



IR (Infrared) Touchscreen Sensor – 16 Marks Answer

◆ 1. Introduction

- An **IR touchscreen** (Infrared touchscreen) uses **infrared light beams** to detect touch.
 - It is a **non-contact** touchscreen technology—does **not require pressure** or conductive touch (like fingers).
 - Commonly used in **ATMs, kiosks, large displays**, and **interactive boards**.
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◆ 2. Construction

- A frame around the display holds:
 - **IR LED emitters** on one side.
 - **IR photodetectors** (receivers) on the opposite side.
 - Both X and Y axes are covered by a **grid of invisible IR beams**.
 - No overlay on the screen—optical detection is done around the frame.
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◆ 3. Working Principle

1. IR LEDs emit a **grid of infrared light** across the screen surface.
 2. The light travels from **one side to the opposite** where receivers are placed.
 3. When a finger or object touches the screen, it **blocks some IR beams**.
 4. The blocked beams identify the **X and Y coordinates** of the touch.
 5. A controller processes the data and sends the **touch location** to the system.
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◆ 4. Diagram Description

- A rectangular screen with:
 - **IR LED emitters** on top and left.
 - **IR detectors** on bottom and right.
 - A **finger blocking IR beams** at a point.
- Labeled: Emitters, Detectors, Infrared Beams, Touch point.

Caption: *Working of IR Touchscreen – detection through blocked light beams.*

◆ 5. Properties / Characteristics

- **No physical contact required** (can use finger, stylus, glove).
- Works with **any opaque object**.
- **High durability** – no layers to wear out.

- **Resistant to scratches.**
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◆ 6. Applications

- **ATMs and ticket kiosks**
 - **Interactive whiteboards**
 - **Self-service terminals**
 - **Hospital equipment** (where gloves are worn)
 - **Industrial machines**
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◆ 7. Advantages

- **Long lifespan** – no mechanical parts to wear.
 - Works with **gloves or stylus**.
 - **High clarity** – no screen overlay.
 - **Multi-touch** support in some models.
 - Easy to maintain and clean.
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◆ 8. Disadvantages

- **Affected by strong sunlight** or **dust** on the frame.
 - **Expensive** compared to resistive touchscreens.
 - Frame-based system increases **thickness and weight**.
 - Limited precision in detecting very small touch points.
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◆ 10. Summary

- IR touchscreen uses **infrared light grid** to detect touch.
 - Works by detecting **interruption of light beams** across screen.
 - Offers **high durability, multi-touch, and non-contact sensing**.
 - Widely used in **public interfaces**, and suitable for **harsh environments**.
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