Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

2.1

decision node (square): a point where the manager chooses between options; chance node (circle): a point where outcomes depend on chance, each with a probability

2.2

expected value $= 0.6 \times 200\,000 + 0.4 \times 60\,000 = \$144\,000$; net $= 144\,000 - 50\,000 = \$\mathbf{94\,000}$; \$94,000 > \$80,000, so launch the campaign

2.3

paths: A–B–D–F $= 3 + 4 + 5 + 2 = 14$ days; A–C–E–F $= 3 + 2 + 3 + 2 = 10$ days; critical path A–B–D–F; minimum duration **14** days; any delay on A, B, D or F delays the project

2.4

EST of E $= 3 + 2 = 5$; F cannot start until day 12, so LFT of E $= 12$; float $= 12 - 3 - 5$ $=$ **4** days; E can be delayed by up to 4 days without delaying the whole project

3.1

award up to [17]: identifies the human need (education and skills for low-income teenagers, a path to better jobs) and the key problem (grants falling from \$120,000 to \$80,000, so income of \$95,000 no longer covers costs of \$120,000: a gap of \$25,000 a year); uses at least two toolkit tools with data, e.g. SWOT (strengths: strong results, volunteer mentors; threats: falling grants), STEEPLE, force field, decision tree or a Gantt chart for the plan; evaluates the options with figures: corporate sponsorship from tech firms (fits the mission; risk of dependence); paid courses for adults or schools to cross-subsidize (uses spare evening capacity; needs marketing and time); a sliding-scale fee (raises revenue but may exclude the poorest, against the mission); considers stakeholders and ethics: students, families, volunteers, donors, the board; mission drift; a realistic plan with timeline, responsibilities, costs and funding over three years, e.g. year 1 sponsorship and a pilot adult course, year 2 expand paid courses, year 3 review; a justified conclusion linked to the human need

exercises.lol exercises.com.cn