ANDIJAN STATE PEDAGOGICAL INSTITUTE

Lecture materials · 2026–2027 academic year

SUBJECT

Information Systems and Digital Technologies

Para 14 · Midterm exam review

Topics 1–7

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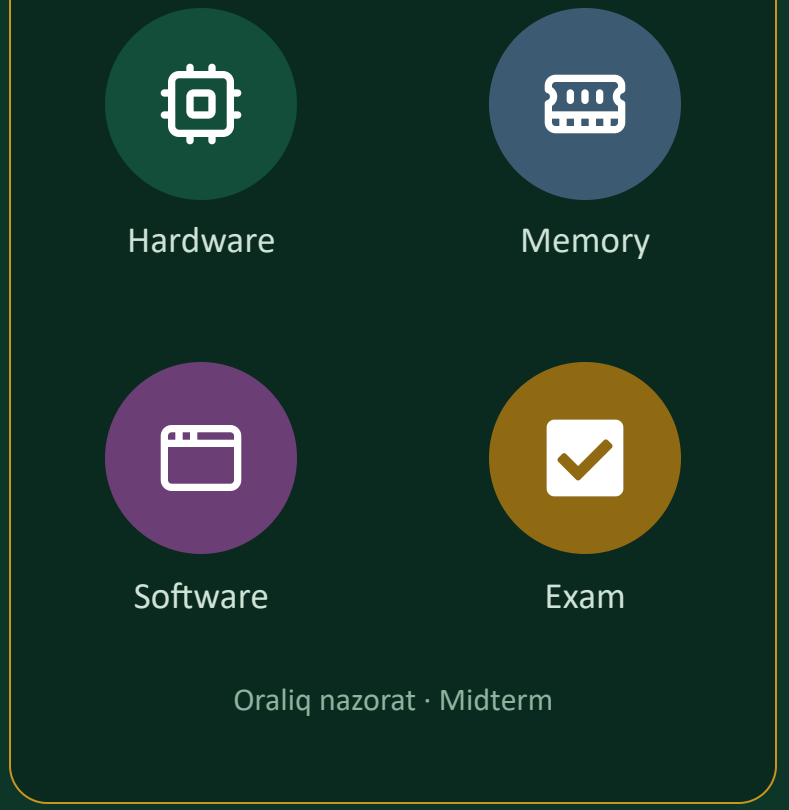
PARA 14 · MIDTERM REVIEW

FUNDAMENTALS OF COMPUTERS · WEEK 8

Midterm Exam Topics 1–7

Review the key ideas, practise the question types, and show what you know

hardware · memory · storage · software



How ready are you?

Rate yourself from 1 to 5 on each topic from weeks 1–7. Circle your strongest topic — and the one that needs the most work.



Think – Pair – Share (3 min)

1 Which topic is your strongest?

2 Which topic needs more practice?

3 Which question type worries you most?

By the end of this lesson, you can…

1. **Recall** the key terms and facts of Topics 1–7.
2. **Explain** how the CPU, memory, storage and input/output devices work together.
3. **Compare** related ideas: RAM and ROM, HDD and SSD, user and kernel mode, waterfall and incremental.
4. **Answer** multiple-choice, true/false, matching and short-answer questions with confidence.
5. **Plan** your revision and your time in the exam.

Seven topics on one page

1 · Computer basics

Computer literacy; characteristics and limits; history, generations, classification.

2 · Computer technology

CPU units and registers; buses; machine cycle; CISC/RISC; von Neumann and Harvard.

3 · Input and output

Keyboard, pointing devices, scanners; monitors, printers, plotters, projectors.

4 · Primary memory

Purpose of memory; hierarchy; RAM (SRAM, DRAM) and ROM types; capacity units.

5 · Data storage

Magnetic, optical, magneto-optical, solid-state; inside an HDD; HDD vs SSD.

6 · Operating systems

Functions and services; processes; files; drivers; dual mode; types; open source.

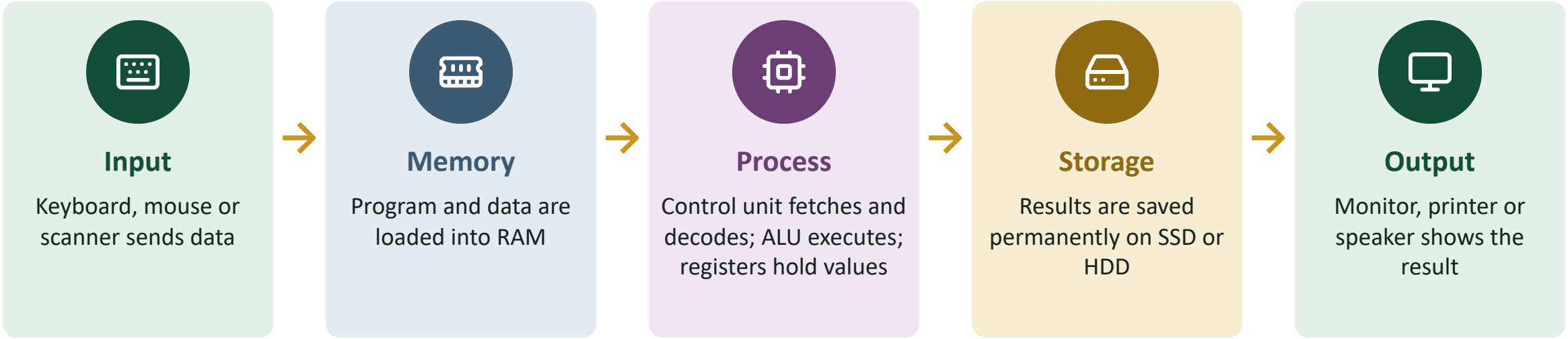
7 · Software and SDLC

Software families; application types; algorithms and flowcharts; SDLC; waterfall vs incremental.

How to revise

Reread each lesson’s review slide, then redo its activities and final challenge.

How a computer works: from input to output



Remember for Topic 1

Generations: vacuum tubes → transistors → ICs → microprocessor → ULSI.

Six characteristics: speed, storage, accuracy, reliability, versatility, diligence.

Remember for Topic 2

Machine cycle: fetch → decode → execute → store.

Buses: data, address, control. Von Neumann: one memory for program and data.

Input and output devices

Keyboard

Alphanumeric, function, numeric, cursor and special keys.

Pointing devices

Mouse, trackball, joystick, light pen, touch screen.

Scanning and recognition

Image scanners; OCR, OMR, MICR, bar-code readers.

Media input

Digital cameras, microphones, voice recognition, sensors.

Monitors

CRT, LCD, TFT; today LED-backlit LCD and OLED.

Printers

Impact: dot matrix, daisy wheel, drum. Non-impact: ink-jet, laser.

Plotters

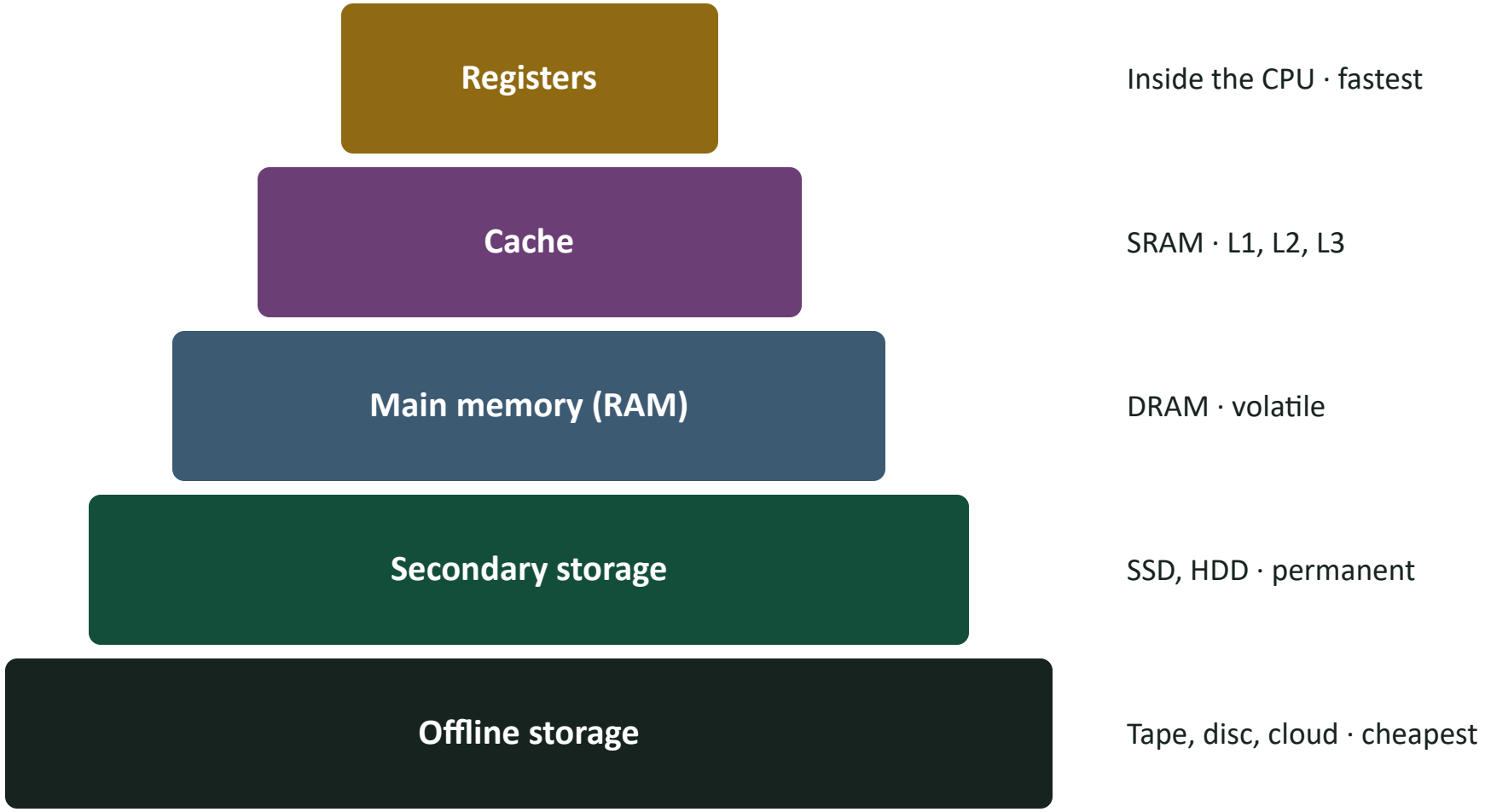
Drum, flat-bed, ink-jet and electrostatic — for large drawings.

Projectors and voice

LCD, DLP and laser projectors; voice output systems.

Memory and storage: the hierarchy

faster · smaller · costlier



Inside the CPU · fastest

SRAM · L1, L2, L3

DRAM · volatile

SSD, HDD · permanent

Tape, disc, cloud · cheapest

slower · bigger · cheaper

CHECK FOR UNDERSTANDING

Hardware quick fire

A	The part of the CPU that does arithmetic and comparisons.
B	The bus that carries memory locations, one way from the CPU.
C	A printer that can make carbon copies of invoices.
D	The device that reads pencil marks on an answer sheet.
E	Memory that must be refreshed thousands of times a second.
F	Time spent waiting for the sector to spin under the head.

Key words

- ALU
- address bus
- dot matrix
- OMR
- DRAM
- rotational latency

Operating systems in six cards

Five functions

Process, memory, file, device and security management.

Services

UI, program execution, I/O, files, communication, errors, resources, protection.

Processes

States, PCB, scheduling (FCFS, SJF, priority, round robin), deadlock.

Dual mode

User mode (bit 1) vs kernel mode (bit 0); system calls.

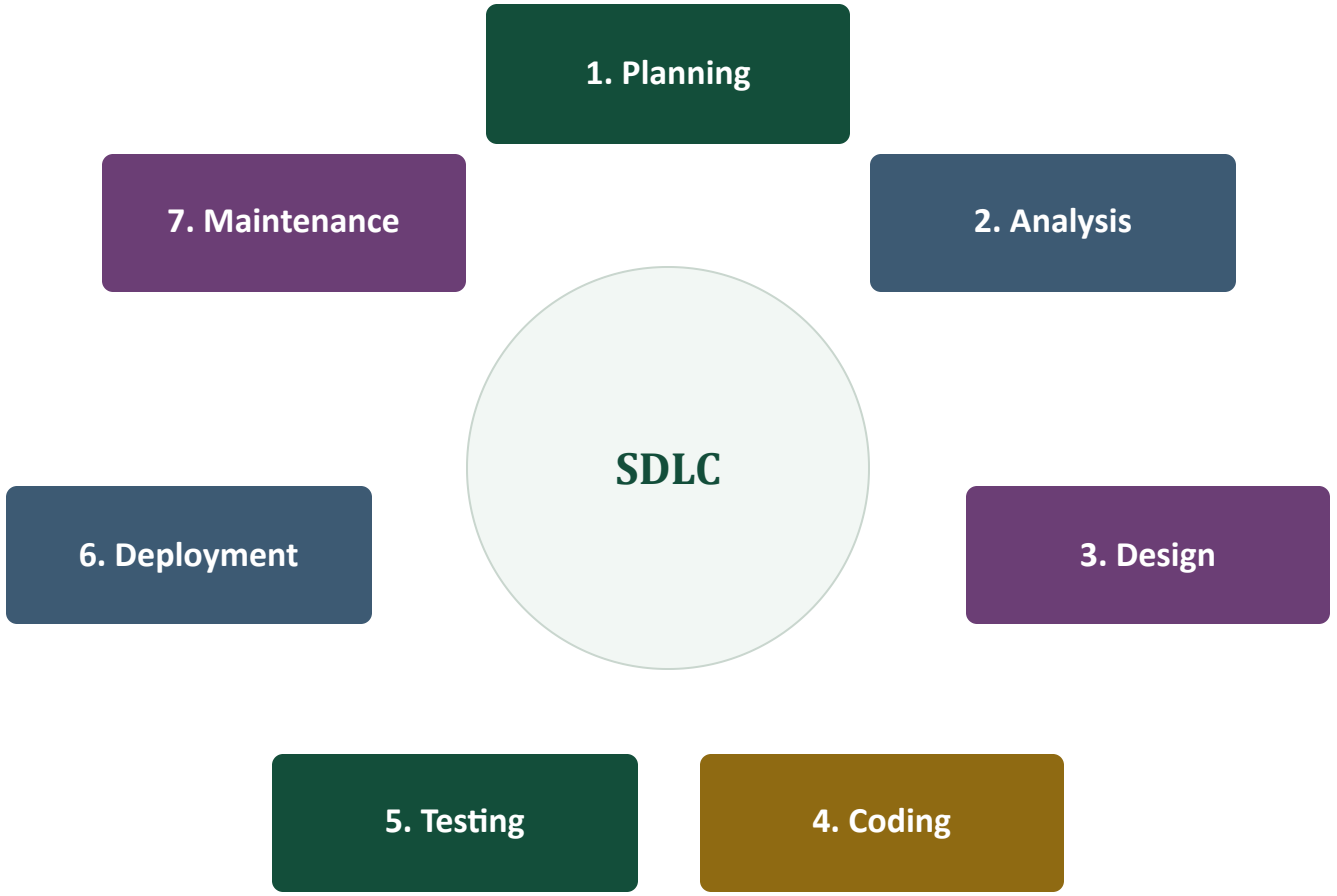
Device drivers

Translate OS requests into commands for one device.

Types and open source

Batch, time-sharing, real-time…; GUI vs CLI; Linux vs Windows.

Software and the SDLC



Also remember

System software: OS, utilities, drivers, translators

Application software: standard and unique; desktop, web, mobile

Compiler vs interpreter; linker; debugger

Algorithm, flowchart, pseudocode

Sequence, selection, repetition

Waterfall: one phase after another

Incremental: working parts, early feedback

CHECK FOR UNDERSTANDING

Software quick fire

01 A program that translates a whole program into machine code before it runs.

02 The flowchart symbol for a decision (yes/no).

03 A process waits for a printer held by another process that waits for it.

04 The mode in which an app like a browser runs.

05 The SDLC phase in which bugs are found and fixed before release.

06 The model that releases a basic version first, then adds features.

Choose from:

- Compiler
- Diamond
- Deadlock
- User mode
- Testing
- Incremental

Four question types — and how to answer them

TYPE	Example	Tip
Multiple choice	Which memory is volatile? A ROM B RAM C DVD D Flash	Cross out the answers you know are wrong first.
True / false	“An SSD has moving read/write heads.”	One wrong word makes it false — read every word.
Matching	Match OCR, OMR, MICR to cheque, answer sheet, printed page.	Do the pairs you are sure of first.
Short answer	“The smallest, fastest memory inside the CPU is the _____.”	Use the exact term and spell it correctly.

Before and during the exam

✓ DO

- Revise a little every day this week
- Redo each lesson’s final challenge
- Read every question twice
- Answer the easy questions first
- Keep 5 minutes to check your answers

✗ DON’T

- Try to learn everything the night before
- Leave a multiple-choice answer blank
- Spend too long on one hard question
- Change an answer without a good reason
- Bring your phone to the desk

Review: can you answer these?

01 Name the three buses and what each carries.

02 Give the four steps of the machine cycle.

03 Impact vs non-impact printer: one example of each.

04 Why is cache faster than RAM, and why is it small?

05 List the parts of a hard disk drive.

06 Function vs service of an OS: one example of each.

07 What happens when an app makes a system call?

08 When would you choose the waterfall model?

Exit ticket

Answer on a slip of paper before you leave.

1. Which two topics will you revise first, and which activities will you use?

2. Write one question you think will be on the exam — and its answer.

3. Score yourself on activity 05 (practice midterm) tonight: __ / 20.