STRICTLY CONFIDENTIAL

INSTITUTE OF CHARTERED ACCOUNTANTS IN MALAWI

DECEMBER 2019 EXAMINATIONS

ACCOUNTING TECHNICIAN PROGRAMME

T1.3: BUSINESS MATHEMATICS & STATISTICS

EXAMINER'S REPORT

GENERAL COMMENTS ON THE PAPER AND CANDIDATE PERFORMANCE

The Business Mathematics and Statistics examination paper was a fair representation of the course content. It covered content involving questions that demanded both recall, comprehension and application of knowledge. It gave the candidates the latitude to exhibit their understanding of the course content.

The performance can be described as satisfactory compared to previous examination diets.

Common factors leading to such performance among candidates were

a) Failure to follow instructions.

b) Lack of adequate preparation examinations

c) Inadequate syllabus coverage.

d) Weak background/foundation in mathematics.

Rationale / learning outcome being addressed by the question (refer to the syllabus)

Rationale/learning outcome addressed by each question is summarized below:

Question	Learning outcome being addressed
1a/b	Simplifying functions/calculating measures of central tendency
2a/b	Solving equations/presenting data – multiple bar chart
3a/b	Solving inequalities/computing probability
4a/b	Finding derivatives/identifying an arithmetic progression and application of the sum
5a/b	Stating interest/ computing period to maturity
6a/b	Stating importance of sampling/group data in a frequency distribution and calculating a measure of dispersion
7a/b/c	Describing data collection methods/calculating and interpreting measures of dispersion/calculating index numbers
8a/b/c	Distinguishing correlation from regression/plotting scatter diagrams, assessing relationships and calculating correlation coefficients/stating advantages and disadvantages of investment appraisal techniques.
9a/b/c	Describing components of time series/finding trend values and forecasting/applying calculus in financial mathematics.

COMMENTS ON INDIVIDUAL QUESTIONS

Question 1:

This question was on algebra and averages. The candidates were expected to expand and simplify the expression/function given. On the other hand, the candidates were also expected to use the concept of averages to find the average price per share. Some candidates had problems changing the signs while removing brackets as follows:

$$f(x)=(x-2)^2-(x+2)^2= x^2-4x+4-(x^2+4x+4)=x^2-4x+4-x^2-4x-4\ .$$

On finding the average share price, some candidates had challenges to find the total value of the shares.

Question 2:

Question 2 involved solving an equation and constructing a multiple bar chart. The equation involved indices and most candidates faced difficulties in solving it, especially obtaining the common base 2. Some candidates confused it with the component bar chart.

Question 3:

In this question, candidates were required to solve a linear inequality in part (a) and find the probability in part (b).The question was straight forward but most candidates (more than 80%) were unable to solve it as they failed to apply the addition rule.

With regard to the inequality, most candidates performed very well but failed to reverse the inequality sign after dividing by a negative number as follows:

$$-7x \geq -14$$

$$\text{i.e.} \qquad \frac{-7x}{-7} \leq \frac{-14}{-7} \ .$$

The answer should have been $x \leq 2$ as opposed to $x \geq 2$.

Question 4:

Question 4 was on differentiation and arithmetic progression. Most candidates had challenges applying the power rule to perform differentiation. As for part (b), the major challenge for others was identifying that this was an arithmetic progression while others had difficulties using the formula for calculating the sum of an arithmetic progression. Inadequate syllabus coverage could have been the cause.

Question 5:

This question was basically on interest. Candidates performed very well and it was pleasing to note how articulate they were in stating the concept of interest and application of the compound interest formula. The major challenge for some candidates was the taking of logarithms to find the number of years *n*:

$$\frac{8}{5} = 1.12^{n}$$

On taking logarithms to base 10, $n = \dfrac{\log\left(\frac{8}{5}\right)}{\log 1.12} = ...$

This could be due to lack of knowledge and practice.

Question 6:

Most candidates gave correct reasons on why researchers prefer using a sample instead of the whole population in part (a). In part (b), while a good number of candidates managed to obtain the frequency distribution a few candidates did not follow instructions to use 15 as the lowest boundary and a class width of 10. Due to this, they obtained an incorrect frequency distribution. This had an impact on the solution to the last part which required them to use the frequency obtained to find the standard deviation. Candidates should note that instructions are part of examinations hence the need to follow them.

Question 7:

This question was on data collection, variation and indices. The candidates performed well on describing observation and formal interview as data collection methods although some had challenges expressing themselves in correct English.

On calculation of coefficient of variation, a few managed to get the correct solutions. Most candidates had challenges interpreting the results that a larger coefficient of variation implied that there was greater variation in output. This could be due to inadequate syllabus coverage and practice.

Part c) was on indices. The majority had challenges finding the simple aggregate index which involved dividing the sum of prices in the current year by the sum of prices in the base year multiplied by one hundred. Finding the Paasche price index was a challenge to most candidates due to failure to apply the formula $I = \frac{\sum P_1 Q_1}{\sum P_0 Q_1} \times 100.$

Most candidates failed to realise that they had to find the price of products and quantities and adding them instead of just finding one concept only.

Question 8:

Question 8 was on regression and advantages and disadvantages of payback period as a method of investment appraisal. Most candidates failed to indicate that correlation was the strength or degree of the relationship between variables while regression was a procedure for investigating relationships between variables.

In part (b) the majority of candidates managed to plot the scatter graph although a few did not follow the instruction to put expenses on the horizontal axis. Further a number of candidates failed to find the Spearman's rank correlation coefficient. This was due to the fact that they did not break ties in ranks or did not do any ranking at all.

The last part on payback period was well done although some candidates showed that they did not know that it was an investment appraisal method even though the question indicated that.

Question 9:

This was the most unpopular question in Section B. Most candidates did not attempt it, possibly due to lack of knowledge. It was on time series and marginal functions. Those that attempted this question managed to describe one component of time series. The most popular was the trend.

In part (b), most candidates managed to obtain the least squares regression line. One or two candidates overlooked the coding of the years and hence got stuck. Others had challenges obtaining an estimate for Year 2020 which they should have done by substituting the code for 2020 in the regression line equation.

Most candidates performed poorly on the last part on marginal revenue function. They failed to detect that to obtain a revenue function they needed to integrate the marginal revenue function as follows $R = \int (12 - 0.0004x)dx = 12x - 0.0002x + C$ and then use the condition provided to find C.

In general, candidates were supposed to carry out calculations step by step to earn high marks. Most candidates failed to follow instructions and also to use correct formulae. A number of candidates seem not to know the meaning of the different action verbs, like 'state' or 'describe' e.g. in Q9a: *Describe any one component of a time series* most candidates would just list the points. This led to loss of marks.

RECOMMENDATIONS

Candidates should;

a) Follow given instructions.

b) Not copy the questions because precious time is wasted by doing that.

c) Cover the syllabus thoroughly.

d) Learn to apply the formulae correctly.

e) Read the questions carefully to enhance understanding of what is required.

Lecturers should;

a) Help the candidates to cover the whole syllabus.

b) Aim at helping candidates to acquire more knowledge and skills always.

c) Teach/coach candidates on how to answer questions by exposing them to practice questions and giving them feedback.