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Practical - 01.

* **Aim:** Installation of Metamask and study spending ether per transaction.

* **Theory:**

1] **Metamask. -**

- Metamask is a free, open source wallet and browser extension that lets users interact with the ethereum blockchain and store ETH and tokens.
- It is available as a browser extension for chrome, Firefox, edge, brave and as a mobile app for android and Ios.
- It provides a built in interface to send / recieve funds, connect to dApps, and sign transactions securely.

2] **Installation steps:**

1. Visit metamask.io (official site).
2. Click download / install and select your browser or mobile platform.

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3. Add the extension to the browser or install the app from the official store.

4. Create a new wallet, set a strong password, and securely store the secret recovery phrase 12 words offline.

5. Fund the wallet with a small amount of ETH for testing transactions.

6. Security tips - always verify the publisher, keep your seed phrase private and consider a hardware wallet for large holdings.

3] Ether spending per transaction -

- Every ethereum transaction consumes gas, which is a measure of computational work.
- Transaction fee (in ETH) = Gas used × Gas price (in gwei) $\times 10^{-9}$.
- After EIP-1559, the fee consists of a base fee (burned) + priority tip (to validators)
- Typical gas used for a simple ETH transfer = 21000 units.

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- Gas price fluctuates based on network demand (quoted in gwei).
- Fee in fiat = Transaction fee (ETH) × Current ETH Price (USD / INR).
- Users can view the estimated fee before sending in Metamask and the exact fee after sending by clicking View on Etherscan.

4] How to study ETH spend -

- Send a small test transaction from your Metamask wallet
- In metamask, open the transaction details and click view on Etherscan.
- On etherscan note -
  - Gas used by transaction.
  - Gas price / effective gas price.
  - Transaction fee in ETH and USD (displayed automatically).
- Apply the formula to calculate or verify the fee yourself.
- Use gas trackers (eg. Etherscan gas tracker to compare fees at different times.

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- Try layer 2 networks (optimism, Arbitrum) for lower fees.

* CONCLUSION:

Metamask was successfully installed and set up, providing a secure interface to interact with the ethereum blockchain. By observing a sample transaction in Metamask and on etherscan, the ether spent per transaction can be accurately measured using the formula fee = Gas used × gas price $\times 10^{-9}$ ETH.

This allows users to estimate and minimize transaction costs. (by adjusting gas price, timing or using layer 2 networks).