IQM4004

LEVEL 4 · CONTROLLED ASSESSMENT

INTO QUALIFICATIONS

Statistics and Data Analysis

Multiple-Choice Test

Candidate question paper

Duration
60 minutes

Total marks
40

Assessment window
Sample assessment

Assessment set
Set S of 2026

Response instruction
Select one answer (A–D) for each item.

Release timing
exam release

Paper
IQM4004 A1

Assessment set ID
2026-S

INTO QUALIFICATIONS LEARNER ID

DELIVERY CENTRE ID (OPTIONAL)

EXAM DATE
_____

ASSESSMENT SET
Set S of 2026

Do not open this paper until instructed. Follow the response instructions in this paper.

FOR MARKER USE ONLY

Marker initials	**Mark / 40**

About this sample assessment

Weighting: 20% of module

AI condition: Level 1 – Controlled Assessment: no AI permitted at any stage.

SAMPLE ASSESSMENT / 2026-S — Check breadth of statistical terminology, calculations, data interpretation and selection of appropriate methods under controlled conditions.

Instructions for candidates

Select one answer (A–D) for each item. One mark for the single correct option; no penalty for an incorrect or blank response.

Permitted materials: Closed-book secure test. No candidate-provided materials, notes, books or electronic/web-enabled devices permitted. Permitted calculator: Required: non-programmable, non-graphing scientific calculator. Calculators with CAS, text/image/document storage or internet capability, and phones, tablets and smart watches, are not permitted.

40 compulsory multiple-choice questions

Choose one answer for each question. Each item is worth one mark.

Q1 [1 marks]

Values are 4, 6, 8, 10. What is the mean? Options: A: 6; B: 7; C: 8; D: 28

Response guidance: Select one option A-D.

Q2 [1 marks]

For 3, 4, 4, 7, 12, the median is: Options: A: 3; B: 4; C: 6; D: 12

Response guidance: Select one option A-D.

Q3 [1 marks]

A value rises from 80 to 92. Percentage increase? Options: A: 12%; B: 13.0%; C: 15%; D: 115%

Response guidance: Select one option A-D.

Q4 [1 marks]

A monthly sales series rises from 80 units in January to 96 units in June. Which statement is correct? Options: A: The series has increased overall; B: The series has decreased overall; C: The series is constant; D: The series must be seasonal

Response guidance: Select one option A-D.

Q5 [1 marks]

A sample standard deviation is large relative to its mean. This most directly indicates: Options: A: High relative variability; B: A causal relation; C: No outliers; D: A normal distribution

Response guidance: Select one option A-D.

Q6 [1 marks]

If r=-0.82, the observed linear association is: Options: A: Strong positive; B: Weak positive; C: Strong negative; D: Proof of causation

Response guidance: Select one option A-D.

Q7 [1 marks]

A 95% confidence interval for a mean difference is (-1.2, 4.0). At the corresponding two-sided 5% test, the result is ordinarily: Options: A: Statistically significant; B: Not statistically significant; C: Proof of no effect; D: Evidence of a 95% probability the null is true

Response guidance: Select one option A-D.

Q8 [1 marks]

Which is a categorical variable? Options: A: Weekly revenue; B: Customer waiting time; C: Payment method; D: Number of orders

Response guidance: Select one option A-D.

Q9 [1 marks]

A fair coin is tossed twice. Probability of two heads? Options: A: 1/2; B: 1/3; C: 1/4; D: 3/4

Response guidance: Select one option A-D.

Q10 [1 marks]

For values 2, 5, 9, the range is: Options: A: 3; B: 7; C: 9; D: 16

Response guidance: Select one option A-D.

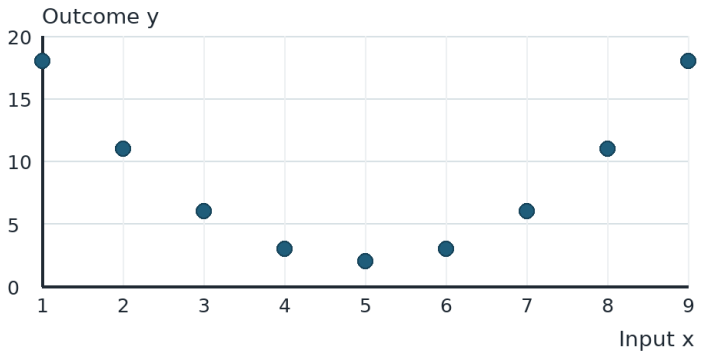
Q11 [1 marks]

A positive correlation between training hours and sales performance means: Options: A: Training necessarily causes sales; B: Higher training tends to accompany higher sales in observed data; C: Every trained employee sells more; D: The variables are identical

Response guidance: Select one option A-D.

Q12 [1 marks]

The scatterplot below shows an outcome measured at nine input values. What is the soundest conclusion? Options: A: A straight-line regression may miss the curved relationship; B: No relationship exists between input and outcome; C: The input necessarily causes the outcome; D: The outcome is constant



Response guidance: Select one option A-D.

Q13 [1 marks]

If every observation is multiplied by 3, the mean is: Options: A: Unchanged; B: Tripled; C: Increased by 3; D: Squared

Response guidance: Select one option A-D.

Q14 [1 marks]

A population parameter is: Options: A: A numerical summary of the population; B: A graph label; C: A sample observation; D: A software command

Response guidance: Select one option A-D.

Q15 [1 marks]

A time series shows repeated peaks each December. This pattern is most likely: Options: A: Seasonality; B: Random sampling; C: A median; D: Correlation reversal

Response guidance: Select one option A-D.

Q16 [1 marks]

If actual demand is 200 and forecast is 185, forecast error (actual minus forecast) is: Options: A: -15; B: 15; C: 185; D: 385

Response guidance: Select one option A-D.

Q17 [1 marks]

A £500 price is discounted by 10%. New price? Options: A: £450; B: £490; C: £550; D: £50

Response guidance: Select one option A-D.

Q18 [1 marks]

Which measure is most affected by a single extreme high value? Options: A: Median; B: Mode; C: Mean; D: Interquartile range in all cases

Response guidance: Select one option A-D.

Q19 [1 marks]

A random sample is useful mainly because it can: Options: A: Reduce selection bias, though it does not remove all error; B: Guarantee a large sample; C: Prove causation; D: Ensure no missing data

Response guidance: Select one option A-D.

Q20 [1 marks]

If P(A)=0.3, the complement probability is: Options: A: 0.3; B: 0.7; C: 1.3; D: 3

Response guidance: Select one option A-D.

Q21 [1 marks]

For a symmetric distribution without strong outliers, an appropriate centre/spread pair is: Options: A: Mean and standard deviation; B: Mode and range only; C: Maximum and minimum; D: Correlation and slope

Response guidance: Select one option A-D.

Q22 [1 marks]

A regression slope of 2.5 in a model of cost (£000) on output (hundreds of units) means predicted cost changes by: Options: A: £2.50 per unit; B: £2,500 per additional hundred units; C: 2.5%; D: £250,000 per unit

Response guidance: Select one option A-D.

Q23 [1 marks]

Which statement about a p-value is sound? Options: A: Probability the null hypothesis is true; B: Probability of results at least as extreme under the null model; C: Probability the alternative is true; D: The size of the business effect

Response guidance: Select one option A-D.

Q24 [1 marks]

A survey invited 25 selected participants. Twenty responses were received and 5 participants did not respond. The observed response rate is: Options: A: 20%; B: 75%; C: 80%; D: 125%

Response guidance: Select one option A-D.

Q25 [1 marks]

A sample is formed by selecting every tenth customer after a random starting point. This is: Options: A: Systematic sampling; B: Convenience sampling; C: Quota sampling; D: Census sampling

Response guidance: Select one option A-D.

Q26 [1 marks]

When a confidence interval for a difference includes zero, the usual 5% two-sided test is: Options: A: Significant; B: Not significant; C: Causally conclusive; D: Invalid by definition

Response guidance: Select one option A-D.

Q27 [1 marks]

Which measure is the difference between the upper and lower quartiles? Options: A: Range; B: IQR; C: Variance; D: Mean deviation

Response guidance: Select one option A-D.

Q28 [1 marks]

A forecast has absolute errors of 2, 3 and 4 units. Its mean absolute error is: Options: A: 3 units; B: 2 units; C: 4 units; D: 9 units

Response guidance: Select one option A-D.

Q29 [1 marks]

A sample mean is 50 with standard error 2. A rough 95% interval using 1.96 is: Options: A: 46.08 to 53.92; B: 48 to 52; C: 40 to 60; D: 1.96 to 2

Response guidance: Select one option A-D.

Q30 [1 marks]

In a regression model, a residual is: Options: A: Observed value minus predicted value; B: Predicted value minus the sample mean; C: The sample size divided by the slope; D: The correlation squared

Response guidance: Select one option A-D.

Q31 [1 marks]

A forecast's mean absolute error is the mean of: Options: A: Signed errors; B: Absolute errors; C: Squared percentages; D: Observed values

Response guidance: Select one option A-D.

Q32 [1 marks]

A single high-leverage point is present in a regression dataset. The main risk is that it may: Options: A: Guarantee a normal distribution; B: Strongly influence the fitted slope and correlation; C: Remove all residuals; D: Prove causation

Response guidance: Select one option A-D.

Q33 [1 marks]

The mode is: Options: A: The most frequent value/category; B: The midpoint of a range; C: The average squared deviation; D: A measure of linear association

Response guidance: Select one option A-D.

Q34 [1 marks]

A 20% increase followed by a 20% decrease returns exactly to the starting value? Options: A: Yes; B: No; net change is -4%; C: No; net change is +4%; D: Cannot calculate

Response guidance: Select one option A-D.

Q35 [1 marks]

A non-response pattern linked to customer satisfaction can cause: Options: A: Non-response bias; B: A larger population; C: Seasonality; D: A guaranteed normal distribution

Response guidance: Select one option A-D.

Q36 [1 marks]

Which statistic is calculated by dividing a sample standard deviation by the square root of the sample size? Options: A: Standard error; B: Median; C: Mode; D: Range

Response guidance: Select one option A-D.

Q37 [1 marks]

A correlation near zero means: Options: A: No relationship of any kind; B: Little linear association; a nonlinear relation may remain; C: Perfect negative association; D: Causation is absent

Response guidance: Select one option A-D.

Q38 [1 marks]

A pilot survey of 20 volunteers is used to represent all customers. Main concern? Options: A: Volunteer/self-selection bias and small sample; B: Too many observations; C: No categorical data; D: Guaranteed accuracy

Response guidance: Select one option A-D.

Q39 [1 marks]

A fitted regression model predicts y = 5 + 2x. At x = 3, the predicted value is: Options: A: 5; B: 6; C: 11; D: 16

Response guidance: Select one option A-D.

Q40 [1 marks]

In a one-way ANOVA, the null hypothesis usually states that: Options: A: All group means are equal; B: All observations are identical; C: Every group has a different mean; D: The sample has no variation

Response guidance: Select one option A-D.

Prepare and submit your work

No supplied data sheet; all information is contained in the 40 questions. Questions sample descriptive statistics, probability, percentages, graphical interpretation, data quality, inferential reasoning, correlation/regression and forecasting at introductory applied level.