



57:022 Principles of Design II

Final Exam - Spring 1992

Solution to Part One



1. Write the **number** corresponding to the correct probability distribution in each blank below.

*Note that some distributions may apply in more than one case, while others not at all!*

- 5   a. the number of cars passing through an intersection during a 1-minute green light.
- 3   b. the number of left-handed students in a class of 20.
- 11  c. the strength of a 10-foot steel chain
- 7  d. the time until the arrival of the third car at an intersection during a red light
- 8  e. the total weight of a group of persons on an elevator, when loaded to its capacity of 18 persons
- 9  f. the weight of the heaviest person on an elevator, when loaded to its capacity of 18 persons
- 4  g. the time you must wait for a bus after arriving at the bus stop
- 11  h. the lifetime of an electronic device with several dozen components which might fail (each necessary for the device to function)
- 1  i. the result of tossing a single coin
- 3  j. number of defective items found when testing a batch of 12.
- 4  k. the distance between two flaws in a telephone cable.
- 2  l. the number of items produced in order to obtain 5 acceptable items, if each is tested before producing the next
- 9  m. the magnitude of the highest rate of flow into the Coralville Reservoir next year
- 8  n. the completion time of a project with random task durations

Probability distributions:

- |                                |                               |
|--------------------------------|-------------------------------|
| 1. Bernoulli                   | 2. Geometric                  |
| 3. Binomial                    | 4. Exponential                |
| 5. Poisson                     | 6. Pascal (negative binomial) |
| 7. Erlang (Gamma) with $k > 1$ | 8. Normal                     |
| 9. Gumbel                      | 10. Uniform                   |
| 11. Weibull                    | 12. Chi-square                |
| 13. Beta                       | 14. Triangular                |