
***** Advanced Arduino : Mid-term EXAM. 2017.10.18 (수)

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1. What is the incorrect introduction to Node.js?

A. Node.js is a a JavaScript runtime built on Chrome's V8 JavaScript engine.
B. Node.js uses an action-driven architeture.
C. Node.js uses a non-blocking I/O model across distributed devices.
D. Npm is Node.js' package ecosystem with open source libraries.

2. What is the name of a file that contains all information of a node project?

A. package.cfg B. node.cfg
C. package.json D. node.json

3. Where is the suitable keyword to make a local module that user defines in the below code? The name of local module is "aanninfo.js".

```
// aanninfo.js
module.___[3]____ = function (id, name, phone) {
        console.log('My Info');
        console.log('ID : ' + id);
        console.log('Name : ' + name);
        console.log('Phone : ' + phone);
}
```

A. exports B. export C. packages D. package

4. How can you use a local module "aanninfo.js"?

```
// myinfo.js
var myinfo = ____[4]____('./aanninfo');
myinfo('aa77', 'COMSI', '010-1234-5678');
```

A. import B. callback C. request D. require

5. The below code snippets simply runs HTTP server in node.js.

```
// http server (web server)
var http = require('http');
var port = 3000;

var server = http.createServer(function(request, response) {
   response.writeHeader(200, {
      "Content-Type": "text/plain"
   });
   response.write("Hello HTTP server from node.js!");
   response.end();
});

server.____[5]____(port);
console.log("Server Running on " + port +
            ".₩nLaunch http://localhost:" + port);
```

5. What function is used to connect a server to a port?

A. send B. require C. listen D. connect

6-7. The below code snippets runs TCP client in node.js.

```
// tcp client
var net = require('net');
var port = 3000;
var client = new net.____[6]____;

client.connect(port, "127.0.0.1");
client.____[7]____ ('data', function (data) {
      console.log('Data: ' + data);
      client.destroy();
});
```

6. What function do you use to make TCP client object?

A. client() B. socket()
C. Client() D. Socket()

7. When event can you set for a client to listen to data incoming from TCP server?

A. on B. get C. off D. use

8 Now, you make an express application "aannApp" using express-generator. Select a command that can not launch aannApp.

A. ^B on a file ./bin/www B. npm start
C. node ./bin/www D. node ./app.js

9-10. The below code snippets is ./routes/index.js with two routes in an express application, aannApp.

```
var express = require('express');
var router = express.Router();

/* GET home page by /. */
router.get('/', function(req, res, next) {
  res.____[9]____('index', { title: 'Express by AA77' });  // views/index.jade
});

/* GET my info page by "???". -> multi-routing */
router.get('____[10]____', function(req, res, next) {
  res.____[9]____('aanninfo', { title: 'Express App',
                                id: 'AA77',
                                name: 'COMSI, 컴시' });  // views/aanninfo.jade
});

module.exports = router;
```

9. When you connect to express host using a route, the express host will show a html page that was converted from a jade file for a given route?

What is the correct function to return a jade file matching with the route?

A. write B. send C. show D. render

10. What route do you set here to connect your information via http://localhost:3000/aa77 ?

A. aa77 B. aa77info C. /aa77 D. /aa77info

Problems to Arduino [11 ~ 20]

11. What is the incorrect introduction to Arduino?

A. Arduino is simple and inexpensive.
B. Arduino is based on open source.
C. Arduino programming is simple and clear.
D. Arduino supports only Linux platform.

12. Now, you have a resistor with four color bands;
Brown(갈), Black, Orange, Silver.

What is the resistance value of this resistor?

A. 330 Ω B. 1 kΩ C. 10 kΩ D. 20 kΩ

13. Which one is the correct conversion to the output of potentiometer at A0 to the integer unit of percent?

A. int pct = map(a0output, 0, 256, 0,100); // %
B. int pct = map(a0output, 0, 1023, 0,100); // %
C. int pct = map(a0output, 0, 256, 0,256); // %
D. int pct = map(a0output, 0, 1023, 0,256); // %

14. PWM (Pulse Width Modulation) ia a technique for getting analog results with digital means. By changing pwm_value in analogWrite(pin, pwm_value) function, we can control the voltage of an LED connected to pin-9.
Which one is the correct usage of analogWrite() to keep an LED 50 % bright by supplying 50 % duty cycle?

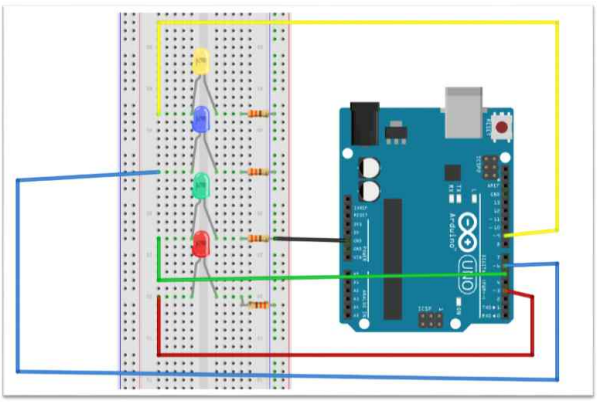
A. analogWrite(9, 0.5) B. analogWrite(9, 50)
C. analogWrite(9, 127) D. analogWrite(9, 255)

15-16. 다음은 4개의 단색 LED를 순서대로 디밍(dimming)시키는 아두이노 코드이다. 코드가 정상 동작하기 위해서 밑줄친 곳에 알맞은 내용은?

```
int ledR = 3;     // LED connected to digital pin 3
int ledG = 5;
int ledB = 6;
int ledY = ____[15]____; // 가능한 PWM pin number? -> 9, 10, 11

int dimTime = 20;

void setup()  {
  // nothing happens in setup
}
void loop()  {
  dimLed(ledR);  // fade ledR
  dimLed(ledG);  // fade ledG
  dimLed(ledB);  // fade ledB
  dimLed(ledY);  // fade ledY
}
void dimLed(int led) {
    // fade in from min to max in increments of 5 points:
  for(int fadeValue = 0 ; fadeValue <= 255; fadeValue +=5) {
    // sets the value (range from 0 to 255):
    analogWrite(____[16]____ led , fadeValue);
    // wait for 20 milliseconds to see the dimming effect
    delay(dimTime);
  }
  // fade out from max to min in increments of 5 points:
  for(int fadeValue = 255 ; fadeValue >= 0; fadeValue -=5) {
    analogWrite(____[16]____ led , fadeValue);
    // wait for 20 milliseconds to see the dimming effect
    delay(dimTime);
  }
}
```



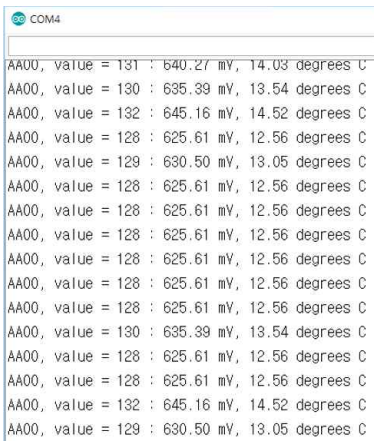
17-18. The below code snippets is an arduino project, TMP36.ino. TMP36 project monitors change in temperature.

```
int TEMP_INPUT = 0;
void setup() {
  Serial.begin(9600);
}
void loop() {
   //getting the voltage reading from the temperature sensor
  int value = ____[17]____(TEMP_INPUT);
  Serial.print("JV00, value = ");
  Serial.print(value);
  Serial.print(" : ");
   // converting that reading to voltage
   float voltage = value * 5.0 * 1000;  // in mV
   voltage /= ____[18]____1023.0;
   // print out the voltage
   Serial.print(voltage);
   Serial.print(" mV, ");
   // now print out the temperature
   float temperatureC = (voltage - 500) / 10 ;
   Serial.print(temperatureC);
   Serial.println(" degrees C");
   delay(1000);
}
```

Temp (° C) = (Vout − 500) / 10

Vout (mV) = value * (5000 / 1023)
(0 <= value <= 1023)

17. You can get the analog value from TMP36 sensor through analog input-0. What is the function to get the analog input from A0?



A. analogGet B. analogRead
C. analogSet D. analogWrite

18. What is the correct value here? (use the formula in a box)

A. 5.0 B. 100
C. 256 D. 1023.0

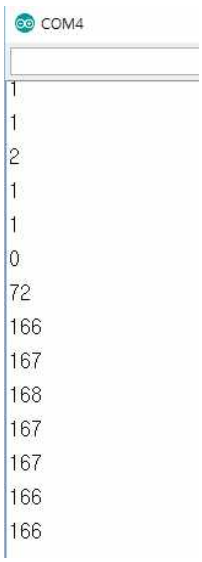
19-20. The below code snippets is an arduino project, CdS_lux.ino.
CdS_lux project monitors change in the luminosity of ambient light.

```
//  CdS_lux
#define CDS_INPUT 0
const int ledPin = 13;
int threshold = 70;

void setup() {
  pinMode(ledPin, OUTPUT);
  Serial.begin(9600);
}
void loop() {
  int value = analogRead(CDS_INPUT);
  int lux = ____[19]____int(luminosity(value));
  Serial.println(lux);
  // if lux is lower than a threshold, LED is set ON.
  if(lux >= threshold)
    digitalWrite(ledPin, ____[20.a]____LOW);
  else
    digitalWrite(ledPin, ____[20.b]____HIGH);

  delay(1000);
}
//Voltage to LuxLux
double luminosity (int RawADC0){
  double Vout=RawADC0*0.0048828125;  // 5/1024 (Vin = 5 V)
  int lux=(2500/Vout-500)/10;  // lux = 500 / Rldr, Vout = Ildr*Rldr = (5/(10 + Rldr))*Rldr
  return lux;
}
```

19. Write down the suitable code here to get the correct luminosity.
--- (int)



20. What is the correct values here?

A. HIGH, LOW B. HIGH, HIGH
C. LOW, LOW D. LOW, HIGH