Q) write a program to create a mining function and test it?

import hashlib

import time

def mine(block\_number, transactions, previous\_hash, prefix\_zeros):

    prefix\_str = '0' \* prefix\_zeros

    nonce = 0

    while True:

        # Create the data string by concatenating block number, transactions, previous hash, and nonce

        data = str(block\_number) + transactions + previous\_hash + str(nonce)

        # Calculate the hash of the data string

        hash\_result = hashlib.sha256(data.encode()).hexdigest()

        # Check if the hash starts with the required number of leading zeros

        if hash\_result.startswith(prefix\_str):

            print(f"Successfully mined a block with nonce: {nonce}")

            return hash\_result

        nonce += 1

# Test the mining function

if \_\_name\_\_ == "\_\_main\_\_":

    block\_number = 1

    transactions = "Alice pays Bob 10 BTC"

    previous\_hash = "0000000000000000000000000000000000000000000000000000000000000000"

    prefix\_zeros = 4  # Number of leading zeros required

    print("Mining in progress...")

    start\_time = time.time()

    mined\_hash = mine(block\_number, transactions, previous\_hash, prefix\_zeros)

    end\_time = time.time()

    print(f"Mined hash: {mined\_hash}")

    print(f"Time taken: {end\_time - start\_time} seconds")