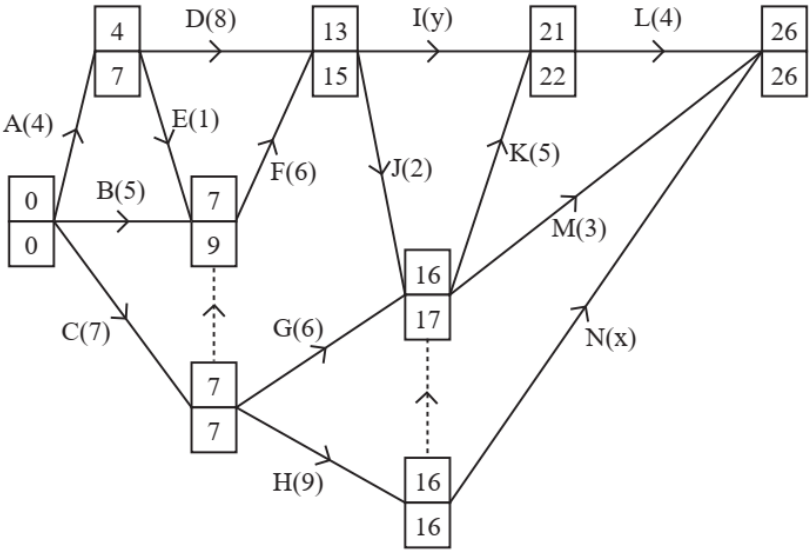
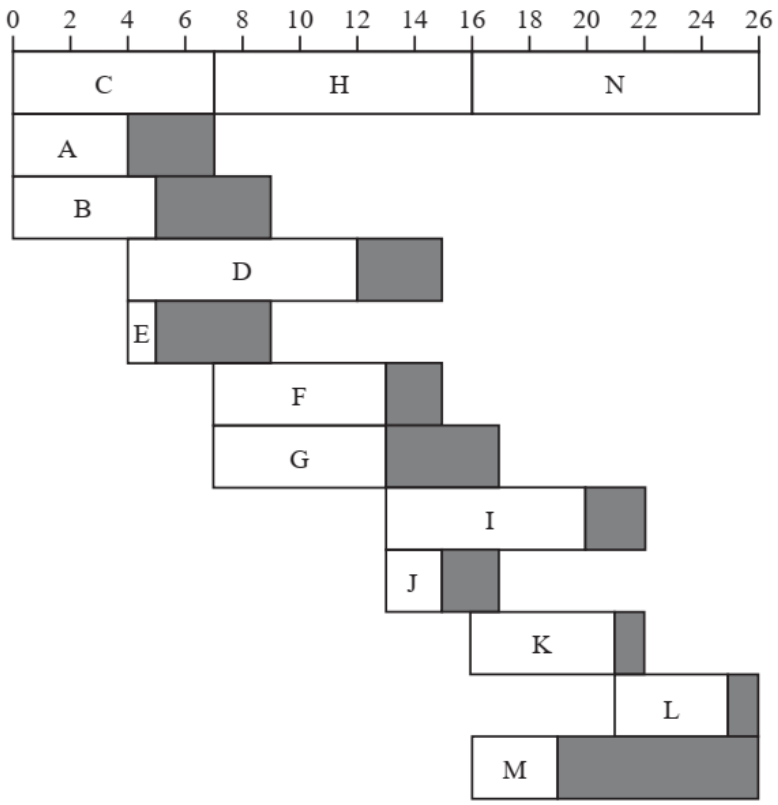
| | | |
|---|---|---|
| **2.(a)** | $x = 10$<br>$y = 7$ from $9 - 0 - 5 = 2(22 - 13 - y)$ (oe) | B1<br>B1 **(2)** |
| **(b)** |  | M1<br>M1<br>A1 **(3)** |
| **(c)** | <br>Lower bound is 4 workers e.g. activities H, D, F and G together with $11 < \text{time} < 12$ | M1<br>A1<br>A1<br>A1<br>depM1 A1 **(6)** |
| | | **11 marks** |
| **Notes for Question 2** | | |

**a1B1:** cao for $x$ (ignore working for this mark)
**a2B1:** cao with sufficient working as Answer Given – as a minimum accept $4 = 2(9 - y)$ (oe) but just $4 = 18 - 2y$ is B0

**b1M1:** All top boxes complete, values generally increasing in the direction of the arrows (so generally going from 'left to right' across the network), condone one 'rogue' value (if values do not increase in the direction of the arrows then if one value is ignored and the remaining values do increase in the direction of the arrows then this is considered to be a single rogue value). Note that all values in the top boxes could be incorrect but it can still score the M mark if the values are **increasing** in the way stated above
**b2M1:** All bottom boxes complete. Values generally decreasing in the opposite direction of the arrows (so generally going from 'right to left' across the network), condone one 'rogue' (as described above in **b1M1**)
**b1A1:** cao – **all** values correct

**c1M1:** At least ten different activities labelled including at least seven floats. A scheduling diagram (so a diagram in which no floats are evident) scores M0
**c1A1:** The critical activities dealt with correctly and appearing just once (C, H and N) and three non-critical activities dealt with correctly (both duration and total float correct)
**c2A1:** Any six non-critical activities correct (this mark is not dependent on the previous A mark)
**c3A1:** cso – completely correct Gantt chart (exactly fourteen activities appearing just once)
**c2dM1:** Dependent on first M mark in this part. Either a statement with the correct number of workers (4) and stating the correct activities (H, D, F and G) with any numerical time stated **or** the correct number of workers (4) and a time in the interval $11 \leq t \leq 12$ – mark the numerical value only not their use of the words 'day/time' (or equivalent)
**c4A1:** A completely correct statement with details of both time **and** activities. Candidates must give a time within the correct interval of $11 < t < 12$, e.g. 11.5 (or 'on/during day 12') and state the correct activities (H, D, F and G).
Please note the strict inequalities for the time interval (e.g. implying a time of 11 is incorrect). Answers given as an interval of time are acceptable provided the time interval stated is correct for all its possible values (e.g. time 11 – 12 or 'between 11 and 12' is A0). A completely correct statement with an additional incorrect statement scores A0 (so do not ignore subsequent working)

For (c) the following may be useful in checking their cascade chart provided the float is shown after the corresponding activity:

| Activity | Duration + Float |
|---|---|
| A | 0 to 4<br>F: 4 to 7 |
| B | 0 to 5<br>F: 5 to 9 |
| C | 0 to 7<br>Critical |
| D | 4 to 12<br>F: 12 to 15 |
| E | 4 to 5<br>F: 5 to 9 |

| Activity | Duration + Float |
|---|---|
| F | 7 to 13<br>F: 13 to 15 |
| G | 7 to 13<br>F: 13 to 17 |
| H | 7 to 16<br>Critical |
| I | 13 to 20<br>F: 20 to 22 |
| J | 13 to 15<br>F: 15 to 17 |

| Activity | Duration + Float |
|---|---|
| K | 16 to 21<br>F: 21 to 22 |
| L | 21 to 25<br>F: 25 to 26 |
| M | 16 to 19<br>F: 19 to 26 |
| N | 16 to 26<br>Critical |