Chapter # 8

Chapter 8 – Maintenance and Repair of Keyboard

✅ Part I: Short Questions

Q1. Describe basic working of a keyboard.

- A keyboard works on a **matrix of rows and columns** where each key press closes a circuit.
- The **controller chip** detects which key is pressed, converts it into a scan code, and sends it to the CPU.

Q2. Define concept of rows and columns to form a matrix of key positions.

- Keys are arranged in **row and column wires**.
- When a key is pressed → the row and column intersect → creating a signal.
- This reduces the number of wires needed inside the keyboard.

Q3. Identify keyboard matrix, controller chip, 5-pin connector.

- **Keyboard matrix:** Grid of rows and columns that detect keypresses.
- **Controller chip:** Converts keypress into digital signal (scan code).
- **5-pin connector:** Old-style DIN connector used before PS/2 and USB.

Q4. Clean dirty key contacts.

- Remove keycaps carefully.
- Use compressed air or isopropyl alcohol with a cotton swab.
- Ensure contacts are dry before reassembling.

✅ Part II: Long Questions

Q1. Describe functions of signals between the CPU and keyboard.

- **Keyboard → CPU:** Sends scan codes when keys are pressed or released.
- **CPU → Keyboard:** Sends commands like reset, LED control (Num Lock, Caps Lock).
- Communication occurs through the system's **I/O controller** using interrupts.

Q2. Assemble keyboard.

1. Place the PCB (printed circuit board) into the casing.
2. Fit the rubber dome or mechanical switches over the PCB.
3. Install keycaps in correct positions.
4. Reconnect controller board.
5. Close the casing and test functionality.

Q3. Disassemble keyboard.

1. Disconnect from PC.

2. Remove screws on back panel.
3. Open casing carefully.
4. Take out PCB, controller chip, and key matrix.
5. Remove keycaps if required.

Extra Important Questions

Q1. Differentiate between mechanical and membrane keyboards.

- **Mechanical:** Uses individual switches, durable, tactile feedback.
- **Membrane:** Uses pressure pads, quieter, cheaper, less durable.

Q2. What is a scan code?

- A code sent by the keyboard to the CPU indicating which key is pressed/released.

Q3. What is debounce in keyboards?

- A process to filter out noise when a key is pressed so that only one input is registered.

Q4. What is ghosting in keyboards?

- When pressing multiple keys causes unintentional extra key signals.

Q5. Preventive maintenance of keyboards.

- Keep away from dust and liquids.
- Use protective keyboard covers.
- Clean regularly with compressed air.