

Week 9 Practice Questions

Q1: Which of the following statements is true?

- A. It is not possible to achieve concurrency without parallelism.
- B. It is not possible to write a synchronous program in the JavaScript language.
- C. A process can lead to the creation of multiple threads.
- D. None of the above

Answer: C

Solution: Concurrency can be achieved without parallelism via context switching in a single core environment.

JavaScript is a single threaded language, and it has only one call stack to execute the statements written in the program.

Q2: Which of the following is/are the disadvantages of point-to-point or many-to-many communication between servers?

- A. There are too many connections.
- B. The scaling becomes very difficult in such architectures.
- C. There may be connections, which are never used at all.
- D. All of the above

Answer: D

Solution: The point-to-point communication requires n^2 (where n is the number of servers) connections in the network. There may be a few connections, which are never used in the entire flow. The addition of a new server in such a network becomes difficult, as it requires to be connected to every other server in the network (i.e., n more connections).

Q3: Which of the following statements is false?

- A. Redis uses RESP protocol for communication between the client and the server.
- B. A Redis server uses the port number 6379 by default.
- C. Redis was primarily designed to be a message queue.
- D. None of the above

Answer: C

Solution: Redis uses RESP protocol and operates on port number 6379 by default. Redis was primarily designed to be an in-memory database.

Q4: Which of the following is/are good in terms of giving a better user experience?

- A. The use of blocking (non-threaded) web servers.
- B. The use of threaded web servers.
- C. The use of separate dedicated machine(s) for performing asynchronous computing intensive tasks.
- D. All of the above

Answer: B and C

Solution: As far as the user experience is concerned, the threaded web servers should be used. Not only that, almost all the high computing tasks should be dispatched to other servers (especially meant for this) asynchronously.

Q5: Which of the following is/are general principles for task queues?

- A. Pushing a task onto a queue should be faster than executing the task.
- B. There need not be enough worker resources to empty the queue eventually.
- C. It should be used for the tasks, which do not require an immediate response.
- D. All of the above

Answer: A and C

Solution: Pushing a task in task queue should be faster than processing the task. And there should be sufficient worker to process the task. Task queue is used to process the task which does not require immediate response because it will be processed later.

Q6: Which of the following is correct regarding message queue?

- A. It allows different parts of a distributed application to process messages asynchronously.
- B. Parts that queue the messages are called producers.
- C. Parts that dequeue the messages are called consumers.
- D. Parts that dequeue the messages are called producers.

Answer: A, B, C

Solution: The producer pushes the message in the message queue and a consumer can process the message as he gets free. This way the communication becomes asynchronous because the producer does not wait for the response. It keeps pushing the message in the message queue.

Q7: Which of the following is correct regarding “Event-Driven” architecture?

- A. An event driven architecture uses events to trigger communication between decoupled services.
- B. The service that publish the event is called producer.
- C. The service that filters and pushes the events to the consumers is called producer.
- D. The service that filters and pushes the events to the consumers is called the router.

Answer: A, B and D

Solution: In an event driven architecture, event producer produce the event and router does the processing like filtering and then pushes it to event consumer.

Q8: Which of the following statement(s) is/are true regarding publisher/subscriber messaging?

- A. Each message can be consumed by multiple receivers (assuming there are more than 1 receiver).
- B. Each message can be consumed only by one receiver (assuming there are more than 1 receiver).
- C. Message sender may not know the receiver
- D. Message sender must know the receiver.

Answer: A, C

Solution: In pub/sub messaging, a message can be received by multiple subscriber. Message sender does not have to know about the receivers.