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VICTORIA UNIVERSITY OF  
**WELLINGTON**  
TE HERENGA WAKA

**EXAMINATIONS – 2022**  
**TRIMESTER II**

**NWEN304**

**Advanced Network Applications**

**Time Allowed:** 50 MINUTES

**CLOSED BOOK**

**Permitted materials:** Only silent non-programmable calculators or silent programmable calculators with their memories cleared are permitted in this test. No electronic dictionaries are allowed.

**Instructions:** There are three sections:

- SECTION A - True/False [10 marks]
- SECTION B - Multiple Choice [20 marks]
- SECTION C - Short Answers [20 marks]

**The test consists of 50 marks in total.**

**You must write your answers in the boxes provided within the questionnaire.**

## SECTION A State True or False (10 marks)

**Instructions:** There are 5 questions in this section. Each question is worth 2 marks.

1. The term “scaling out” refers to adding more servers to an application.

- a. True
- b. False

2. Requests in *Stateful* applications are self-contained, i.e. everything is contained within the request, while requests in *Stateless* applications are dependent on the server-side state.

- a. True
- b. False

3. When cache contents are set with a `private` directive, it means that the contents cannot be stored in browser’s cache.

- a. True
- b. False

4. HTTP is a stateless protocol.

- a. True
- b. False

5. In quorum consensus, strong consistency arises when the read sets do not overlap with the write sets.

- a. True
- b. False

## SECTION B Multiple choice questions (20 marks)

**Instructions:** There are 10 questions in this section. Each question is worth 2 marks.

6. To build web servers using the `http` module included in `Node.js` platform which function do we use?

- a. `get()`
- b. `require()`
- c. `createServer()`
- d. None of the above

7. Which of the following represents a record in NoSQL?

- a. Field
- b. Document
- c. Collection
- d. Database

8. Which of the following is not an advantage of a NoSQL over RDBMS?

- a. Flexibility
- b. Better scalability
- c. Easy replication
- d. Improved ability to keep data consistent

9. What will be the output of the following EJS code?

```
{  
  "name": "<strong>Smith</strong>"  
}  
<p>Welcome, <%=name %>.</p>
```

- a. Smith
- b. `<strong>Smith</strong>`
- c. **Smith**
- d. Run time error

10. Which of the following constraints is optional in REST architecture?

- a. Layered system
- b. Uniform interface
- c. Stateless architecture
- d. Code on demand

11. Which one of the following security risks arise when restrictions on what authenticated users are allowed to do are not properly enforced?

- a. Broken access control
- b. Cryptographic failure
- c. SQL injection
- d. Session hijacking

12. Select **ALL** valid statements.

- i. In causal consistency causally related writes must be seen by all devices in the same order.
  - ii. Asynchronous leader-follower replication models compromise availability in favour of consistency.
  - iii. A semi-synchronous leader-follower replication model avoids the issue of writes being lost when a leader fails.
  - iv. An overlap between read and write sets in a Quorum consensus based replication model allows reads to be consistent with the updated writes in the write set.
- a. ii Only
  - b. i Only

- c. i, ii and iii Only
- d. i, iii and iv Only

13. Consider an application that involves more writes than reads. In such a scenario, which of the following will be a suitable configuration for Quorum consensus replication such that there is a good balance between availability and consistency?

- a.  $N = 3, R = 3, W = 1$
- b.  $N = 3, R = 2, W = 2$
- c.  $N = 3, R = 1, W = 1$
- d.  $N = 3, R = 1, W = 3$

14. Which of the following response headers will tell the client that the response is to be cached for 1 minute?

- a. `expires:1 minute`
- b. `cache-control:max-age=60`
- c. `expires:1 January 2020`
- d. `cache-expires:max-age=60`

15. Which of the following is not an example of XSS attack?

- a. Stored XSS
- b. DNS XSS
- c. Reflected XSS
- d. Dom-based XSS

**SECTION C Short Answer Questions (20 marks)**

**Instructions: Attempt any four (4) of the five (5) questions in this section. Each question is worth 5 marks.**

16. What is a token-based authentication. Explain its use in the design of stateless applications. **(5 marks)**

17. What is Cross Site Request Forgery? Explain by giving a suitable example. **(5 marks)**

18. Explain the difference between cache-aside and write-through caching strategy. List one advantage of write-through caching strategy over cache-aside strategy. (5 marks)



19. Explain the use of Last-Modified and ETags as cache control headers. **(5 marks)**

20. List two differences between caching and replication.

**(5 marks)**

## **SPARE PAGE FOR EXTRA ANSWERS**

Cross out rough working that you do not want marked.  
Specify the question number for work that you do want marked.

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