W06 MEV Workshop: Self-Check Quiz

Format. 10 multiple-choice questions covering learning objectives LO1 to LO5. Self-check; not graded. The answer is shown below each question. Read the question first, decide your answer, then check.

Coverage: LO1 (Q1, Q3), LO2 (Q2, Q4), LO3 (Q5, Q6), LO4 (Q7, Q8), LO5 (Q9, Q10).

Q1. The mempool (memory pool) is best described as:

(a) A permanent database of confirmed transactions

(b) A public queue of pending transactions waiting to be included in a block

(c) A smart contract that routes trades to validators

(d) A type of crypto wallet used by validators

Answer: (b) A public queue of pending transactions waiting to be included in a block. The mempool is the holding area where broadcast transactions sit before a validator selects and orders them into a block. It is public by default so that any validator can see what is available.

Q2. In a sandwich attack, the ordering of the searcher's transactions relative to the victim's trade is:

(a) One transaction before the victim's trade, one after

(b) Two transactions before the victim's trade

(c) Two transactions after the victim's trade

(d) Random; the searcher just bids higher gas

Answer: (a) One transaction before the victim's trade (the front-run, which buys ahead of the victim and pushes the price up) and one after (the back-run, which sells at the higher post-victim price). The victim's trade is literally sandwiched between the two bot transactions, giving the attack its name.

Q3. MEV stands for:

(a) Most Expensive Variable

(b) Maximal Extractable Value

(c) Multi-Entity Validation

(d) Mempool Execution Vector

Answer: (b) Maximal Extractable Value (originally Miner Extractable Value, renamed after Ethereum's move to proof-of-stake). It refers to the value that can be captured by controlling the ordering of transactions within a block, beyond standard block rewards and fees.

Q4. A sandwich attack on a \$50,000 swap with 1% slippage tolerance can extract up to approximately:

(a) \$5

(b) $50

(c) $500

(d) $5,000

Answer: (c) Approximately $500. The slippage tolerance sets the ceiling: 1% of $50,000 is $500. The actual bot profit is $500 minus the gas cost of the two extra transactions (front-run and back-run). Wider slippage means higher extraction potential; narrower slippage reduces it.

Q5. The correct order of the MEV pipeline is:

(a) User, validator, builder, searcher

(b) Searcher, builder, validator, user

(c) User, searcher, builder, validator

(d) Searcher, validator, builder, user

Answer: (c) User submits a transaction to the public mempool. The searcher detects the opportunity and constructs a bundle. The builder assembles a block containing the bundle. The validator (proposer) selects the highest-paying block from the relay and proposes it. The user's transaction is confirmed, sandwiched as intended.

Q6. Setting a 1% slippage tolerance on your swap:

(a) Fully protects the user from sandwich attacks

(b) Sets the maximum the bot can extract as a fraction of the trade size

(c) Makes the trade execute faster by paying higher gas

(d) Saves gas by reducing computation

Answer: (b) The slippage tolerance sets the maximum price deviation the user accepts before the transaction reverts. This is the ceiling on sandwich extraction: the bot cannot push the price beyond what the victim's slippage allows, or the victim's transaction reverts and the attack fails. It limits exposure but does not eliminate the attack.

Q7. Flashbots Protect breaks the sandwich attack because:

(a) It encrypts the transaction so no one can read it

(b) It routes the transaction through a private mempool that searcher bots watching the public mempool cannot see

(c) It pays the searcher a fee to ignore the transaction

(d) It delays the transaction until gas prices fall

Answer: (b) Flashbots Protect is a private RPC (Remote Procedure Call interface) that sends your transaction directly to a Flashbots-connected builder, bypassing the public mempool. Searcher bots that scan the public mempool never see the transaction before it is confirmed. The limitation: you trust Flashbots as the provider.

Q8. CoW Swap (batch auction) breaks the sandwich because:

(a) All trades in a batch settle at the same uniform clearing price, so no individual trade can be sandwiched within the batch

(b) It is faster than Uniswap, leaving no time for bots

(c) It costs less gas, making attacks unprofitable

(d) It uses a centralized exchange order book to match trades

Answer: (a) In a batch auction, all trades are collected over a short window and executed at a single uniform clearing price. Because every trade in the batch receives the same price, there is no price impact from any individual trade for a bot to exploit. The sandwich attack has no entry point. This is a structural fix, not just a visibility fix.

Q9. The "dark forest" analogy describes:

(a) The public mempool as a hostile environment where bots hunt any transaction that becomes visible

(b) Tor onion routing used to anonymize blockchain transactions

(c) The opacity of Bitcoin mining pool fee arrangements

(d) A category of Solidity smart contract vulnerability

Answer: (a) The dark forest idiom (from Liu Cixin's 2008 science-fiction novel of the same name) was applied to the mempool by Ethereum researcher Dan Robinson in a 2020 essay. The metaphor: any transaction visible in the public mempool is like a signal of existence in a dark forest. Predator bots detect the signal and attack before the transaction can protect itself.

Q10. The "MEV as auction" defense argues that:

(a) MEV is an involuntary tax on retail users who did not consent to it

(b) MEV is the price the market pays for an open, permissionless system with competitive block production

(c) MEV does not exist and the losses attributed to it are just normal slippage

(d) MEV will be banned by regulators within two years

Answer: (b) The auction argument: permissionless systems require open mempools, and open mempools attract competition. Searchers bidding up gas returns value to validators and stakers. Arbitrage MEV aligns prices across DEXes. Liquidation MEV keeps lending protocols solvent. The tax argument (answer a) is the opposing view: MEV is an involuntary transfer from retail to professionals. W06 presents both sides; neither is objectively settled.

End of self-check quiz. Total: 10 questions, 5 LOs covered.