1. **(10 points)** List two of the fundamental principles of professional conduct of the NSPE (Nat’l Soc. of Professional Engineers).

   “Engineers shall hold paramount the safety, health, and welfare of the public...”

   2. “Engineers shall perform services only in the areas of their competence.”

2. **(10 points)** List the requirements for professional licensing as an engineer in the state of Nevada.

   - Applicants must have passed EIT exam, graduated from 4-year engineering program, record of 10 years or more of active experience in engineering work
   - Pass PE exam

3. **(10 points)** List two sequences of multiple courses required in the first and second years at UNLV that are prerequisites for most engineering courses you will be taking during the junior and senior years of study of Mechanical and Aerospace engineers. Enter your answers in the space below.

   - MATH (calculus) 181 to 429
   - PHYS 180 and 182

4. **(10 points)** Define the terms (a) Taylorism

   (b) Total Quality Management

   (a) The use of time studies to make production processes more efficient

   A method to continuously improve production by avoiding defects at all stages of the assembly process. This method involves all participants from shop floor personnel to management.

5. **(10 points)** Consider the Kansas City disaster. As a rule, how should a professional engineer respond when a design change is requested?

   A PE must always follow the NSPE code of ethics. This means specifically:

   Investigate thoroughly the effect of any proposed change. Here you would want to recalculate the structural loads in the hanging rods.
6. **(10 points)** You are in charge of selecting highly insulated windows for a new building development. In order to meet building codes, you find that you must specify expensive triple pane windows. The builder wants to avoid the added expense and suggests that you fudge the numbers a little so that it appears he is meeting code with double-pane windows. How should you respond?

**Answer**

Code violations carry legal penalties and might result in criminal convictions.

You should decline the request.

---

7. **(10 points)** Consider the Challenger disaster:
(a) How could the Morton Thiokol engineers have improved the quality of their presentation?
(b) What was known about the O-ring problem before the disaster?

(a) Add a trend line to the graph

(b) Dangerous loss of O-ring sealing capacity seemed more severe at low temperatures

---

8. **(10 points)** When (year?) and where (which country?) was the first digital electronic computer built?

**Answer:** (a) When? (year)

(b) Where? (country?)

---

9. **(20 points)** How did the Wright Brothers approach the problem of (a) building a lightweight engine., (b) lift of the aircraft’s wings?

(a) Light weight Motor: No motor was available commercially. So the brothers developed their own.

(b) wing lift experiments did not agree with published data. So the brothers built a wind tunnel and conducted systematic tests