NWEN 304 : Mid-term Test II

13 October 2023

Instructions

- Time allowed: **50 minutes**

- Attempt **all** the questions. There are 50 marks in total.

- **In-person**: Write your answers in this test paper and hand in all sheets.
  Remote: Type your answers in the template file and submit to **Remote-Test-II** on the NWEN 304 submission system.

- If you think a question is unclear, ask for clarification.

- This test contributes 25% of your final grade.

- You may use dictionaries and calculators.

- You may write notes and working on this paper, but make sure your answers are clear.

Sections		Marks	
1.	True/False	[10]	
2.	Multiple Choice	[10]	
3.	Multiple, Multiple Choice	[10]	
4.	Short Answer	[20]	
		TOTAL:	

Question 1. State True or False. Write your answer in the box provided.   **[10 marks]**

(a) **[1 mark]** Response order is not maintained in HTTP/2.

┌─────────────────┐
│   │
│   │
└─────────────────┘

(b) **[1 mark]** Requests in `stateful` session management are self-contained i.e everything required by the server to service the request is contained within the request.

┌─────────────────┐
│   │
│   │
└─────────────────┘

(c) **[1 mark]** A templating engine enables use of static template files to render static web pages.

┌─────────────────┐
│   │
│   │
└─────────────────┘

(d) **[1 mark]** The reason why `Key-value` stores do not allow to filter or control what's returned with a request based on the value is because they store values as `BLOBs`.

┌─────────────────┐
│   │
│   │
└─────────────────┘

(e) **[1 mark]** HTTP is a `stateless` protocol.

┌─────────────────┐
│   │
│   │
└─────────────────┘

(f) **[1 mark]** The use of placeholders in `SQL` queries helps in preventing `CSRF` attacks.

┌─────────────────┐
│   │
│   │
└─────────────────┘

(g) **[1 mark]** Proxy cache is a public cache shared among multiple clients.

┌─────────────────┐
│   │
│   │
└─────────────────┘

(h) **[1 mark]** Token based authetication does not suppport server-driven logout.

┌─────────────────┐
│   │
│   │
└─────────────────┘

(i) **[1 mark]** `Reflected XSS` attacks infect a specific user as against `Stored XSS` attack that infects all the users of the application.

(j) **[1 mark]** Synchronous leader-follower replication design of a `RDBMS` may result in weak consistency.

**Question 2. Multiple choice questions. Each question has a single correct option. [10]
Write your answer in the box provided.**

(a) **[1 mark]** What will be the output of the following EJS code:

```
{
    "name":"<strong>Bob</strong>"
}
 <p><%-name %></p>
```

  (i) Bob
 (ii) Bob
(iii) **Bob**
(iv) Run time error

```
┌─────────────────┐
│                 │
│                 │
│                 │
└─────────────────┘
```

(b) **[1 mark]** On requesting a page user receives a 404 error. Who is at fault?

  (i) Client
 (ii) Server
(iii) None
(iv) Both

```
┌─────────────────┐
│                 │
│                 │
│                 │
└─────────────────┘
```

(c) **[1 mark]** Which one of the following versions of HTTP protocol is based on UDP?

  (i) HTTP/.9
 (ii) HTTP/1
(iii) HTTP/2
(iv) HTTP/3

```
┌─────────────────┐
│                 │
│                 │
│                 │
└─────────────────┘
```

(d) **[1 mark]** Which one of the following REST constraints is optional?

  (i) The server does not maintain state of any client.
 (ii) A uniform interface is maintained between the client and the server using HTTP methods and media types.
(iii) Clients can evolve independently as long as there are no breaking changes in the interface.
(iv) Server can extend client functionality based on choices made by the user.

```
┌─────────────────┐
│                 │
│                 │
│                 │
└─────────────────┘
```

(e) **[1 mark]** Which of the following methods is used to update a record in the database?

(i) PUSH

(ii) GET

(iii) PUT

(iv) POST

(f) Which of the following response headers will tell the client that the response is to be cached for 1 minute?

(i) expires:1 minute

(ii) cache-control:max-age=60

(iii) expires:1 January 2020
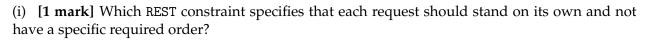
(iv) cache-expires:max-age=60

(g) **[1 mark]** Which of the following types of server-side caching strategy is ideal for caching results of database queries in a distributed system?

(i) Database integrated cache

(ii) Local cache

(iii) Remote cache

(iv) No cache

(h) **[1 mark]** Use of `same-site` cookie helps address which of the following security risks.

(i) CSRF

(ii) SQL injection

(iii) Session hijacking

(iv) Broken authentication

(i) **[1 mark]** Which REST constraint specifies that each request should stand on its own and not have a specific required order?

(i) Uniform interface

(ii) Cacheable

(iii) Stateless

(iv) Client-server

(j) **[1 mark]** Which of the following helps reduce network latency involved in Web applications?

(i) Use of `non-persistent` connections

(ii) Data caching

(iii) Both (i) and (ii) above

(iv) None of the above

**Question 3. Multiple, multichoice questions. Each question has multiple correct options.[10]
Write your answer in the box provided.**

(a) **[2 marks]** Which of the following resources are <u>always</u> render blocking?

(i) HTML
(ii) CSS
(iii) Image
(iv) JavaScript

```
┌─────────────────┐
│                 │
│                 │
│                 │
└─────────────────┘
```

(b) **[2 marks]** Which of the following statements are <u>true</u> for Synchronous leader-follower replication design?

(i) Increases latency for writes (slows down writes)
(ii) Reduces write availability
(iii) Increases write availability
(iv) Reduces latency for writes

```
┌─────────────────┐
│                 │
│                 │
│                 │
└─────────────────┘
```

(c) **[2 marks]** Which of the following statements are <u>true</u> for Non-relational databases?

(i) Supports high security
(ii) Provides high scalability
(iii) Provides support for arbitrary queries
(iv) Provides support for storing arbitrary sets of values in a record

```
┌─────────────────┐
│                 │
│                 │
│                 │
└─────────────────┘
```

(d) **[2 marks]** Which of the following statements are <u>true</u> for caching?

(i) Caching helps reduce network bandwith.
(ii) `no-cache` cache-control header directs the browser to not cache a response.
(iii) `max-age` cache-control directive allows the browser to make conditional requests.
(iv) The `Write-behind` caching strategy does not wait for the acknowledgment on whether the data has been stored in the database.

```
┌─────────────────┐
│                 │
│                 │
│                 │
└─────────────────┘
```

(e) **[2 marks]** Which of the following statements are <u>true</u> for REST architecture?

(i) REST is based on a message-based API design style.
(ii) A client can ordinarily tell whether it is connected directly to the end-server.
(iii) REST assumes a disconnected system.
(iv) The knowledge and understanding obtained from one component of an API should be generally applicable elsewhere in the API.

```
┌─────────────────┐
│                 │
│                 │
│                 │
└─────────────────┘
```

Question 4. Short answer questions [20 marks]

(a) **[4 marks]** What is the difference between `Persistent` and `Non-persistent` HTTP connections?

(b) **[4 marks]** Explain the `cache-aside` and the `read/write through` caching strategy.

(c) **[6 marks]** What is a critcal rendering path? List 3 ways you would try to optimize critical rendering path.

(d) **[6 marks]** Explain any three REST constraints.

* * * * * * * * * * * * * * *

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.