

# COMP 2406 Fall 2017 Midterm Test -ANSWERS

Scantron Test: Submit answers on the Scantron card provided, you can keep the test paper.  
Questions each worth 1 mark (20 marks total).

## INTERNET PROGRAMMING GENERAL

1) Which ONE of the following is FALSE about URL's, IP addresses and Ports?

- A) Accessing `http://localhost:3000` uses the TCP/IP stack.
- B) An IP address can serve more than one port number at a time.
- C) A port number need not always be supplied in a URL.
- D) An IP address represents a computer host on the internet.
- E) The URL `http://localhost:3000/login.html` refers specifically to a sever file named "login.html".

2) Which ONE of the following statements about the HTTP protocol is FALSE?

- A) HTTP can transport .html and .css files but not .js files.
- B) Both HTTP GET and POST can transport user data.
- C) HTTP can be used on ports other than 3000.
- D) HTTP is stateless (has no notion of previous messages).
- E) Only HTTP GET, not POST, can be cached by the browser.

3) Which ONE of the following is TRUE regarding the difference between a GET and POST HTTP request?

- A) GET can communicate user query parameters and values but POST cannot.
- B) POST requests are encrypted but GET requests are not.
- C) GET parameters are visible in the browser address bar but POST parameters are not.
- D) GET HTTP requests can be inspected by routers but POST requests cannot.
- E) POST query parameters are limited in length but GET parameters are not.

4) JSON is a popular format for transporting data between client and server. Which ONE of the following statements about JSON is TRUE?

- A) JSON is more verbose than its competitor XML.
- B) JSON data are objects but XML data are just strings.
- C) An NPM module must be installed and required to parse JSON data.
- D) JSON can only be transported with a MIME type 'application/json'.
- E) JSON data can be transported with an AJAX get or post request.

5) Which ONE of the following is FALSE about JSON encoding?

- A) JSON strings can use single or double quotes to describe property names.
- B) Not all javascript objects can be converted to JSON.
- C) JSON can describe data but not javascript functions.
- D) JSON can use string literals like "2015/10/17" to represent dates.
- E) JSON representations are not javascript objects.

**JAVASCRIPT**

6) Which ONE of the following best describes the difference between javascript's == and === operator?

- A) The == operator is used to compare primitives but the === is used to compare objects.
- B) == will return true or false only but === can return true, false, or null.
- C) === is only used for comparisons between strings.
- D) == will answer whether two string variables are identical (refer to the same string object) but === will answer whether their characters match.
- E) == allows the compiler to type-cast its arguments but === does not allow type casting.

7) Which ONE of the following is FALSE regarding the difference between variables declared with var, let, or const in Javascript? [Question 7 accidentally had two false answers to this question has been eliminated -the test will be marked out of 19]

- A) Variables declared with var are hoisted but those declared with let are not.
- B) Variables declared with const are hoisted but those declared with let are not.
- C) Variables declared with var have function scope but those declared with let have block scope.
- D) Variables declared with var can be assigned to (re-assigned) but those declared with let cannot.
- E) Variables declared without var, let, or const are legal and have global scope.

8) Which ONE of the following statements is NOT legal in Javascript?

- A) object = {case: 'value'};
- B) object = {'case': 'value'};
- C) object.box = 'value';
- D) object[case] = 'value';
- E) object['case'] = 'value';

9) Consider the following Javascript code:

```
function f(){
    for(var i=0; i<5; i++)    //line 1
        console.log("i: " + i);
}
f();
console.log("i: " + i);    //line 2
```

Which ONE statement below best describes the result of removing the keyword var in line 1 above. That is, changing var i=0; to just i=0;?

- A) Line 1 would not compile.
- B) Line 2 would no longer compile where previously it did.
- C) Line 2 would print 0.
- D) Line 2 would print 5.
- E) Line 2 would throw a runtime error.

10) Given the javascript function `function f(aName){this.name = aName;}`, which ONE of the following is TRUE about what `this` refers to?

- A) `this` only applies when the function is called like `x.f('Sue');` and then `this` refers to `x`.
- B) The function `f` can only be used as a constructor with `new` and `this` refers to the new object created.
- C) The function `f` can only be used (invoked) as a method of some object.
- D) The function definition will not compile if function `f` is not declared within a javascript object.
- E) `this` refers to the global object when the function is executed as follows `f('Sue');`

11) Suppose `x` is a javascript object that does not have a property `name` defined. Which ONE of the following best describes what happens if you execute the expression `x.name = 'Lou';` in Javascript?

- A) The code does not compile.
- B) The code throws a run-time exception.
- C) The assignment is ignored and nothing about `x` is changed.
- D) The property `name` is added to the global object and assigned the value `'Lou'`.
- E) The member `name` is added to the object and assigned the value `'Lou'`.

12) Consider the following javascript code:

```
var a = [];  
a[0] = 12;  
a[5] = "Lou";  
a["Sue"] = "Smith";  
console.log("a: ", a);  
console.log("length: ", a.length);
```

Which ONE of the following is TRUE about the code above?

- A) The code will not compile because `var a = [];` is not legal.
- B) The code will not compile because `a["Sue"] = "Smith";` is not legal.
- C) The code compiles and runs and the last line outputs: `length: 3`.
- D) The code compiles and runs and the last line outputs: `length: 5`.
- E) The code compiles and runs and the last line outputs: `length: 6`.

13) Which ONE of the following best explains what the `f.prototype` property of a function object `f` refers to in javascript?

- A) It is the inheritance prototype of object `f`.
- B) It is the inheritance prototype of an object created as `new f()`.
- C) It is the same object as the one obtained from the expression `f.__proto__`.
- D) It is not defined when `f` is used as a constructor with `new`.
- E) It is undefined because `.prototype` only applies to non-function objects.

14) Which of the following best describes the implication of closures in javascript?

- A) Closures make use of the traditional procedure stack without requiring modification of the stack.
- B) Closures prevent access to local variables of functions that have returned from their execution.
- C) Closures enable local variables of a function to be accessed after the function execution has returned.
- D) Closures mean that variables defined outside a function are not visible to that function.
- E) Closures allow two separate functions to see each other's local variables.

15) Consider the following javascript module meant to implement a simple set data structure:

```
function Set() {
    var collection = [];
    this.add = add;
    this.remove = remove;
    this.contains = contains;
    this.toString = function() {return collection.toString()};
}
function add(x) { //add element x is no current element === x
    if(collection.indexOf(x) < 0) collection.push(x);
}
function remove(x) { //remove first occurrence of element === x
    var position = collection.indexOf(x);
    if(position > -1) collection.splice(position, 1);
}
function contains(x) { //answer whether set contains element === x
    return this.collection.indexOf(x) > -1;
}
module.exports = Set;
```

Which ONE of the following best explains why this code will not work?

- A) Set should be a class and not a function.
- B) var collection is not in the scope of function add().
- C) var collection is not in the closure of function Set().
- D) The Set function cannot be invoked using new.
- E) The code will not work because the module.exports = Set overrides the default exports object.

16) Consider the following javascript code:

```
var counter = 100; //line 1
function make() {
    var local = 10;
    return function(x) {return x + local + counter;} //line 2
}
var action = make(); //line 3
console.log(action(8)); //line 4
```

Which ONE of the following statements about the above code is TRUE?

- A) line 2 will not compile because the function being returned has no name.
- B) line 3 is not legal because a function cannot be returned as an object.
- C) line 4 is not legal because the object returned by make cannot be invoked as a function.
- D) line 4 is not legal because action has no access to the local variable of make().
- E) line 4 is legal and will print 118 to the console.

**NODE JS**

17) Consider the following code that implements a Node.js server.

```
var http = require('http'); //needed for http messaging
var fs = require('fs'); //needed to read and write files
var url = require('url'); //useful to parse URLs
var ROOT_DIR = 'html'; //directory for serving files from

http.createServer(function (request,response){
  var urlObj = url.parse(request.url, true, false);
  console.log("PATHNAME: " + urlObj.pathname);
  console.log("REQUEST: " + ROOT_DIR + urlObj.pathname);

  fs.readFile(ROOT_DIR + urlObj.pathname, function(err,data){
    if(err){
      console.log('ERROR: ' + JSON.stringify(err));
      response.writeHead(404);
      response.end(JSON.stringify(err));
      return;
    }
    response.writeHead(200, {'Content-Type': 'text/html'});
    response.end(data);
  });
}).listen(3000);
```

Which ONE of the following statements about this code is TRUE?

- A) The application serves dynamic web pages, not static files.
- B) The file reading is synchronous.
- C) The function (request, response) is invoked when createServer (...) is called in the code.
- D) Images cannot be served by this server.
- E) **CSS style sheets cannot be served by this server.**

18) Which ONE of the following statements about package.json files is TRUE?

- A) They are dangerous because they always refer to the latest version of an NPM module.
- B) They are always needed to run a node.js application that depends on an NPM module.
- C) They only apply to client-server applications that exchange JSON data.
- D) **They provide a way to load a specific versions of an NPM module.**
- E) They are the mechanism used to help ensure that only the latest version of an NPM module is loaded.

**19)** Consider the following code intended to implement a Node.js based static server that could serve files similar to those found on our course web site.

```
var http = require('http');
var fs = require('fs');
var url = require('url');
var ROOT_DIR = 'public'; //directory for static files

http.createServer(function (request,response){

    var urlObj = url.parse(request.url, true, false);

    fs.readFile(ROOT_DIR + urlObj.pathname, function(err,data){
        if(err){
            console.log('ERROR: ' + JSON.stringify(err));
            response.writeHead(404);
            response.end(JSON.stringify(err));
            return;
        }
        response.writeHead(200, {'Content-Type': 'text/html'});
        response.end(data);
    });
}).listen(3000);
```

Which ONE of the following best explains why it would not work as intended?

- A) It should require('https') not require('http').
- B) The readFile() function is synchronous but should be asynchronous.
- C) The content type 'text/html' is used for all content.
- D) It is missing the code to process POST messages needed to server static files.
- E) The response code of 200 is incorrect and should be a 303 code.

**20)** Consider the following code meant to read a file as part of a Node.js application.

```
var fs = require('fs');
var inputFilePath = "songs/output.txt";
fs.readFile(inputFilePath, 'utf8', function(err, data){
    console.log('now running callback function');
    if(err) console.log('FILE RE-READ ERROR');
    var fileData = JSON.parse(data);
});
console.log(fileData.songs[0]);
```

Which ONE of the following statements is correct about why this code would not work?

- A) The code is missing the require('http'); statement.
- B) The file reading is synchronous and should be asynchronous.
- C) JSON.parse(data) will not work without a require('json'); statement.
- D) console.log(fileData.songs[0]); will be called before the file contents is read.
- E) function(err, data) will be called before the file contents is read.