

LC 2014 (SET C): PAPER 2**QUESTION 1 (25 MARKS)****Question 1 (a)**

5 black cars, 9 red cars and 10 silver cars

Total = 24 cars

$$(i) P(\text{Black car}) = \frac{\text{Number of black cars}}{\text{Number of cars}} = \frac{5}{24}$$

$$P(\text{Event}) = \frac{\text{Number of desired outcomes}}{\text{Number of possible outcomes}}$$

$$(ii) P(\text{Black or red car}) = \frac{\text{Number of black or red cars}}{\text{Number of cars}} = \frac{5+9}{24} = \frac{14}{24} = \frac{7}{12}$$

MARKING SCHEME NOTES**Question 1 (a) (i) (ii) [Scale 10C (0, 4, 7, 10)]**

4: • Relevant work in one or both sections. e.g. either #E or #S correct

7: • One correct section

10: • Accept correct answers without work

Question 1 (b)

$$(i) P(\text{Silver and then a black car}) = \frac{10}{24} \times \frac{5}{23} = \frac{25}{276}$$

There are 10 ways to pick a silver car from 24 cars **and then** (multiply) there are 5 ways to pick a black car from the remaining 23 cars.

$$(ii) P(\text{Red and a black car}) = \frac{9}{24} \times \frac{5}{23} \times 2 = \frac{15}{92}$$

There are 9 ways to pick a red car from 24 cars **and** (multiply) there are 5 ways to pick a black car from the remaining 23 cars. However, you could have picked the red first and then the black or the other way around. Multiply your answer by 2 to take both options into account.

[AUTHORS'S NOTE: This question should not have been asked. The syllabus states quite clearly that Ordinary Level students should deal only with the probability of independent events.]

MARKING SCHEME NOTES**Question 1 (b) (i) [Scale 5C (0, 3, 4, 5)]**

3: • Any correct #E or #S

- $P(\text{silver}) = \frac{10}{24}$ and/or $P(\text{black}) = \frac{5}{23}$

4: • $(\frac{10}{24} \times \frac{5}{23})$ and stops

- Calculates the probability with replacement. $(\frac{10}{24} \times \frac{5}{23} = \frac{50}{576}$ or $\frac{25}{288})$

- Correct answer without work

Question 1 (b) (ii) [Scale 5C (0, 3, 4, 5)]

3: • Any relevant work towards creating at least one correct probability

- $[(\frac{10}{24} \times \frac{5}{23}) + (\frac{5}{24} \times \frac{9}{23})]$ and stops

- Correct answer without work

Question 1 (c)

Non-diesel: 2 black cars, 7 red cars and 6 silver cars

Diesel: 3 black cars, 2 red cars and 4 silver cars

Number of diesel cars = 9

Number of red non-diesel cars or diesel cars = $7 + 9 = 16$

Total = 24 cars

$$P(\text{Red or a diesel car}) = \frac{\text{Number of red non-diesel cars or diesel cars}}{\text{Number of cars}} = \frac{16}{24} = \frac{2}{3}$$

MARKING SCHEME NOTES**Question 1 (c) [Scale 5C (0, 3, 4, 5)]**

3: • Any relevant work towards creating at least one correct probability

• Solution presented as: $[P(\text{red or diesel}) = \frac{9}{24} + \frac{9}{24} = \frac{18}{24} \text{ or } \frac{3}{4}]$

4: • Correct answer without work