

EXAMINATION NO. _____

THE PUBLIC ACCOUNTANTS EXAMINATION
COUNCIL OF MALAWI

2013 EXAMINATIONS

ACCOUNTING TECHNICIAN PROGRAMME

PAPER TC 3: BUSINESS MATHEMATICS & STATISTICS

TUESDAY 28 MAY 2013

TIME ALLOWED: 3 HOURS
9.00 AM - 12.00 NOON

INSTRUCTIONS

1. You are allowed **15 minutes** reading time **before the examination begins** during which you should read the question paper and, if you wish, make annotations on the question paper. However, you are **not** allowed, **under any circumstances**, to open the answer book and start writing or use your calculator during this reading time.
2. Number of questions on paper - 9.
3. The paper is divided into **Sections A** and **B**. **ALL** questions to be answered in **Section A** and **ANY TWO** from **Section B**.
4. The maximum number of marks for each answer is indicated against each question.
5. Mathematical Tables, Formulae Sheets and Graph Paper are provided.
6. Use of non-programmable calculators is allowed.
7. Show all your workings in order to gain full marks. Method marks will be awarded throughout.
8. Final answers must be given correct to 2 decimal places where necessary.
9. Begin **each** answer on a fresh page.
10. **DO NOT OPEN THIS PAPER UNTIL YOU ARE INSTRUCTED BY THE INVIGILATOR.**

This question paper contains 5 pages

This question paper must **not** be removed from the examination hall.

SECTION A**Answer ALL Questions from this Section**

1. (a) Evaluate the following and give the answer in its simplest form:

$$\left(3\frac{1}{2} - 2\frac{1}{8}\right) \text{ of } 3\frac{1}{11} - 2\frac{5}{6}$$

5 Marks

- (b) Find the value of $p = mt - (n - t)$, given that $m = -3$, $n = 2$ and $t = -1$.

3 Marks**(TOTAL : 8 MARKS)**

2. (a) Use factorization to solve the following quadratic equation: $3x^2 - 4x - 7 = 0$.

5 Marks

- (b) A student purchases a calculator marked K1,800 with successive discounts of 10% and 15%.

Required:

How much did she pay for the calculator?

4 Marks**(TOTAL : 9 MARKS)**

3. (a) The line L_1 has the equation $3x + 5y - 2 = 0$. Another line, L_2 , is drawn perpendicular to L_1 and passes through the point (3, 1).

Required:

- (i) Find the gradient of L_1 .

2 Marks

- (ii) Find the equation of L_2 in the form $y = mx + c$, where m and c are constants.

3 Marks

- (b) Suppose that $\frac{dy}{dx} = 5x^{\frac{1}{2}} + x\sqrt{x}$, when $x > 0$. Given that $y = 35$ at $x = 4$,

Required:Find y in terms of x , giving each term in its simplest form.**7 Marks****(TOTAL : 12 MARKS)****Continued/.....**

4. (a) It is known that 35% of companies in an industrial estate own their premises and 65% employ more than 50 people. Assume that “owning premises” and “employing” are independent events.

Required:

What is the probability that a company owns its premises or employs more than 50 people?

5 Marks

- (b) A dealer mixes two varieties of tea costing K5,000 per kg and K6,000 per kg in the proportion 5:1. He sold 6 kg of the mixture at K5,500 per kg.

Required:

Find his profit.

5 Marks

(TOTAL : 10 MARKS)

5. (a) Name **two** measures of central tendency and **two** measures of dispersion.

4 Marks

- (b) The Auditor of Okhulupirika Accountants selected 100 invoices and examined them for errors. He found a range of errors in both the company's favour, which he marked with a plus, and in the suppliers' favour which he marked with a minus. The results of his audit are set out as follows:

Error (K)	Frequency
- 50 to - 40	1
- 40 to - 30	3
- 30 to - 20	4
- 20 to - 10	14
- 10 to 0	45
0 to + 10	20
+ 10 to + 20	6
+ 20 to + 30	4
+ 30 to + 40	2
+ 40 to + 50	1

Continued/.....

Required:

Find:

- (i) the mean 5 Marks
- (ii) standard deviation of the data. 4 Marks

(TOTAL : 13 MARKS)

6. As the best PAEC student, you have been requested to make a presentation on data collection methods using questionnaires and the telephone interview.

Required:

Briefly explain the **two** data collection methods and cite **one** advantage and **one** disadvantage of each method.

8 Marks
(TOTAL: 8 MARKS)**SECTION B****Answer Two Questions Only from this Section**

7. (a) Divide K62,000 in 3 parts such that the interests for the three parts for 2, 3 and 5 years respectively, at 5% simple interest p.a., are the same. 13 Marks
- (b) (i) State the reason why the use of a multiple bar chart is preferred to other charts. 2 Marks
- (ii) The following table shows a country's exports and imports for the period 2007 - 2011.

Year	Imports	Exports
2007	7930	4260
2008	8850	5225
2009	9780	6150
2010	11720	7340
2011	12150	8145

Required:

Using the data in the table, construct a clearly-labelled multiple bar chart.

5 Marks
(TOTAL: 20 MARKS)

8. Amangwetu Enterprises is planning to purchase additional equipment for its solar panel manufacturing plant located near Mpondasi village in Mangochi. The equipment will cost K60 million. The Company Accountant estimates the following cash flows:

Year	1	2	3	4
Cash Flows (K million)	24	29	21	4

At the end of year 4 the equipment will have a disposal value of K5 million. The company uses a cost of capital of 16% for investment proposals.

Required:

- (a) Calculate:

- (i) the Net Present Value (NPV) of the project. **4 Marks**
- (ii) the Internal Rate of Return (IRR) on the project, using 18% as the other cost of capital. **4 Marks**

The company also wishes to determine the best method of financing the project. The following options are available:

- Bank Loan of K60 million repayable at the end of year 4 with an interest of 14% payable each year.
- Lease the equipment for 4 years at a rental of K16 million per year, payable at the end of each year. Assume a discount rate of 14%.
- Hire-purchase with an initial payment of K14 million and 4 annual payments of K14 million. Assume a discount rate of 14%.

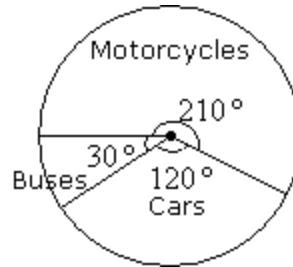
Required:

- (b) Advise Amangwetu Enterprises on the best method of financing the project.

12 Marks
(TOTAL: 20 MARKS)

Continued/.....

9. (a) The following pie chart shows a survey of the numbers of cars, buses and motorcycles that pass through a particular junction. 150 buses passed through the junction.



Required:

- (i) Calculate the percentage of cars that passed through the junction. **2 Marks**
 - (ii) Calculate the total number of motor vehicles in the survey. **4 Marks**
 - (iii) How many cars passed through the junction? **2 Marks**
- (b) (i) Define the term 'sampling'. **1 Mark**
- (ii) Give any **three** reasons for sampling. **3 Marks**
- (c) There are many sampling methods. Two of the methods are stratified sampling and multi-stage sampling.

Required:

- (i) Briefly describe each of the **two** sampling methods, explaining what each involves. **4 Marks**
- (ii) For each of the **two** sampling methods, give **one** advantage and **one** disadvantage. **4 Marks**

(TOTAL: 20 MARKS)

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