

**Project Title:****GATE Calculator Browser Extension**

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**Problem Statement:**

During GATE (Graduate Aptitude Test in Engineering) preparation, students often practice using mock tests, online PDFs, and browser-based resources. However, the actual GATE exam provides a custom-built on-screen scientific calculator, which differs significantly from standard system or mobile calculators.

There is currently no lightweight, easily accessible browser tool that replicates the GATE scientific calculator's interface and functionality in a seamless overlay format. This lack of familiarity can hinder a student's efficiency during the actual examination.

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**Objective:**

To develop a browser extension that replicates the official GATE scientific calculator, functioning as a floating overlay on any webpage. This tool will help students practice in a real-exam-like environment, improving their speed, accuracy, and familiarity with the calculator interface.

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**Key Features:****1. GATE Calculator Interface**

- Pixel-perfect replication of the official GATE scientific calculator layout
- All scientific functions including trigonometric, logarithmic, exponential, and memory functions

**2. Floating Overlay Mode**

- Displayed as a draggable, resizable overlay on top of any webpage
- Maintains visibility while the user practices on online portals or reads PDFs

**3. Trigger Mechanism**

- Activated via browser extension icon or keyboard shortcut (e.g., Ctrl+Shift+G)
- Can be hidden or closed without affecting browser session

#### 4. Modes and Precision

- Degree/Radian toggle
- Expression evaluation with operator precedence
- Memory functions (MC, MR, MS, M+, M-)

#### 5. Responsive and Theme Support

- Light and dark mode support
- Works on both desktop and laptop browsers (Chrome and Firefox)

#### 6. No External Dependencies at Runtime

- Works entirely within the browser with no server-side interaction
  - Ensures privacy and offline accessibility
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#### Tech Stack:

##### Frontend:

- **HTML5** – For semantic layout
- **CSS3 (Flexbox/Grid)** – For styling and layout
- **JavaScript (Vanilla or with math.js)** – For calculator logic and UI interaction

##### Extension Platform:

- **Chrome Extensions (Manifest V3)**
- **Firefox Add-ons (WebExtension API)**

##### Optional Libraries/Tools:

- **math.js** – For accurate scientific calculation parsing (optional)
  - **dragula.js** or custom drag logic – For draggable overlay
  - **localStorage** or **chrome.storage.local** – For persistent memory state (optional)
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#### Folder Structure (Example):

gate-calculator-extension/

```
└─ manifest.json
└─ popup.html
└─ popup.css
└─ popup.js
└─ overlay.html
└─ overlay.css
└─ overlay.js
└─ icons/
  └─ icon128.png
└─ assets/
  └─ gate_calculator_reference.png
```

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#### **Future Enhancements:**

- Customizable hotkeys
  - Mode to simulate exact screen dimensions and interaction of actual GATE exam
  - Integration with popular test platforms for seamless access
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#### **Benefits:**

- Helps students build muscle memory for the GATE exam calculator
  - Removes dependency on tab switching or system calculators
  - Enhances exam-like practice experience directly in the browser
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