



EXAMINATIONS – 2021

TRIMESTER 2

NWEN 304

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 examination.
No electronic dictionaries are allowed.

Instructions: Attempt ALL TWENTY ONE (21) questions:

There are THREE (3) sections:

- Section A - True or False [10 marks]
- Section B - Multiple Choice [20 marks]
- Section C - short Answers [30 marks]

The examination consists of 60 marks in total.

SECTION A True or False [10 marks (2 marks each)]

1. State True or False. Middleware services are application dependent.

- a. True
- b. False

2. State True or False. Moving a website from one data centre to the other is an example of location transparency.

- a. True
- b. False

3. State True or False. Response order is not maintained in HTTP/2.

- a. True
- b. False

4. Consider the following code segment.

```
function callBackFn(num, callback)
{
    callback(num);
}
function callback(num)
{
    console.log(num);
}
callBackFn(5, callback)
```

State True or False. The function call to the callback function `callback(num)` is a synchronous callback.

- a. True
- b. False

5. Consider the following code segment.

```
let http=require('http');
let s = http.createServer(function(req,res){

    res.writeHead(200,{'content-type':'text/plain'});
    res.write('Hello\n');

    setTimeout(()=>{res.end("world\n")},2000);
});
s.listen(3000);
```

State True or False. During the execution of the code segment the main thread process sleeps while the function `setTimeout` executes.

- a. True
- b. False

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

SECTION B Multiple Choice [20 marks (2 marks each)]

6. Which of the following tasks are preferred to be done asynchronously, if possible?

- a. I / O
- b. Downloading a remote file
- c. API call
- d. All the above

7. Ability of a client to access a resource from different locations is an example of which of the following distribution transparency :

- a. Location transparency
- b. Relocation transparency
- c. Migration transparency
- d. All the above

8. On requesting a web page the user receives a 404 error. Who is at fault?

- a. Client
- b. Server
- c. Neither
- d. Both

9. Which one of the following REST constraints is optional?

- a. Server does not maintain state of any client.
- b. A uniform interface is maintained between client and server using HTTP methods and media types
- c. Clients can evolve independently as long as there are no breaking changes in the interface
- d. Server can extend client functionality based on choices made by a user

10. Fill in the blank. Fetch API is exposed by _____

- a. Browser
- b. Operating System
- c. HTTP protocol
- d. None of the above

11. Which of the following versions of HTTP protocol is built on User Datagram Protocol (UDP)?

- a. HTTP/1.1
- b. HTTP/2
- c. HTTP/3
- d. None of the above

12. A RESTful service uses which of the following methods to update a Database:

- a. POST
- b. PUT
- c. PUSH
- d. GET

13. Select all (possibly more than one) valid statements.

- a. In MVC architecture controller is the glue between the model and the view
- b. Express is a client side MVC framework
- c. Replication is an important scaling approach, however, it leads to consistency problems
- d. DOM treats an HTML Document as an array of elements

14. What will be the output of the following code segment:

```
let obj = {a:10,  
           b:20,  
           disp:()=>{console.log(this.a+" "+this.b)}}  
obj.disp();
```

- a. 10 20
- b. undefined undefined
- c. Run time error
- d. None of the above

15. What is the role of a rendering engine in a browser?

- Parse HTML document to construct a DOM tree
- Parse CSS files to create a CSSOM tree
- Combine DOM and CSSOM trees to form a Render tree
- All of the above

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SECTION C Short Answers [30]

16. Explain the difference between a web-service and a website? **(4 marks)**

17. List two advantages of a Resource based API over a RPC based API, giving suitable examples. **(4 marks)**

18. What is Head of line blocking in HTTP? Explain how HTTP/2 solves this problem. **(6 marks)**

19. What will the JavaScript code below output to the console? Explain your answer. **(4 marks)**

```
console.log((function f(n) return ((n > 1) ? n * f(n-1) : n))(6));
```

20. Briefly discuss the difference between === and == in JavaScript programs. Please provide an example for each operator. **(6 marks)**

21. You are given the following JavaScript code segment that is expected to return true if the two argument arrays are identical. **(6 marks)**

```
function checkArrEquals(arr1, arr2) {  
  if (arr1 === arr2)  
    return true  
  else  
    return false  
}
```

Given two arrays: a = [1, 2, 3] and b = [1, 2, 3], the output obtained on calling the function checkArrEquals(a,b), however, is false. Explain why the function does not give the desired results. Also, rewrite the function to correctly check if the two arrays are equal.

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