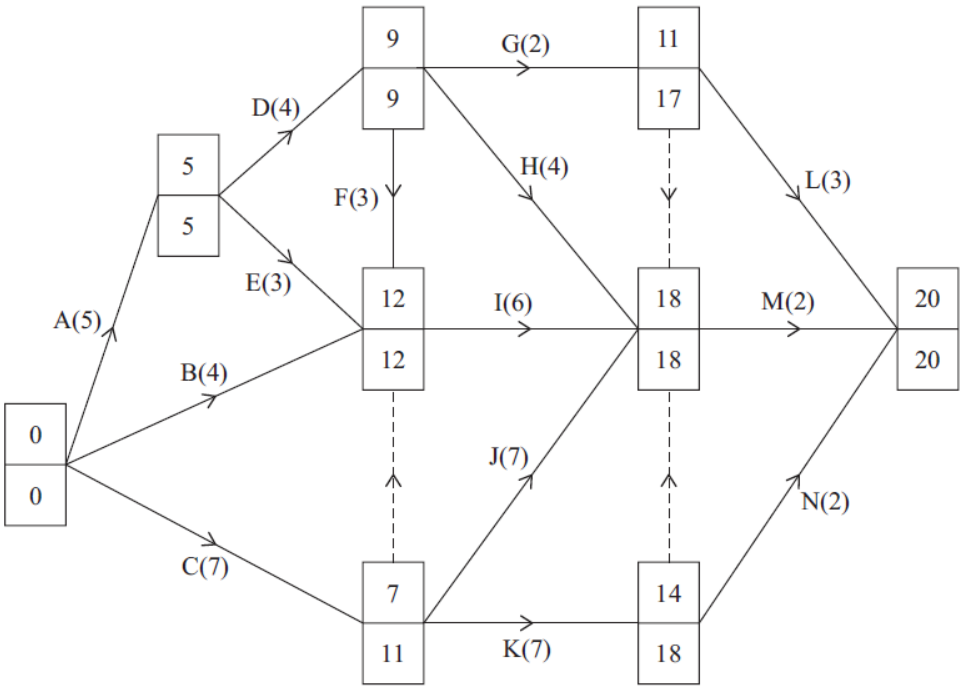
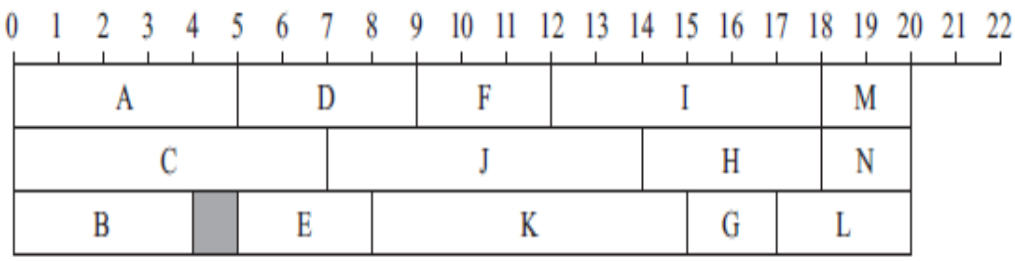
| Question Number | Scheme | Marks |
|---|---|---|
| **2. (a)(i)** |  | M1<br>A1<br>M1<br>A1 |
| **(a)(ii)** | Minimum completion time is 20 (days) | A1ft<br>**(5)** |
| **(b)** | Lower bound = $\frac{59}{20} = 2.95 = 3$ workers | B1<br>**(1)** |
| **(c)** |  | M1<br>A1<br>A1<br>A1<br>**(4)** |
| | | **10 marks** |

| | Notes for Question 2 |
|---|---|
| **ai1M1** | **All** top boxes complete, values generally increasing in the direction of the arrows ('left to right'), condone one rogue |
| **ai1A1** | CAO (top boxes) |
| **ai2M1** | **All** bottom boxes complete, values generally decreasing in the opposite direction of the arrows ('right to left'), condone one rogue. Condone missing 0 and/or their 20 (at the end event) for the M mark only |
| **ai2A1** | CAO (bottom boxes) |
| **aii3A1ft** | Follow through the top value at the end node – dependent on both M marks – if labelled must be answered in the correct part of the question |
| **b1B1** | CSO – requires both a **correct** calculation **or** 2.95 seen and 3. An answer of 3 with no working scores no marks |
| **c1M1** | Not a cascade (Gantt) chart. 5 'workers' used at most and at least 8 activities placed. **End time must be the same as their end time from the diagram in (a)(i)** |
| **c1A1** | 3 or 4 workers. All 14 activities present (just once). Condone at most **three** errors. An activity can give rise to at most three errors; one on duration, one on time interval and only one on IPA |
| **c2A1** | 3 or 4 workers. All 14 activities present (just once). Condone **one** error **either** precedence **or** time interval **or** activity length; An activity can give rise to at most three errors; one on duration, one on time interval and only one on IPA |
| **c3A1** | 3 workers. All 14 activities present (just once). No errors**.** |

For (c) the following may be useful in checking their schedule
Note J and K are interchangeable

| Activity | Duration | Time interval | IPA |
|---|---|---|---|
| A | 5 | 0 – 5 | - |
| B | 4 | 0 – 12 | - |
| C | 7 | 0 – 11 | - |
| D | 4 | 5 – 9 | A |
| E | 3 | 5 – 12 | A |
| F | 3 | 9 – 12 | D |
| G | 2 | 9 – 17 | D |
| H | 4 | 9 – 18 | D |
| I | 6 | 12 – 18 | B, C, E, F |
| J | 7 | 7 – 18 | C |
| K | 7 | 7 – 18 | C |
| L | 3 | 11 – 20 | G |
| M | 2 | 18 – 20 | G, H, I, J, K |
| N | 2 | 14 – 20 | K |