(OR), 03 marks)
7. Describe various modes of data transfer with I/O. (W23 - Q5c(OR), 07 marks)
8. List and Define Modes of Data Transfer with I/O. (W24 - Q5a(OR), 03 marks)
9. Differentiate Programmed I/O and Interrupt Initiated I/O. (W24 - Q5c(OR), 07 marks)
10. Give the difference between isolated I/O and memory mapped I/O. (S24 - Q5a(OR), 03 marks)
11. Classify the various modes of data transfer and explain any two in detail. (S24 - Q5c(OR), 07 marks)
12. Explain the I/O bus and I/O interface. (S25 - Q5a, 03 marks)
13. Define asynchronous data transfer. Explain methods of asynchronous data transfer in detail. (S25 - Q5c, 07 marks)
14. Explain I/O interface unit with proper diagram. (S25 - Q5a(OR), 03 marks)
15. List out asynchronous data transfer methods. Explain any one in detail. (S24 - Q5a, 03 marks)
