

# CSIT 6000Q- Blockchain and Smart Contracts

Question-related to important concepts in Solidity

November 25, 2023

## 1 Question 1

What is an Ethereum smart contract?

## 2 Question 2

What makes an Ethereum smart contract so special compared to other programs?

## 3 Question 3

Can a smart contract interact with other smart contracts?

## 4 Question 4

Can a Solidity smart contract call an API on the web?

## 5 Question 5

Can a Solidity smart contract store a lot of data?

## 6 Question 6

Can a smart contract be written in another language than Solidity?

## 7 Question 7

Is Solidity a dynamically or statically typed language? (i.e need to define variable types)

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## 9 Question 9

Is Solidity compiled or interpreted?

## 10 Question 10

What is the file extension of Solidity files?

## 11 Question 11

What is the typical layout of a Solidity smart contract?

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## 13 Question 13

What is the problem with the following code

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## 15 Question 15

What are the 2 variable visibilities for state variables in Solidity?

## 16 Question 16

Who can read private and public variables?

## **17 Question 17**

What is the default visibility of state variables?

## **18 Question 18**

Are private variables really private?

## **19 Question 19**

How to deal with private data then?

## **20 Question 20**

Mention 3 data types that you use often, and explain why?

## **21 Question 21**

What are the 2 container types in Solidity?

## **22 Question 22**

How to declare an array of integer in Solidity?

## **23 Question 23**

How to declare a mapping of address to booleans in Solidity?

## **24 Question 24**

How to declare a mapping of address to mapping of address to booleans (nested mapping)?

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## 26 Question 26

How to add data to an array declared as a state variable?

## 27 Question 27

How to add data to a mapping declared as a state variable?

## 28 Question 28

How to loop through an array?

## 29 Question 29

What is the difference between a uint8 and a uint16?

## 30 Question 30

What are the 4 function visibilities in Solidity, by increasing permissiveness?

## 31 Question 31

How to conditionally throw an error, with an error message?

## 32 Question 32

What are the 2 artifacts produced by the Solidity compiler when compiling a smart contract?

## 33 Question 33

What is the ABI of a smart contract?

## 34 Question 34

In the following contract, which function will be part of the ABI?

### **35 Question 35**

Does the EVM understands Solidity?

### **36 Question 36**

What is the EVM bytecode?

### **37 Question 37**

What are the 2 APIs used to interact with a smart contract?

### **38 Question 38**

What is gas?

### **39 Question 39**

How is gas paid?

### **40 Question 40**

What happens if there is not enough gas in a transaction?

### **41 Question 41**

Who pays for gas in a transaction?

### **42 Question 42**

What do you need to deploy a smart contract to the Ethereum network?

### **43 Question 43**

List 4 famous Ethereum wallets

## **44 Question 44**

List 3 networks where you can deploy a Solidity smart contract

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## **47 Question 47**

How to manage dates in Solidity?

## **48 Question 48**

How to have the current timestamp in seconds?

## **49 Question 49**

What are the 2 ways to define custom data structure in Solidity?

## **50 Question 50**

When would you use a struct vs an enum?

## **51 Question 51**

What are the 2 ways to instantiate a struct?

## **52 Question 52**

How to instantiate a struct that has an inner mapping?

### **53 Question 53**

When would you use an array vs a mapping?

### **54 Question 54**

How to combine array and mapping to allow both iteration and rapid lookup of a struct?

### **55 Question 55**

How to define an in-memory array of 3 integers?

### **56 Question 56**

How to add a value to an in-memory array?

### **57 Question 57**

How to create an in-memory mapping?

### **58 Question 58**

What happen if you try to access the key of a mapping that does not exist?

### **59 Question 59**

What are the 3 mechanisms for code re-use in Solidity?

### **60 Question 61**

How to make a contract A inherit from a contract B in Solidity?

### **61 Question 62**

If A inherit from B, and both define the same function foo, which one will be resolved?

## 62 Question 63

What are the 4 memory locations of Solidity?

## 63 Question 62

If A inherit from B, and both define the same function foo, which one will be resolved?

## 64 Question 63

What is the default visibility of state variables?

## 65 Question 64

What is the difference between address and address payable?

## 66 Question 66

Is it necessary to make an address address payable to transfer ERC20 tokens?

## 67 Question 67

Give 3 ways to save gas

## 68 Question 68

How would optimally order uint128, bytes32 and another uint128 to save gas?

## 69 Question 69

How would optimally order uint128, bytes32 and another uint128 to save gas?

## 70 Question 70

How to concatenate 2 strings a, b?



## **71 Question 71**

How to get the length of a string in solidity?

## **72 Question 72**

How to to create a smart contract from a smart contract?

## **73 Question 73**

How to to call another smart contract from a smart contract?

## **74 Question 74**

How to get the address of a smart contract that was deployed from a smart contract?

## **75 Question 75**

What will be the value of msg.sender if a contract calls another one?

## **76 Question 76**

How to transfer ERC20 tokens?

## **77 Question 77**

How to declare and emit an event?

## **78 Question 78**

What is the indexed keyword in event definition?

## **79 Question 79**

Is it possible for a smart contract to read the events emitted before?

## 80 Question 80

Is it possible to delete or modify a past event?

## 81 Question 81

How would you implement access control without modifier?

## 82 Question 82

How would you implement access control WITH modifier?

## 83 Question 83

How to cancel a transaction?

## 84 Question 84

Is it possible to send a transaction without requiring users to pay gas?

## 85 Question 85

Which Solidity function would you use to verify a signature?

## 86 Question 86

What is a library in Solidity?

## 87 Question 87

Give an example of how to use a library in a smart contract

## 88 Question 88

When is a library embedded vs deployed?

## **89 Question 89**

When is a library embedded vs deployed?

## **90 Question 90**

What is a re-entrancy attack?

## **91 Question 91**

How to prevent against a re-entrancy attack?

## **92 Question 92**

How to produce a hash of multiple values in Solidity?

## **93 Question 93**

How to generate a random integer in Solidity?

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## **95 Question 95**

How to declare assembly code?

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