You may bring one page of notes, front and back, and a calculator.

Questions will be in short-answer format with partial credit for partial answers.

Questions will require you to read HTML and JavaScript code, but not write code.

Topics:

- All midterm topics
- GPS coordinates: latitude/longitude, possible applications
- Canvas: pixel coordinates; fillRect, clearRect, beginPath, closePath, lineTo, arc, fill, stroke methods
- Canvas processing: getImageData, putImageData methods; format of pixels in imageData data array
- Video: play, pause methods; currentTime property
- Local storage: setItem, removeItem methods; accessing items

Sample questions:

1. [5] Describe how the latitude and longitude components of GPS coordinates relate to positions on Earth.

2. [5] Consider the following Javascript code:
   ```javascript
   var canvas = document.getElementById("myCanvas");
   var context = canvas.getContext("2d");
   context.fillRect(100, 100, 100, 100);
   
   Assuming that the canvas is 300x300 pixels, describe (and draw) what is drawn to the screen. Be specific.
   
   3. [5] Consider the following Javascript code:
      ```javascript
      var canvas = document.getElementById("myCanvas");
      var context = canvas.getContext("2d");
      context.beginPath();
      context.arc(250, 250, 50, 0, Math.PI, false);
      context.closePath();
      context.fill();
      
      Assuming that the canvas is 300x300 pixels, describe (and draw) what is drawn to the screen. Be specific.
      
   4. [5] Consider the following Javascript code:
      ```javascript
      var canvas = document.getElementById("myCanvas");
      var context = canvas.getContext("2d");
      var imageData = context.getImageData(0, 0, canvas.width, canvas.height);
      var numPixels = imageData.width*imageData.height;
      var numChannels = 4*numPixels;
      for (var i = 0; i < numChannels; i = i + 4) {
         imageData.data[i] = 0;
      }
   
   context.putImageData(imageData, 0, 0, canvas.width, canvas.height);
   
   Describe the effect that the above code would have on the canvas.