c) Find the number of event standard deviations that the scheduled date is away from the expected duration.

$$\text{i.e.} \quad \frac{19 - 17.5}{1.65} = 0.91$$

d) Look up this value (0.91) in a table of areas under the Normal Curve to find the probability (Table I). In this case the probability of achieving the scheduled date of week 19 is **82%**.

Probability interpretation. If management consider that the probability of 82% is not high enough, efforts must be made to reduce the times or the spread of time of activities on the critical path. It is an inefficient use of resources to try to make the probability of reaching the scheduled date 100% or very close to 100%. In this case management may well accept the 18% chance of not achieving the schedule date as realistic.

Notes:

a) The methods of calculating the Expected Duration and Standard Deviation as shown above cannot be taken as strictly mathematically valid but are probably accurate enough for most purposes. It is considered by some experts that the standard deviation, as calculated above, underestimates the 'true' standard deviation.

b) When activity times have variations the critical path will often change as the variations occur. It is necessary therefore to examine critical and near critical activity paths when tackling an examination question involving variable activity times.

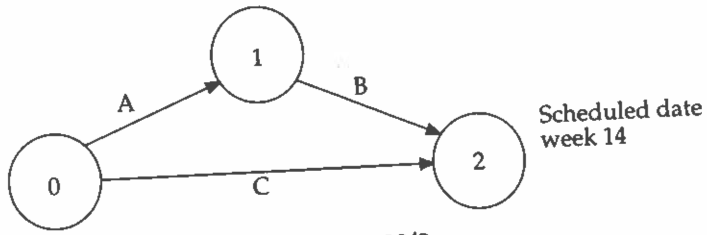
Discrete probabilities

9 Instead of the continuous probabilities, which were derived and used in the example in Para 7 above, on occasions probabilities are sometimes expressed in discrete terms. For example the time estimates for an activity could be given as follows:

	Estimates	
Activity	Time	Probability
A	8 weeks	0.6
	11 weeks	0.4

The expected time for activity A would be $(8 \times 0.6) + (11 \times 0.4) =$ **9.2 weeks**.

Discrete probability example. Assume that time estimates have been made for the following network using discrete probabilities thus:



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