Solutions

**Section A (40 Marks)**

1. B
2. B
3. B
4. A
5. A
6. A
7. B
8. B
9. B
10. B
11. D
12. D
13. D
14. C
15. C
16. C
17. A
18. A
19. D
20. D

**Section B (60 Marks)**

Question One

**(a)**

and

**M1**

**M1**

Probability cannot be negative therefore **A1**

**(b)**

|  |  |  |
| --- | --- | --- |
| Blood type | Tally | Freq |
| A | ///// | 5 |
| B | ///// // | 7 |
| O | ///// //// | 9 |
| AB | //// | 4 |
|  |  | 25 |
| **M1** | **M1** | **A1** |

**(c)**

Any three measures of dispersion are

1. Range: The difference between the highest value and the lowest value in the data set. **A3**
2. Variance: This is the average square distance for each value from the mean. **A3**
3. Standard deviation: The average distance for each value from the mean. **A3**
4. Mean deviation: average absolute difference between each item and the mean. **A3**
5. Interquartile range: the difference between the upper quartile value and lower quartile value. **A3**
6. Quartile deviation: the average of the interquartile range. **A3**

**(d)**

**M1**

**M1**

**M2**

Commission are more variable than sales. **A1**

Question Two

**(a)**

**continuous variable** a variable that can assume all values between any two specific values. **A2**

**sample** a group of subjects selected from the population. **A2**

**random sampling** is where every member of the population must have an equal chance of being selected into the sample. **A2**

**mode** is the value that occurs most often in a data set. **A2**

**(b)**

(i) The data was obtained from a population because the data is from all engineers at the organisation. **A2**

(ii)

**M1**

|  |  |  |  |
| --- | --- | --- | --- |
| Class Limits | Class Boundaries | Tally | Frequency |
| 77 – 83 | 76.5 – 83.5 | / | 1 |
| 84 – 90 | 83.5 – 90.5 | / | 1 |
| 91 – 97 | 90.5 – 97.5 | ///// / | 6 |
| 98 – 104 | 97.5 – 104.5 | ///// ///// //// | 14 |
| 105 – 111 | 104.5 – 111.5 | ///// /// | 8 |
| 112 – 118 | 111.5 – 118.5 | / | 1 |
| 119 – 125 | 118.5 – 125.5 | / | 1 |
|  | | | 32 |
| **M1 M1 M1** | | | **A1** |

(iii) Yes, **A1**

(iv) Possible outliers are 77 and 123 **A2**

(v) The data is approximately normally distributed **A2**

Or

Most senior executives received allowances between K98,000 and K104,000. **A2**

Question Three

**(a)**

Subjective probability is a type of probability whose outcomes are based on an educated guess applying expert opinion or plain intuition **A2**

Whereas

Objective probability is a type of probability whose outcomes can be verified statistically through surveys or empirical observation. **A2**

**(b)**

and are not mutually exclusive because . **A2**

**(c)**

Mean **M1**

**M1**

**A1**

Median **A1**

Mode **A1**

**(d)**

**M1**

**A1**

**(e)**

**M1**

**M1**

**M1**

**A2**

**A2**

Question Four

**(a)**

any two rules of probability are

1. The probability of an event has to be between and inclusive zero and one. **A2**
2. If an event is certain, its probability is 1. **A2**
3. If an event cannot happen, the probability is 0. **A2**
4. The sum of all probabilities of all events in a sample space should be equal to 1. **A2**

**(b)**

Possible Cards if repetitions are allowed **A2**

Possible Cards if repetitions are not allowed **A2**

**(c)**

(i) **M1**

**A2**

(ii) **M1**

**A1**

(iii) **M1**

**A2**

**(d)**

**positive relationship**: a relationship between two variables such that as one variable increases, the other variable increases or as one variable decreases, the other decreases. **A2**

**(e)**

**A1**

**A1**

Question Five

**(a)**

5, 6, 12, 13, 15, 18, 22, 50

is between 6 and 12 **M1**

**A1**

is between 18 and 22 **M1**

**A1**

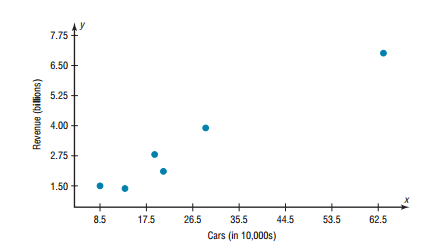
**(b)**

**(i)** Predictor Variable = Cars **A1**

Response Variable = Revenue **A1**

Revenue is influenced by the cars available **A1**

**(ii)** Scatterplot



**M2** (Labelled axes and correct scale), **A2** (accurate plots)

The data seems to follow a linear pattern. **A1**

**(iii)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Campany** | **Car** | **Revenue** |  |  |  |
| 1 | 63.0 | 7.0 | 441.00 | 3969.00 | 49.00 |
| 2 | 29.0 | 3.9 | 113.10 | 841.00 | 15.21 |
| 3 | 20.8 | 2.1 | 43.68 | 432.64 | 4.41 |
| 4 | 19.1 | 2.8 | 53.48 | 364.81 | 7.84 |
| 5 | 13.4 | 1.4 | 18.76 | 179.56 | 1.96 |
| 6 | 8.5 | 1.5 | 12.75 | 72.25 | 2.25 |
| **Totals** | **153.8** | **18.7** | **682.77** | **5859.26** | **80.67** |
|  |  |  | **M1** | **M1** | **M1** |

**M1**

**A3**

The correlation coefficient suggests a strong relationship between the number of cars a rental agency has and its annual revenue. **A1**