3.1 Decision Trees and Quantitative Decision-Making: 10-minute Pack

Total Marks

AQA 7132 · Calculators not allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions in the spaces provided. Show working for every calculation. Where a question uses the Green Brew Ltd case, the necessary figures are given in that question's prompt.

1 Which one of the following best describes a 'decision tree' in a business decision context?

- ☐ A) A table showing monthly cash flows
- ☐ B) A diagram showing decision and chance nodes with outcomes and probabilities
- ☐ C) A marketing plan that lists possible product names
- ☐ D) A staff rota showing shift patterns

(Total for Question 1 is 1 mark)

2 Green Brew Ltd Option B: do nothing, keep current operations with no cost and no extra revenue. State the expected value and net gain for Option B.

(Total for Question 2 is 1 mark)

3 State one non-numeric factor Green Brew Ltd should consider that a decision tree does not capture when choosing between Option A, B and C.

(Total for Question 3 is 1 mark)

4 Define the term 'expected value' as used when completing a decision tree in business decision-making.

(Total for Question 4 is 2 marks)

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5 Green Brew Ltd considers a low-cost marketing test costing £100 that has a 0.5 probability of increasing sales by £300 and a 0.5 probability of making no gain. Calculate the expected value of the test (not net gain). Show your working.

(Total for Question 5 is 2 marks)

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6 Which option gives the highest net gain for Green Brew Ltd, using the figures in this pack? Choose one option and give its net gain in pounds.

(Total for Question 6 is 1 mark)

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Mark scheme · 3.1 Decision Trees and Quantitative Decision-Making: 10-minute Pack

Question 1

B cao **B1**

Answer: B

Question 2

states EV = 0 and net gain = 0 **B1**

Answer: Expected value = £0; Net gain = £0.

Question 3

any valid non-numeric factor, e.g. effect on brand image, staff workload, customer convenience, regulatory issues, or long-term strategic fit **B1**

Answer: For example, effect on brand image: a coffee van may improve local presence but could distract from the core cafe brand.

Question 4

a clear statement that expected value is the probability weighted average of outcomes **B1**

or equivalent, e.g. sum of each outcome multiplied by its probability **B1**

Answer: Expected value is the sum of each possible outcome multiplied by its probability, the probability weighted average of outcomes.

Question 5

0.5 x 300 + 0.5 x 0 seen **M1**

£150 cao **A1**

Answer: £150.

Question 6

identifies Option A and gives £2,600, or identifies Option C and gives £610, or Option B with 0, but correct highest is Option A 2,600 **B1**

Answer: Option A, net gain £2,600.

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