

CE 103 Comprehensive Exam
 From Xu Liang

1. A 2-hr Unit Hydrograph (UH) for a watershed is given in Table 1 below.

Table 1.

Time (hr)	0	1	2	3	4	5	6	7
2-hr UH (cfs)	0	20	40	70	90	50	10	0

- (1) What is the size (i.e., area) of this watershed in ft^2 .
 (2) Derive a 3-hr UH for this watershed using the S-Curve method.
2. The 10 based logarithm of annual peak discharge (i.e., $\log_{10}Q$) records (in cfs) of 40 years from Alameda county flood channel watershed at Union City, CA can be fitted to a straight line on a *normal probability paper* as shown in Figure 1 below. The horizontal axis represents non-exceedance probability (i.e., F). In the following, please use the fitted line to answer all the questions.

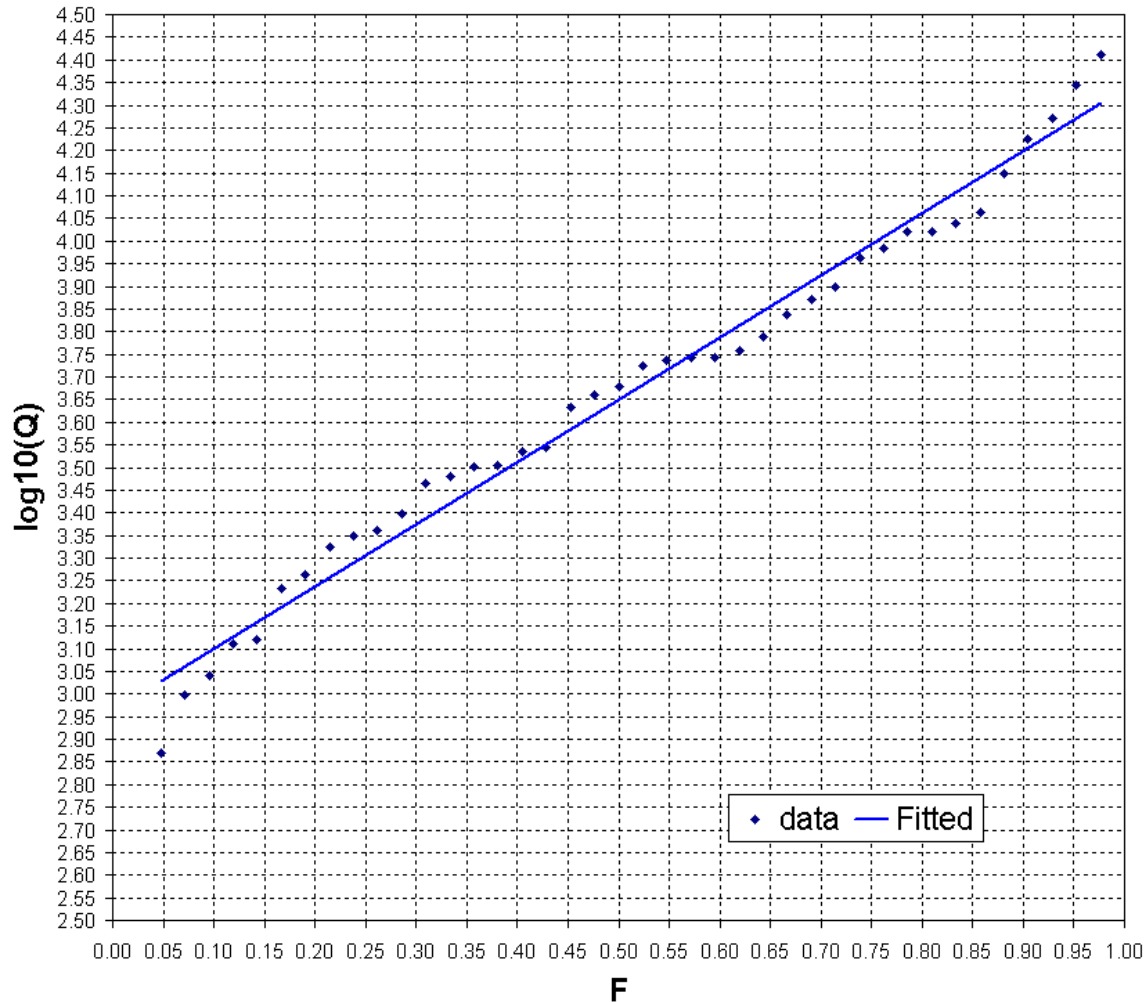


Figure 1

- (1) Which distribution below would be a good candidate for the annual peak discharge data shown in Figure 1?
(a). Normal (b) Log-Normal (c) Poisson (d) Binomial (e) Exponential
- (2) What is the probability that a flow will be less than or equal to $Q = 10,000$ cfs?
- (3) What is the magnitude of flood (Q) with a return period of 10 years?
- (4) What is the probability that at least one 100-year flood will occur in the next 20 years?