Assignment cost tables

6 questions | 16 marks

Equivalent correct methods earn the corresponding marks.

1. Use the technician table to find the cost of Ali→1, Bea→2 and Chen→3. [2 marks]

Cost ($) of assigning one technician to each job.

Technician	Job 1	Job 2	Job 3
Ali	9	2	7
Bea	6	4	3
Chen	5	8	1

Read 9,4 and 1.

9+4+1=14.

Answer: $14.

2. List all six possible job sequences for Ali, Bea and Chen. [3 marks]

Choose one of three jobs for Ali, then one of the remaining two for Bea.

Chen receives the remaining job.

Answer: (1,2,3), (1,3,2), (2,1,3), (2,3,1), (3,1,2), (3,2,1).

3. Evaluate all six technician assignments and identify the minimum. [4 marks]

Cost ($) of assigning one technician to each job.

Technician	Job 1	Job 2	Job 3
Ali	9	2	7
Bea	6	4	3
Chen	5	8	1

Use the six sequences from the preceding question.

Add the three original entries for each sequence.

The smallest total is 9.

Answer: Totals $14, $20, $9, $10, $21, $16 respectively; minimum $9 with Ali→2, Bea→1, Chen→3.

4. A table records the time each driver needs for a separate delivery. Explain one assumption needed before minimising the sum of the times. [2 marks]

The sum and the maximum are different objective functions.

The correct model must match the operational goal.

Answer: For example, the objective really is total driver-hours, not the time when the last simultaneous delivery finishes.

5. A proposed allocation uses one entry in each column but two entries in one row. Is it feasible for a standard one-to-one square assignment? [2 marks]

One person would be assigned two jobs.

Another row/person would necessarily be unassigned.

Answer: No.

6. If every selected cost in a four-person assignment is increased by $3, how much does the total increase, and does this change which complete assignment is cheapest? [3 marks]

Each complete assignment contains four entries.

Every possible total gains the same $4\times3=\$12$.

Answer: The total increases by $12; the ranking of complete assignments is unchanged.