

Examination No. \_\_\_\_\_

**THE PUBLIC ACCOUNTANTS EXAMINATION**  
**COUNCIL OF MALAWI**

**2011 EXAMINATIONS**

**ACCOUNTING TECHNICIAN PROGRAMME**

**PAPER TC 3: BUSINESS MATHEMATICS &  
STATISTICS**

TUESDAY, 29 NOVEMBER 2011

TIME ALLOWED: 3 HOURS  
9.00AM - 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 4 pages

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

**SECTION A****ANSWER ALL QUESTIONS IN THIS SECTION**

1. (a) Evaluate:

$$2 - \left(1 - \frac{1}{7}\right) \left(\frac{2}{3} + \frac{1}{2}\right)$$

**4 Marks**

- (b) Solve the following quadratic equation by factoring:

$$3x^2 - 18x + 15 = 0$$

**4 Marks**

- (c) Find the equation of the straight line which passes through the points (1,3) and (-1,-1).

**4 Marks****(TOTAL : 12 MARKS)**

2. The following data shows the values of property handled by a property dealer over a six-month period.

23	16	24	13	32	42	28	18	33	15
20	23	25	27	19	29	31	14	36	26
24	10	39	23	17	22	16	23	24	28

**Required:**

- (a) Construct a frequency distribution using classes of width 5. Let 10 be the lower boundary of the smallest class.
- 3 Marks**

- (b) Draw a histogram to represent the distribution in (a) above.
- 4 Marks**

- (c) State any
- two**
- reasons for presenting data in a histogram form.
- 2 Marks**
- 
- (TOTAL : 9 MARKS)**

3. (a) Evaluate

$$\int_{-1}^2 (x^2 - 4x + 12) dx$$

**4 Marks**

- (b) Evaluate
- $y^2 - p$
- given that
- $p = -5$
- and
- $y = 4$
- .
- 2 Marks**

- (c) A shopkeeper marks her goods to gain 35%. She allows 10% discount for cash.

**Required:**Calculate her percentage profit when the goods are sold for cash. **4 Marks**  
**(TOTAL : 10 MARKS)**

Continued/.....

4. An Estate Agent released the following daily sales figures for the past 14 weeks.

Houses sold	Number of days on which sales were made
0	2
1	17
2	30
3	26
4	15
5	6
6	2

**Required:**

- (a) Compute the total number of houses sold during the 14 week period. **2 Marks**
- (b) Find the mode and median of the number of houses sold. **5 Marks**
- (c) If the average selling price was K1,160,000 and the agent's commission was 10%, how much commission did the Estate Agent earn over the period? **3 Marks**  
**(TOTAL : 10 MARKS)**
5. (a) State the difference between a 'sinking fund' and 'an annuity'. **2 Marks**
- (b) An item is bought for K10,000 and is to be depreciated at a fixed rate of 40% per annum.

**Required:**

- What will be the value of the item at the end of four years? **3 Marks**
- (c) A company has bought an asset with a life span of four years. At the end of the four years, a replacement asset will cost K12,000, and the company has decided to provide for this future commitment by setting up a sinking fund into which equal investments will be made, starting at year 1 (one year from now). The fund will earn interest at 12% per annum.

**Required:**

- Calculate the annual payment into the fund. **5 Marks**  
**(TOTAL : 10 MARKS)**

Continued/.....

6. (a) Solve the following simultaneous equations algebraically:

$$5x + 2y = 34$$

$$x + 3y = 25$$

**5 Marks**

- (b) An employee is to be remunerated in such a way that she gets K10,000 at the end of the first month, K30,000 at the end of the second month, K50,000 at the end of the third month and so on.

**Required:**

If this pattern is to be followed, after how many months will the employee receive K430,000?

**4 Marks**

**(TOTAL : 9 MARKS)**

**SECTION B**

**ANSWER TWO QUESTIONS ONLY FROM THIS SECTION**

7. Briefly describe how each of the following methods could be used by a brewery company to test the market for a new canned beer. State the relative advantage and disadvantage of each method.

(a) Simple random sampling. **5 Marks**

(b) Stratified sampling. **5 Marks**

(c) Cluster sampling. **5 Marks**

(d) Quota sampling. **5 Marks**

**(TOTAL : 20 MARKS)**

8. A company has monitored the amount of business generated by its sales representatives and the results for 2011 are recorded below:

Sales value (K'000)	Number of sales representatives
8 but less than 10	3
10 but less than 20	20
20 but less than 30	50
30 but less than 50	20
50 but less than 80	7

**Required:**

(a) Calculate

(i) the mean sales value. **4 Marks**

(ii) the standard deviation of the sales values. **4 Marks**

**Continued/.....**

- (b) (i) Construct a cumulative frequency curve of the data. **6 Marks**  
(ii) From your curve, determine the median sales value. **2 Marks**
- (c) In the previous year 2010, the mean was K25,200, the median was K20,150 and the standard deviation was K10,130. Find the coefficients of skewness for 2010 and 2011. Comment on the changes in the sales values from 2010 to 2011. **4 Marks**  
**(TOTAL : 20 MARKS)**

9. (a) The profit from a daily production run is given by  $p$  (in thousand Kwacha), which is a function of the level of production,  $x$ .

**Required:**

If  $\frac{dp}{dx} = 22 - 4x$  and one breakeven point is known to be a production of 3 units;

Find:

- (i)  $p$  as a function of  $x$  **2 Marks**  
(ii) the other breakeven point **6 Marks**  
(iii) the daily production run that gives the maximum profit **3 Marks**  
(iv) the value of the maximum daily profit. **2 Marks**
- (b) A firm has tendered for two independent contracts. The probabilities of obtaining the contracts are as follows:

Probability of obtaining contract A = 0.4  
Probability of obtaining contract B = 0.1

**Required:**

Find the probability that the firm:

- (i) will obtain both contracts **2 Marks**  
(ii) will obtain exactly one contract. **5 Marks**

**(TOTAL : 20 MARKS)**

**E N D**