

| Guru Nanak Dev Engineering College, Ludhiana | | | |
|--|---------------------------|-----------------------|--|
| Department of Information Technology | | | |
| Program | B.Tech (IT) | Semester | 4 th |
| Subject Code | PCIT-108 | Subject Title | Computer Architecture and Microprocessor |
| MST No | 2 | Course Coordinator(s) | Dr. Amit Kaur / Dr. Gitanjali |
| Max. Marks | 24 | Time Duration | 1 hour 30 minutes. |
| Date of MST | 22 nd May 2023 | Roll Number | |

Note: Attempt all questions

| Q. No. | Question | COs, RBT level | Marks |
|--------|--|--------------------|-------|
| Q1 | Explain how the parallel processing improves the performance of multiprocessing environment. | CO4, L2 | 2 |
| Q2 | Support the statement "The use of microprocessor makes daily life easier" with the help of real time applications. | CO6, L5 | 2 |
| Q3 | a) Illustrate the need and significance of memory hierarchy. b) Discuss the main objective of multiprocessor. | CO1, L3 CO1, L2 | 4 |
| Q4 | a) Calculate the total number of cells in 64 Kb*8 memory chip. b) How many 256MB memory chips are required to build the memory capacity of 4GB RAM? | CO3, L3 CO1, L5 | 4 |
| Q5 | Differentiate a) Microprocessor and microcontroller b) Virtual Memory and Cache Memory | CO6, L4 CO1, L4 | 4 |
| Q6 | Draw the pin diagram of 8051 microcontroller and explain the functionality of each pin. | CO6, L6 | 8 |

Course Outcomes (CO)

Students will be able to

| | |
|---|--|
| 1 | Identify computer systems, memory organization, Microprocessor and assembly language programming. |
| 2 | Clarify instruction formats, RISC and CISC architecture and different addressing modes. |
| 3 | Solve basic binary math operations by using the instructions of microprocessor. |
| 4 | Compare between pipelining and parallelism. |
| 5 | Design structured, well commented, understandable assembly language programs to provide solutions to real world problems |
| 6 | Classify the trends and developments of microprocessor technology |

| RBT Classification | Lower Order Thinking Levels (LOTS) | | | Higher Order Thinking Levels (HOTS) | | |
|--------------------|------------------------------------|---------------|----------|-------------------------------------|------------|----------|
| RBT Level Number | L1 | L2 | L3 | L4 | L5 | L6 |
| RBT Level Name | Remembering | Understanding | Applying | Analyzing | Evaluating | Creating |

Guru Nanak Dev Engineering College, Ludhiana
Department of Information Technology

| | | | |
|---------------------|---------------------------|------------------------------|--|
| Program | B.Tech (IT) | Semester | 4 th |
| Subject Code | PCIT-108 | Subject Title | Computer Architecture and Microprocessor |
| MST No | 2 | Course Coordinator(s) | Dr. Amit Kamra / Er. Gitanjali |
| Max. Marks | 24 | Time Duration | 1 hour 30 minutes |
| Date of MST | 22 nd May 2023 | Roll Number | |

Note: Attempt all questions

| Q. No. | Question | COs, RBT level | Marks |
|---------------|--|-----------------------|--------------|
| Q1 | Explain how the parallel processing improves the performance of multiprocessing environment. | CO4, L2 | 2 |
| Q2 | Support the statement "The use of microprocessor makes daily life easier" with the help of real time applications. | CO6, L5 | 2 |
| Q3 | a) Illustrate the need and significance of memory hierarchy. b) Discuss the main objective of multiprocessor. | CO1, L3 CO1, L2 | 4 |
| Q4 | a) Calculate the total number of cells in 64 Kb*8 memory chip. b) How many 256MB memory chips are required to build the memory capacity of 4GB RAM? | CO3, L3 CO1, L5 | 4 |
| Q5 | Differentiate a) Microprocessor and microcontroller b) Virtual Memory and Cache Memory | CO6, L4 CO1, L4 | 4 |
| Q6 | Draw the pin diagram of 8051 microcontroller and explain the functionality of each pin. | CO6, L6 | 8 |

Course Outcomes (CO)

Students will be able to

- Identify computer systems, memory organization, Microprocessor and assembly language programming
- Clarify instruction formats, RISC and CISC architecture and different addressing modes.
- Solve basic binary math operations by using the instructions of microprocessor.
- Compare between pipelining and parallelism.
- Design structured, well commented, understandable assembly language programs to provide solutions to real world problems
- Classify the trends and developments of microprocessor technology

| RBT Classification | Lower Order Thinking Levels (LOTS) | | | Higher Order Thinking Levels (HOTS) | | |
|---------------------------|---|---------------|----------|--|------------|----------|
| RBT Level Number | L1 | L2 | L3 | L4 | L5 | L6 |
| RBT Level Name | Remembering | Understanding | Applying | Analyzing | Evaluating | Creating |

| | | | |
|---------------------|---------------|------------------------------|---|
| Program | B.Tech. (IT) | Semester | 4 |
| Subject Code | PCIT-108 | Subject Title | Computer Architecture & Microprocessors |
| MST No. | 1 | Course Coordinator(s) | Dr. Amit Kamra / Er. Gitanjali |
| Max. Marks | 24 | Time Duration | 1 hour 30 minutes |
| Date of MST | 24 March 2023 | Roll Number | |

Note: 1. Attempt all the questions in serial order.

| Q. No. | Question | COs, RBT level | Mark |
|---------------|---|-----------------------|-------------|
| Q1 | Demonstrate the execution of the following instructions (i) LDA addr ii) ADC r iii) CMA iii) PUSH rp. | CO3, L3 | 2 |
| Q2 | Differentiate microprocessor and microcontroller. | CO1, L4 | 2 |
| Q3 | Discuss the different ways in which the location of the operand is specified in an instruction of Intel 8085? Explain them with the help of examples. | CO2, L2 | 4 |
| Q4 | Describe the different steps of instruction cycle with the help of flow chart. | CO1, L2 | 2 |
| Q5 | Write an assembly language program to add two 8-bit numbers without the carry. | CO5, L6 | 2 |
| Q6 | Draw and explain the architecture of the 8085 microprocessor. | CO1, L6 | 2 |

Course Outcomes (CO) Students will be able to:

- Identify computer systems, memory organization, Microprocessor and assembly language programming
- Clarify instruction formats, RISC and CISC architecture and different addressing modes
- Solve basic binary math operations by using the instructions of microprocessor
- Compare between pipelining and parallelism
- Design structured, well commented, understandable assembly language programs to provide solutions to world problems

Classify the trends and developments of microprocessor technology

| RBT Classification | Lower Order Thinking Levels (LOTS) | | | Higher Order Thinking Levels (HOTL) | | |
|-------------------------------|---|----------|-----------|--|----------|-----------------|
| | L1 | L2 | L3 | L4 | L5 | L6 |
| Level | Recalling | Applying | Analyzing | Evaluating | Creating | Decision Making |

Guru Nanak Dev Engineering College, Ludhiana

Department of Information Technology

| | | | |
|---------------------|---------------|------------------------------|-------------------------------|
| Program | B.Tech. (IT) | Semester | 4 |
| Subject Code | PCIT-108 | Subject Title | Computer Architecture & Mi |
| MST No. | 1 | Course Coordinator(s) | Dr. Amit Kamra / Er. Gitanjal |
| Max. Marks | 24 | Time Duration | 1 hour 30 minutes |
| Date of MST | 24 March 2023 | Roll Number | 2104551 |

Note: 1. Attempt all the questions in serial order.

| Q. No. | Question | COs, RBT level |
|---------------|---|-----------------------|
| Q1 | Demonstrate the execution of the following instructions (i) LDA addr ii) ADC r ii) CMA iii) PUSH rp. | CO3, L3 |
| Q2 | Differentiate microprocessor and microcontroller. | CO1, L4 |
| Q3 | Discuss the different ways in which the location of the operand is specified in an instruction of Intel 8085? Explain them with the help of examples. | CO2, L2 |
| Q4 | Describe the different steps of instruction cycle with the help of flow chart. | CO1, L2 |
| Q5 | Write an assembly language program to add two 8-bit numbers without the carry. | CO5, L6 |
| Q6 | Draw and explain the architecture of the 8085 microprocessor. | CO1, L6 |

Course Outcomes (CO) Students will be able to:

| | |
|---|---|
| 1 | Identify computer systems, memory organization, Microprocessor and assembly language programming |
| 2 | Clarify instruction formats, RISC and CISC architecture and different addressing modes |
| 3 | Solve basic binary math operations by using the instructions of microprocessor |
| 4 | Compare between pipelining and parallelism |
| 5 | Design structured, well commented, understandable assembly language programs to provide solutions to world problems |
| | Classify the trends and developments of microprocessor technology |

| RBT Classification | Lower Order Thinking Levels (LOTS) | | | Higher Order Thinking Levels (HOTS) | | |
|---------------------------|---|---------------|----------|--|------------|----------|
| RBT Level No. | L1 | L2 | L3 | L4 | L5 | L6 |
| RBT Level | Remembering | Understanding | Applying | Analyzing | Evaluating | Creating |

Guru Nanak Dev Engineering College, Ludhiana

Department of Information Technology

| | | | |
|---------------------|---------------|------------------------------|---|
| Program | B.Tech.(IT) | Semester | 4 |
| Subject Code | PCIT-108 | Subject Title | Computer Architecture & Microprocessors |
| MST No. | 1 | Course Coordinator(s) | Er. Yadvir Kaur |
| Max. Marks | 24 | Time Duration | 1 hour 30 minutes |
| Date of MST | 25 March 2022 | Roll Number | |

Note: 1. Attempt all the questions in serial order.

| Q. No. | Question | COs, RBT level | Marks |
|---------------|---|-----------------------|--------------|
| Q1 | What is the main purpose of assembly language? What are the advantages of assembly language over machine language? | CO1, L1 | 2 |
| Q2 | Convert the following numerical arithmetic expression into reverse Polish notation and show the stack operations for evaluating the numerical result. $((3+4) * 10 + 2) * 8 + 6) * 4$ 2328 | CO1, L3 | 2 |
| Q3 | A computer register T of 8-bits is having hexadecimal 72 as its initial value. What will be the values of status bits C, S, Z, and V after subtracting the immediate operand hexadecimal C9 from T. | CO1, L5 | 4 |
| Q4 | What are Addressing Modes. An instruction is stored at location 400 with its address field at location 401. The address field has the value 500. A processor register R contains the number 100. Evaluate the effective address if the addressing mode of the instruction is (a) direct; (b) immediate; (c) relative; (d) register indirect (e) index with R as the index register. 100 500 401 982 | CO2, L5 | 4 |
| Q5 | Write 1-address and zero address instructions for: $(A*B)+(C*D)+(E*F)$. | CO2, L5 | 4 |
| Q6 | If the value of R flip flop is 1, this means that control will go through an interrupt cycle. In such cases, explicate the sequence of micro-operations that would occur. Also draw the Flowchart for Interrupt Cycle. | CO1, L2 | 8 |

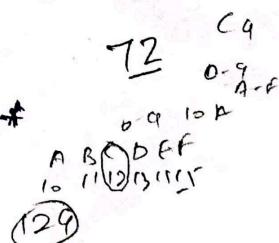
Course Outcomes (CO) Student: will be able to:

| | |
|---|--|
| 1 | Identify computer systems, memory organization, Microprocessor and assembly language programming |
| 2 | Clarify instruction formats, RISC and CISC architecture and different addressing modes |
| 3 | Solve basic binary math operations by using the instructions of microprocessor |
| 4 | Compare between pipelining and parallelism |
| 5 | Design structured, well commented, understandable assembly language programs to provide solutions to real-world problems |
| 6 | Classify the trends and developments of microprocessor technology |

| RBT Classification | Lower Order Thinking Levels (LOTS) | | | Higher Order Thinking Levels (HOTS) | | |
|--------------------|------------------------------------|---------------|----------|-------------------------------------|------------|----------|
| RBT Level No. | L1 | L2 | L3 | L4 | L5 | L6 |
| RBT Level Name | Remembering | Understanding | Applying | Analyzing | Evaluating | Creating |

$$\begin{aligned}
 & 72 \times 8 \\
 & 56 + 6 \\
 & 562 \times 4 \\
 & 2328
 \end{aligned}$$

$$\begin{aligned}
 & 34 + 10 * 2 + 8 * 6 + 4 \\
 & C = 0 \quad Z = 0 \\
 & S = 1 \quad V = 0
 \end{aligned}$$



| Guru Nanak Dev Engineering College, Ludhiana | | | |
|--|----------------------------|-----------------------|---|
| Department of Information Technology | | | |
| Program | B.Tech.(IT) | Semester | 4 |
| Subject Code | PCIT-108 | Subject Title | Computer Architecture & Microprocessors |
| MST No. | 2 | Course Coordinator(s) | Er. Yadvir Kaur |
| Max. Marks | 24 | Time Duration | 1 hour 30 minutes |
| Date of MST | 30 th May, 2022 | Roll Number | |

Note: 1. Attempt all the questions in serial order.

| Q. No. | Question | COs, RBT level | Marks |
|--------|--|----------------|-------|
| Q1 | What do you understand by Cache coherence Problem? Give an example. | CO1, L1 | 2 |
| Q2 | Discuss the difference between tightly coupled and loosely coupled multiprocessors. | CO1, L3 | 2 |
| Q3 | A non-pipeline system takes 50ns to process a task. The same task can be processed in a six-segment pipeline with a clock cycle of 10ns. Calculate the speedup of the pipeline for 10 tasks and again for 100 tasks. What is the maximum speedup that can be achieved? | CO4, L5 | 4 |
| Q4 | What is the need and significance of memory hierarchy? Also illustrate the memory hierarchy in order of their features with their comparative analysis | CO1, L5 | 4 |
| Q5 | Explain with the help of block diagram architecture of 8051. | CO6, L5 | 4 |
| Q6 | What is the need of cache memory? Explain different types of cache mapping using diagrams. | CO1, L2 | 8 |

Course Outcomes (CO) Students will be able to:

| | |
|---|--|
| 1 | Identify computer systems, memory organization, Microprocessor and assembly language programming |
| 2 | Clarify instruction formats, RISC and CISC architecture and different addressing modes |
| 3 | Solve basic binary math operations by using the instructions of microprocessor |
| 4 | Compare between pipelining and parallelism |
| 5 | Design structured, well commented, understandable assembly language programs to provide solutions to real-world problems |
| 6 | Classify the trends and developments of microprocessor technology |

| RBT Classification | Lower Order Thinking Levels (LOTS) | | | Higher Order Thinking Levels (HOTS) | | |
|--------------------|------------------------------------|---------------|----------|-------------------------------------|------------|----------|
| | L1 | L2 | L3 | L4 | L5 | L6 |
| RBT Level No. | | | | Analyzing | Evaluating | Creating |
| RBT Level Name | Remembering | Understanding | Applying | | | |

16 - 3.33
100 4.76

6

(129)

MORNING

22 SEP 2022

[Total No. of Questions: 09]
Uni. Roll No.

[Total No. of Pages: 02]

Program: B.Tech. (Batch 2018)

Semester: 4th

Name of Subject: Computer Architecture and Microprocessor

Subject Code: PCIT-108

Paper ID: 16237

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

1. Parts A and B are compulsory
2. Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3. Any missing data may be assumed appropriately

Part – A

[Marks: 02 each]

1.

- a. What is an instruction code?
- b. Explain the role of control unit in memory.
- c. Define pipelining with suitable example.
- d. Differentiate software and hardware interrupt.
- e. Mention what are the basic components of a Microprocessor.
- f. Determine the number of clock cycles that it takes to process 200 tasks in a 6-segment pipeline.

Part – B

[Marks: 04 each]

2. Differentiate Direct Addressing and Indirect Addressing.
3. Illustrate applications of Microprocessor.
4. Compare Hardwired and Microprogrammed Control Unit.
5. Explain Status bit Register conditions in detail.
6. Non pipelined system takes 130ns to process an instruction. A program of 1000 instructions is executed in non-pipelined system. Then same program is processed with processor with 5 segment pipelines with clock cycle of 30 ns/stage. Determine speed up ratio of pipeline.
7. Explain Reduced Instruction Set Computer (RISC) and Complex Instruction Set Computer (CISC).

Part – C

[Marks: 12 each]

8. Explain different types of mapping processes

OR

Draw and explain microcontroller- 8051 architecture.

9. Explain various Addressing modes with suitable example of each.

OR

Demonstrate the flowchart of Instruction Pipeline.

MORNING

[Total No. of Questions: 09]
Uni. Roll No.

27 JUN 2023

[Total No. of Pages: 02]

Program: B.Tech. (Batch 2018)

Semester: 4th

Name of Subject: Computer Architecture and Microprocessors

Subject Code: PCIT-108

Paper ID: 16237

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

1. Parts A and B are compulsory
2. Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3. Any missing data may be assumed appropriately

Part - A

[Marks: 02 each]

Q1.

- a. Compare microcontroller with microprocessor.
- b. How many 128 Kb RAM chips are required to build 1Mb RAM?
- c. Differentiate direct and indirect address instructions.
- d. Elaborate LDA AC and Store AC instructions with syntax.
- e. Compare and contrast RISC and CISC architecture.
- f. Write 1-address and zero address instruction for the given expression $(A+B)*(C+D)$.

Part – B [Marks: 04 each]

Q2. Compare different types of instruction formats.

Q3. Write a short note on High-End-High- Performance Processors.

Q4. What is the need and significance of memory hierarchy? Also illustrate the memory hierarchy in order of their comparative analysis.

Q5. Illustrate Inter processor Communication in a shared multiprocessor environment.

Q6. If the value of R flip flop is 1, this means that the control will go through and an interrupt cycle. In such cases explicate the sequence of micro-operations that would occur. Draw the flow chart for interrupt cycle.

Q7. With the help of pin diagram, elaborate the functionality of each pin of 8051 microcontroller.

P.T.O.

PAGE 1 OF 2

MORNING

27 JUN 2023

Part – C

[Marks: 12 each]

Q8. Define microprocessor. Explain with the help of block diagram architecture of 8085 microprocessor in detail.

OR

Consider a pipeline having 4 phases with duration 60, 50, 90 and 80 ns. Given latch delay is 10 ns. Calculate-

1. Pipeline cycle time
2. Non-pipeline execution time
3. Speed up ratio
4. Pipeline time for 1000 tasks
5. Sequential time for 1000 tasks
6. Throughput

Q9.a) Write a program to perform subtraction operation for two 8-bit numbers.

b) Write a program to find 1's complement of 8-bit number.

OR

Elaborate the different types of addressing modes with help of examples.

Please check that this question paper contains 09 questions and 02 printed pages within first ten minutes.

[Total No. of Questions: 09]

Uni. Roll No.

[Total No. of Pages: 02]

Program: B.Tech. (Batch 2018 onward)

Semester: 4th

Name of Subject: Computer Architecture and Microprocessors

Subject Code: PCIT-108

Paper ID: 16237

Detail of allowed codes/charts/tables etc. Nil

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

- 1) Parts A and B are compulsory
- 2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
- 3) Any missing data may be assumed appropriately

Part – A

[Marks: 02 each]

Q1.

- a) Distinguish between register and memory.
- b) How many bits are required for 4096 words of memory?
- c) Point out the purpose of program counter.
- d) What do you meant by cycle stealing mode in DMA.
- e) List the advantages of assembly language.
- f) Write the meaning of LDA and LXI instructions.

Part – B

[Marks: 04 each]

- Q2. What is the need of control unit in computer? Draw the control unit of a basic computer. Discuss how fetch and decode phases are carried out.
- Q3. Write a program to exchange the data at 5000M and 6000M locations.
- Q4. Elaborate the various types of flag registers in 8085.
- Q5. Specify the applications of microprocessor in household, consumer/electronics and in medical sciences.
- Q6. Discuss the various types of interrupts in 8085 with an example of each.

Q7. How parallel processing works? Discuss the various types of parallel processors. MORNING
05 OCT 2023

Part - C

[Marks: 12 each]

Q8. Discuss the architecture of 8085 with the help of labelled diagram.

OR

Write the meaning and explanation of following instructions a) SIM b) CMP c) XRI
d) JC e) STA

Q9. Write an assembly language program to find maximum of two 8 bit numbers in 8085 microprocessor.

OR

Write an assembly language program to swap two 8-bit numbers stored in an 8085 microprocessor.

EVENING

20 JAN 2023

[Total No. of Questions: 09]

[Total No. of Pages: 02]

Uni. Roll No.

Program: B.Tech. (Batch 2018)

Semester: 4th

Name of Subject: Computer Architecture and Microprocessor

Subject Code: PCIT-108

Paper ID: 16237

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

1. Parts A and B are compulsory
2. Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3. Any missing data may be assumed appropriately

Part - A

[Marks: 02 each]

Q1.

- a. Compare operation code and operand with suitable example.
- b. Determine the number of clock cycles that it takes to process 300 tasks in a 6-segment pipeline.
- c. Differentiate software and hardware interrupt.
- d. Elaborate MOV and MVI instructions with suitable example of both.
- e. Define Embedded Systems.
- f. What do you mean by Cache Coherence?

Part B

[Marks: 04 each]

Q2. Compare 1-byte, 2-byte and 3-byte instructions.

Q3. Write an assembly language program to swap two numbers.

Q4. Differentiate Hardwired and Microprogrammed Control Unit

Q5. Elaborate the different phases of Instruction Cycle.

Q6. Explain Auxiliary Memory and its devices.

Q7. Discuss the various Memory Reference Instructions.

Part - C

[Marks: 12 each]

Q8. Explain how RISC and CISC architectures differ. Describe some major characteristics of RISC architecture.

OR

What is micro controller? Discuss the architecture of 8051 microcontroller.

Q9. Explain various Addressing modes with suitable example of each.

OR

Consider a pipeline having 4 phases with duration 60, 50, 90 and 80 ns. Given latch delay is 10 ns. Calculate-

1. Pipeline cycle time
2. Non-pipeline execution time
3. Speed up ratio
4. Pipeline time for 1000 tasks
5. Sequential time for 1000 tasks
6. Throughput

Please check that this question paper contains 9 questions and 2 printed pages within first ten minutes.

[Total No. of Questions: 09]

Uni. Roll No.

[Total No. of Pages: 02]

Program: B.Tech. (Batch 2018 onward)

Semester: 4th

Name of Subject: Computer Architecture and Microprocessors

Subject Code: PCIT-108

Paper ID: 16237

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

- 1) Parts A and B are compulsory
- 2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
- 3) Any missing data may be assumed appropriately

Part – A

[Marks: 02 each]

Q1.

- a) Differentiate between register and memory.
- b) What do you mean by cache coherence?
- c) What do you understand by programmed I/O?
- d) What is Interrupt?
- e) How RISC is different from CISC?
- f) How auxiliary memory is different from associative memory?

Part – B

[Marks: 04 each]

Q2. Discuss the different characteristics of multiprocessors.

Q3. Elaborate the function of timing and control unit in a basic computer.

Q4. Briefly discuss the steps followed in designing a CPU.

Q5. How pipelining improves performance of a microprocessor?

Q6. What is the need of microprocessor? How microprocessor is different from microcontroller?

Q7. Evaluate the different phases of instruction cycle.

Part - C

[Marks: 12 each]

Q8. Question Write a short note on

- a) Embedded System
- b) Virtual Memory

OR

Explain the architecture of 8051 with the help of labelled diagram.

Q9. Write a program in assembly language to find larger of two 8 bit numbers stored at different memory locations.

OR

What is the difference between a direct and an indirect address instruction? How many references to memory are needed for each type of instruction to bring an operand into a processor register?

[Total No. of Questions: 09]

Uni. Roll No. 21843T14

[Total No. of Pages: 02]

extern

Program: B.Tech. (Batch 2018)

Semester: 4th

Name of Subject: Computer Architecture and Microprocessors

Subject Code: PCIT-108

Paper ID: 16237

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

1. Parts A and B are compulsory
2. Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3. Any missing data may be assumed appropriately

Part - A

[Marks: 02 each]

Q1.

- a. Compare microcontroller with microprocessor.
- b. How many 128 Kb RAM chips are required to build 1Mb RAM?
- c. Differentiate direct and indirect address instructions.
- d. Elaborate LDA AC and Store AC instructions with syntax.
- e. Compare and contrast RISC and CISC architecture.
- f. Write 1-address and zero address instruction for the given expression $(A+B)*(C+D)$.

Part - B [Marks: 04 each]

Q2. Compare different types of instruction formats.

Q3. Write a short note on High-End-High- Performance Processors.

Q4. What is the need and significance of memory hierarchy? Also illustrate the memory hierarchy in order of their comparative analysis.

Q5. Illustrate Inter processor Communication in a shared multiprocessor environment.

Q6. If the value of R flip flop is 1, this means that the control will go through an interrupt cycle. In such cases explicate the sequence of micro-operations that would occur. Draw the flow chart for interrupt cycle.

Q7. With the help of pin diagram, elaborate the functionality of each pin of 8051 microcontroller.

P.T.O.

Part - C

[Marks: 12 each]

Q8. Define microprocessor. Explain with the help of block diagram architecture of 8085 microprocessor in detail.

OR

Consider a pipeline having 4 phases with duration 60, 50, 90 and 80 ns. Given latch delay is 10 ns. Calculate-

1. Pipeline cycle time
2. Non-pipeline execution time
3. Speed up ratio
4. Pipeline time for 1000 tasks
5. Sequential time for 1000 tasks
6. Throughput

Q9.a) Write a program to perform subtraction operation for two 8-bit numbers.

b) Write a program to find 1's complement of 8-bit number.

OR

✓ Elaborate the different types of addressing modes with help of examples.

QUESTION BANK OF COMPUTER ARCHITECTURE AND MICROPROCESSOR (CAM)

SECTION-B SYLLABUS

- 1) Differentiate between the basic architectures which microprocessor and microcontroller follows.
- 2) Elaborate the architecture of 8051 microcontroller with the help of block diagram.
- 3) With the help of pin diagram, elaborate the functionality of each pin of 8051 microcontroller.
- 4) What is the size of the internal memory in 8051 microcontroller? Can we interface external memory in microcontroller? If yes, what is its size?
- 5) How PSEN pin differs in functionality from RD/WR pins of microcontroller?
- 6) State the function of ALE pin.
- 7) Differentiate between microprocessor and microcontroller.
- 8) List the features of 8051.
- 9) Show and explain the interfacing of stepper motor with 8085 microprocessor.
- 10) Draw the block diagram of the architecture of the 8051. Explain the function of each block. X
- 11) Draw the circuit for interfacing external memory to 8051 and explain it.
- 12) Find the total number of cells in 64 Kb*8 memory chip?
- 13) Write a short note on
 - a. Main Memory
 - b. Auxiliary Memory
 - c. Cache Memory
- 14) Differentiate between Virtual Memory and Cache Memory.
- 15) With the help of applications, State how the use of microprocessor makes daily life easier.
- 16) Elaborate the Basic structure of an Embedded system. Also state the advantages and disadvantages of the embedded system.
- 17) Write a short note on High-End-High-Performance Processors.
- 18) Brief about the characteristics of Multiprocessor.
- 19) Differentiate between multiprocessor and multicomputer.
- 20) Explain the memory Hierarchy with the help of diagram.
- 21) Write short note on
 - a. ADC
 - b. DAC
- 22) How many 128*8 memory chips are required for the memory capacity of 4096*16?
- 23) Write a short note on interfacing of 8051 to LCD.
- 24) What do you understand by cache coherence Problem? Give an example.
- 25) State Word size with the help of an example.
- 26) How many 256MB RAM chips are required to build 4GB RAM?
- 27) Discuss the Memory Hierarchy in computer System with respect to Speed, Size and Cost?
- 28) Write about the Auxiliary memory devices.
- 29) Explain the mechanism involved in Magnetic Disks and Magnetic Tapes.
- 30) List out the importance for interfacing.
- 31) Explain Inter processor Communication in a shared multiprocessor Environment.

32) Explain in detail about

- a. Crossbar Switching
- b. Multistage Switching network
- c. Hypercube System

33) Explain how the parallel processing improves the performance of multiprocessing environment.

34) Classify the organization of computers using Flynn's Criteria.

35) Write about

- a. Time shared Common Bus
- b. Multiport Memory