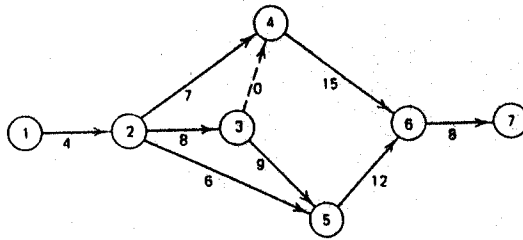


Question 2 (30%)

A project consists of seven activities. The precedence relationships of the seven activities are shown below in the activities-on-arcs representation, where the number associates with each arc is the time duration of that activity. Determine and mark the critical path.



Question 3 (30%)

Five jobs must pass through two machines in the same technological order. That is, they are processed on Machine 1 before they can be processed by Machine 2. The following table contains the processing times for those five jobs on each of two machines.

Job	Machine 1	Machine 2
1	4	3
2	1	2
3	5	4
4	2	3
5	5	6

Determine a minimum makespan job sequence.

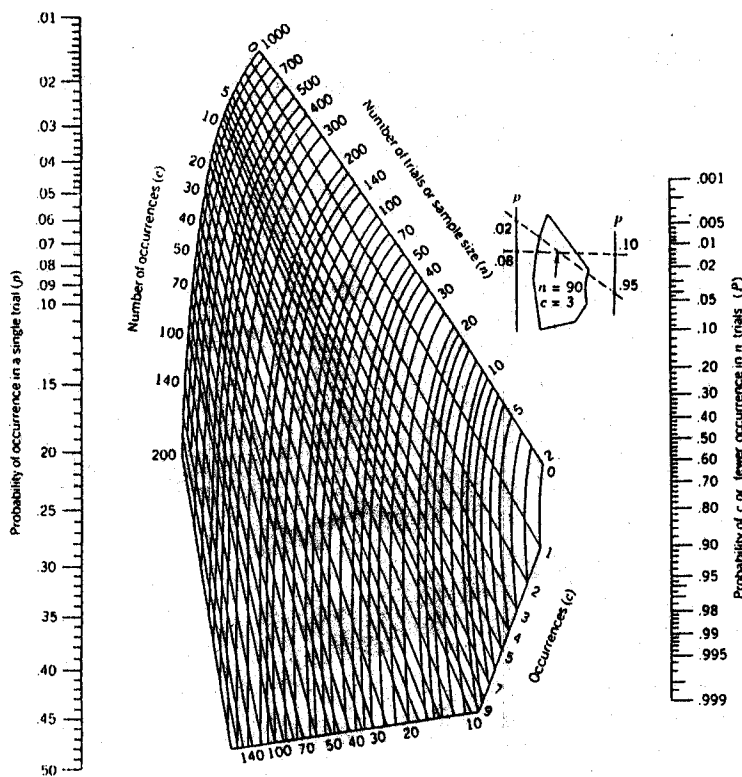
Question 1 (40%)

Acceptance sampling is a major field of statistical quality control. A single-sampling plan, defined by the sample size n and the acceptance number c , takes a random sample of size n and accept the lot if the number of observed defectives is less than or equal to c . A lot is submitted for inspection. Let p denote the fraction of defective units in the lot. In addition, it is desirable to have $\alpha = 0.05$ at $p = 0.03$ and $\beta = 0.10$ at $p = 0.15$, where α denotes the producer's risk (or the probability of type I error) and β is the consumer's risk (or the probability of type II error). Answer the following questions:

- 1. (10%) Let d denote the number of observed defectives. Are the following definitions about α and β correct?

$$\alpha = P(d \leq c | p = 0.03), \beta = P(d > c | p = 0.15).$$

- 2. (30%) Use the following nomograph to determine the single-sampling plan which achieves $\alpha = 0.05$ at $p = 0.03$ and $\beta = 0.10$ at $p = 0.15$ as specified above.



(背面仍有題目,請繼續作答)