به نام خدا

تمرین تئوری سیستم های نهفته

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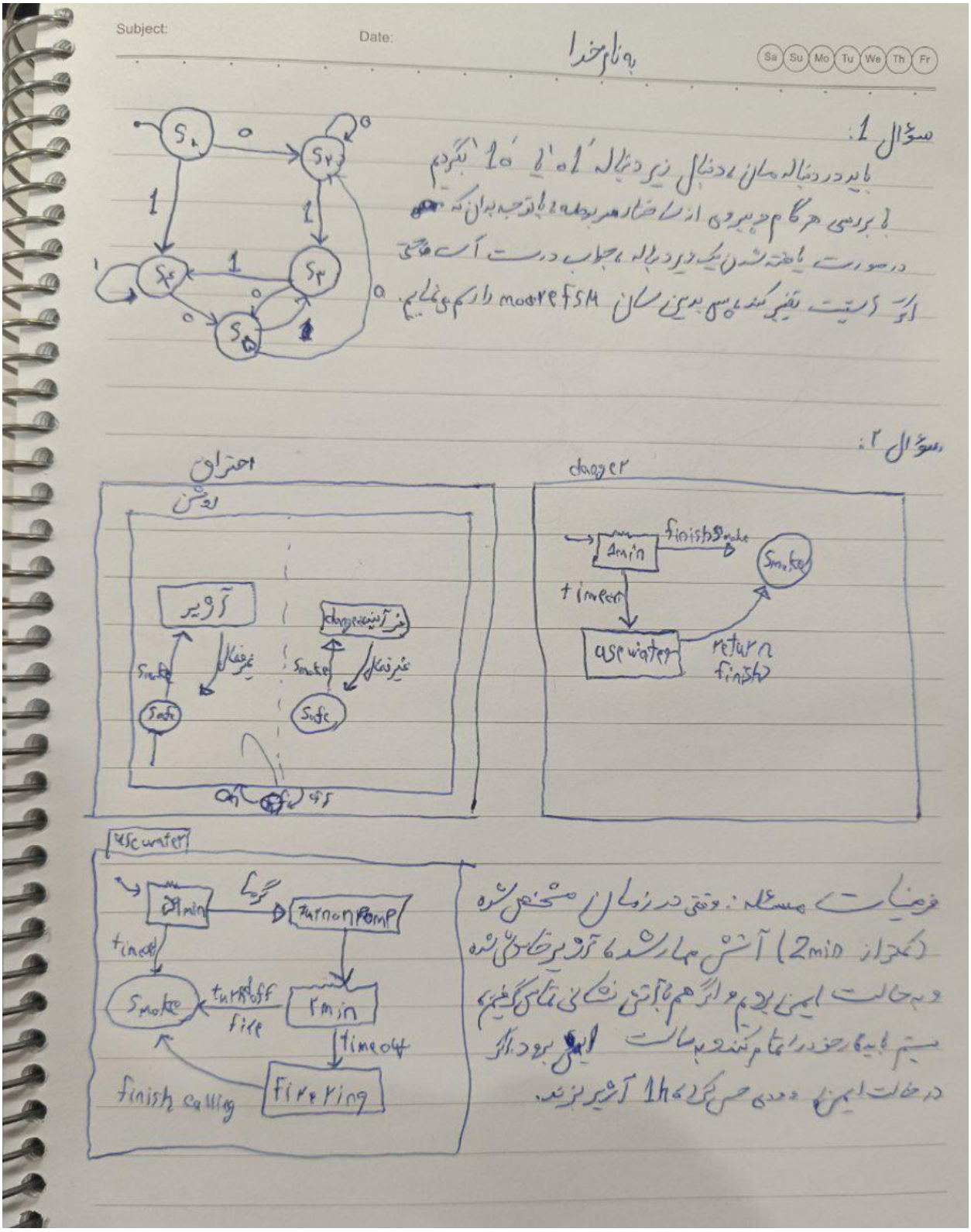
پاییز 1402

سوال 1و 2(در تصویر زیر)



سوال 3)

```
#include <Arduino.h>

const int redPin = 2;
const int yellowPin = 3;
const int greenPin = 4;
const int buttonPin = 7;

const int pinArray[][3] = {
  {redPin, LOW, 3000},
  {yellowPin, HIGH, 1000},
  {greenPin, HIGH, 3000}
};

enum TrafficLightState {
  RED,
  YELLOW,
```

```
  GREEN
};

TrafficLightState currentState = RED;
unsigned long previousMillis = 0;

void setup() {
  pinMode(redPin, OUTPUT);
  pinMode(yellowPin, OUTPUT);
  pinMode(greenPin, OUTPUT);
  pinMode(buttonPin, INPUT);

  digitalWrite(redPin, LOW);
  digitalWrite(yellowPin, LOW);
  digitalWrite(greenPin, LOW);
}

void loop() {
  int buttonState = digitalRead(buttonPin);
```

```
  if (buttonState == HIGH) {
    unsigned long currentMillis = millis();

    // Check if the button was pressed and the state has changed
    if (currentMillis - previousMillis >= pinArray[currentState][2] && currentState != GREEN) {
      previousMillis = currentMillis;
      updateState();
    }
  } else {
    digitalWrite(redPin, LOW);
    digitalWrite(yellowPin, LOW);
    digitalWrite(greenPin, LOW);
  }
}

void updateState() {
```

```
        digitalWrite(pinArray[currentState][0], LOW);


        currentState =
static_cast<TrafficLightState>((currentState + 1) % 3);


        digitalWrite(pinArray[currentState][0],
pinArray[currentState][1]);
    }
```