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.
   ```