

STRICTLY CONFIDENTIAL

THE INSTITUTE OF CHARTERED ACCOUNTANTS IN MALAWI

DECEMBER 2015 EXAMINATIONS

ACCOUNTING TECHNICIAN PROGRAMME

PAPER TC3: BUSINESS MATHEMATICS & STATISTICS

EXAMINER'S REPORT

INTRODUCTION

The paper had two sections, A and B, with questions covering adequately the syllabus. The paper aimed at testing the candidates' understanding of mathematical and statistical principles and their application in business. This report provides a summary of the candidates' general performance, on individual questions and recommendations/suggestions for future examination attempts.

GENERAL COMMENTS

In general, the candidates did not perform very well. It was clear that many candidates had problems with questions involving probability, calculus and linear programming. However, there was an improvement in the candidates' handling of questions involving data presentation, index numbers and investment appraisal. Questions that demanded analysis and application were generally not well answered. Candidates obtained good marks from questions that called for recall and explanation.

All in all, the candidates' performance did not reflect the fairness of the paper. The expectation was that candidates would perform better had they prepared well for the examination.

COMMENTS ON INDIVIDUAL QUESTIONS

Section A was compulsory while in section B candidates were asked to answer any two of the three questions. Almost all candidates did not attempt Question 8 from Section B, which was on probability and linear programming.

QUESTION 1

Question 1 was on calculus.

In part (a), most candidates evaluated $f(10)$ instead of $f'(10)$. They were supposed to differentiate $f(x) = x^3 - 2x + 4$ to obtain $f'(x) = 3x^2 - 2$ into which they should have substituted 10.

In part (b), it was clear that the candidates were not familiar with integration, let alone evaluating the definite integral $\int_a^b f(x) dx$. Candidates need to be able to integrate and then apply the Fundamental Theorem of Calculus to evaluate definite integrals.

QUESTION 2

In part (a) the candidates were asked to simplify the expression but a good number of candidates seemed to be solving an equation. Even after getting a common denominator of 12, candidates eliminated 12 and erroneously got the answer $-x - 13$ instead of $\frac{-x - 13}{12}$.

In part (b), a majority of the candidates managed to do cross multiplication to solve the equation. However, they made wrong expansions because they missed out brackets as follows: $y - 3(2y + 5) = 2y \times y$ instead of $(y - 3)(2y + 5) = 2y \times y$.

QUESTION 3

Question 3 was on Geometric mean and Geometric Progression (GP). Most candidates calculated the arithmetic mean instead, hence got it wrong. The difficult part was to find the appropriate multipliers to be used in finding the average.

In part (b), some candidates mistook the problem for an arithmetic progression instead of the Geometric Progression. On the application of the Geometric Progression formula, some candidates erroneously expanded the brackets of $4372 = \frac{4(1-3^n)}{1-3}$ as $4372 = \frac{4-12^n}{1-3}$ and hence obtained a wrong answer. The other mistake by candidates was equating the sum of the GP to the n th term of the GP.

QUESTION 4

This question was on financial mathematics, focusing on the time value of money. A number of candidates showed lack of knowledge of the concept of time value of money.

Part (b) was fairly well tackled by candidates by using the Future Value formula $FV = P(1+r)^n$. However, difficulties were faced in finding the number of periods to be applied in the formula since annual interest was compounded monthly. Candidates were supposed to use $12 \times n$ and also use $\frac{0.06}{12}$ as the rate to solve for n . It appears candidates are used to calculating interest annually as opposed to compounding monthly or bi-annually.

QUESTION 5

Question 5 was on ratios and simultaneous equations.

In part (a), which was on ratios, the number of rooms confused some candidates as they used them as ratios instead of the given ratios of 5:3:2. Other candidates calculated the number of all luxury rooms and stopped there instead of a single luxury, sign of not understanding the question.

Part (b) was fairly well done although some candidates faced difficulties in forming simultaneous equations to help them solve the problem. After forming simultaneous equations, other candidates failed to use the familiar methods for solving simultaneous equations such as substitution or elimination.

QUESTION 6

Candidates were asked to define a random sample

in part (a) and how they would draw a random sample from a set of 20 ICAM candidates. Instead of emphasizing on members of the population having an equal opportunity of selection, some candidates erroneously believe a random sample is a 'technique' of selecting members 'without order'!

Part (b) of the question was on data tabulation, Candidates performed fairly well in this question. Some candidates drew three different tables for each year, though it was possible to incorporate the information given in a single table.

QUESTION 7

This was one of the most popular questions among the candidates. It was on index numbers and investment appraisal.

Candidates that had difficulties with index numbers, was mainly due to their failure to apply the formulas. In the formula $\sum \frac{p_0q_1}{p_0q_0}$, candidates were supposed to evaluate products p_0q_1 and p_0q_0 before summing them instead of summing the individual components p and q as they had done. Besides this, some candidates have the tendency of attaching units to the calculated index such as Kwacha or %.

Part (b) was on investment appraisal, challenges faced involved failure to find correct discount factors using the formula $(1+r)^{-n}$. For those that got the correct discount factors, the challenge was that candidates rounded the factors to various decimal places (eg 2 or 3 or 4 decimal places). This affected the calculation of the IRR as the totals of the present values differed as a result of the use of different numbers of decimal places. Furthermore, other candidates did not follow the instruction that they use the Internal Rate of Return method, instead they used the Net Present Value Method. Otherwise, most candidates performed very well.

QUESTION 8

Question 8 was the most shunned question in Section B. The question was on time series, probability and linear programming.

Candidates that attempted this question were unable to formulate the objective function with its corresponding constraints. Other candidates formed equations instead of inequalities. On probability, a few candidates managed to solve part (b) (i) using the addition law of probability but failed to do the second part which involved conditional probability.

QUESTION 9

The last question was on data presentation using appropriate charts/graphs.

In part (a), some candidates spent valuable time defining continuous and discrete data yet the question asked on ways of presenting such data. In addition, other candidates gave examples of continuous and discrete data when that is not what they were asked.

In part (b), while candidates were able to calculate cumulative frequencies the quality of the ogives produced were not of high standard. Consequently, it was difficult for candidates to use the ogives to obtain near accurate quartiles. They also failed to interpret the results obtained.

CONCLUSION

Overall, the question paper was a fair combination of questions that required analysis, calculation and the ones requiring description of concepts. The question paper made a thorough coverage of the syllabus.

As has been the case in previous examination diets, candidates appeared not to have been fully prepared for the examination. This is evident from their failure to tackle certain questions such as simplifying expressions, applying formulae, solving equations, probability, linear programming and calculus problems. Extra effort should be made by candidates to understand topics in Calculus and Probability.

RECOMMENDATION/SUGGESTIONS

The following suggestions are made for future examinations:

- (1) Most candidates appeared not to have been fully prepared for the examination. This clearly showed in the way they tackled questions while others opted not to answer some questions. Candidates have no choice but to cover the whole syllabus thoroughly.
- (2) Candidates must make an effort to understand concepts in non-traditional areas such as Calculus, Linear Programming and Probability.

- (3) Candidates must also make an effort to understand the various concepts that are part of the syllabus.
- (4) Candidates need to follow instructions that come with each question.
- (5) Candidates must also use graph paper for questions where they need to sketch graphs.
- (6) Candidates should master the use of their calculators.
- (7) Candidates should ensure that they begin each answer on a fresh page as per instruction on the front (cover) page.
- (8) Candidates should not copy the question, but just answer the question. It is unnecessary and time wasting.

