

THE PUBLIC ACCOUNTANTS EXAMINATIONS BOARD

A Committee of the Council of ICPAU

CPA (U) MODEL EXAMINATIONS

LEVEL ONE

QUANTITATIVE TECHNIQUES - PAPER 5

APRIL 2008

INSTRUCTIONS TO CANDIDATES

1. Time allowed: **3 hours**
2. Attempt **three** questions in Section **A** and **two** questions in Section **B**
3. Section A has **four** questions and only **three** are to be attempted. Each question carries 20 marks.
4. Section B has **three** questions and only **two** are to be attempted. Each question carries 20 marks
5. Please read further instructions on the answer booklet.

SECTION A**Question 1**

- (a) Define the term “descriptive statistics”. (2 marks)
- (b) Explain the following terms:
- (i) Kurtosis (2 marks)
 - (ii) Skewed data (2 marks)
 - (iii) Standard deviation (2 marks)
 - (iv) Mode (2 marks)
- (c) A charitable organisation decided to give elderly people, who are sixty years and above, a daily allowance. The scale for the allowances was fixed as follows:

| Age group | Shs per day |
|-----------|-------------|
| 60-65 | 2,000 |
| 65-70 | 2,500 |
| 70-75 | 3,000 |
| 75-80 | 3,500 |
| 80-85 | 4,000 |

The ages of 25 old people who secured the allowance outright are as given below:

74 62 72 61 83 72 81 64 71 63 61 84 60
67 64 79 73 75 76 69 68 78 66 67 72

Required:

Calculate the mean daily allowance payable per person and the standard deviation.

(10 marks)
(Total 20 marks)

Question 2

- (a) Give **four** limitations of index numbers. (4 marks)
- (b) An insurance company sells policies to 5 men, all of identical age and good health. According to actuarial tables, the possibility that a man of this particular age will be alive in 30 years' time is $\frac{2}{3}$.

Required:

Find the probability that in 30 years' time at least:

- (i) one man will be alive.
 - (ii) three men will be alive. (6 marks)
- (c) A bodaboda cyclist is expected to remit an average of Shs 7,000 to his employer on a daily basis. A sample test revealed that a particular bodaboda cyclist had remitted the following returns: Shs 7,400, Shs 5,000, Shs 6,800, Shs 10,400, Shs 6,000 and Shs 4,000 on different days.

Required:

Using a t-test at 5% level of significance, conclude whether his returns are below standard or not.

(10 marks)**(Total 20 marks)****Question 3**

- (a) Explain **two** types of errors in testing hypotheses. Suggest ways of how they can be reduced.

(6 marks)

- (b) The following table gives the number of trained and untrained accounting clerks who commit errors and those who do not in a large organization:

| | Number committing errors | Number not committing errors | Total |
|-----------|--------------------------|------------------------------|-------|
| Trained | 70 | 530 | 600 |
| Untrained | 155 | 745 | 900 |
| Total | 225 | 1,275 | 1,500 |

Data consultancy wishes to know the effectiveness of training in preventing error in accounts.

Required:

Using X^2 test, test the effectiveness of training in preventing errors at 5% level of significance.

(14 marks)**(Total 20 marks)****Question 4**

- (a) Justify the validity or non-validity of the statement: "A positive value of correlation between **x** and **y** implies that if **x** decreases **y** increases".

(2 marks)

- (b) In a sample of 12 families of aged parents, the weight of husband and wife were as follows:

| | | | | | | | | | | | | | |
|---|-------------------|----|----|----|----|----|----|----|----|----|----|----|----|
| X | Weight of husband | 65 | 63 | 67 | 64 | 68 | 62 | 70 | 66 | 68 | 67 | 69 | 71 |
| Y | Weight of wife | 68 | 66 | 68 | 65 | 69 | 66 | 68 | 65 | 71 | 67 | 68 | 70 |

- (i) Find the equation of the least squares of Y on X.

(8 marks)

- (ii) Calculate the Correlation Coefficient between X and Y.

(10 marks)**(Total 20 marks)**

SECTION B**Question 5**

(a) Describe the assumptions upon which linear programming models are based.

(8 marks)

(b) An artist requires the following materials to produce pieces for exhibition at UMA Showground:

32 grams of pink paint (P)

22 grams of yellow paint (Y)

30 grams of blue paint (B)

A standard piece requires 4 grams of pink paint, 2 grams of yellow paint and 2 grams of blue paint whereas a large piece requires 2 grams of pink paint, 4 grams of yellow paint and 6 grams of blue paint.

Required:

If the standard piece costs Shs 360,000 and large piece at Shs 600,000, using graphical method, determine how many pieces he should produce to obtain maximum benefit from the exhibition.

(12 marks)

(Total 20 marks)

Question 6

A businessman from Arua saved some money for investment. He has in mind two projects; I and II. The expected cash flows from the projects are as follows:

| PROJECT I | | PROJECT II | |
|------------------|--------------------|-------------------|--------------------|
| Cash flow | Probability | Cash flow | Probability |
| Shs '000' | | | |
| 4,000 | 0.3 | 12,000 | 0.1 |
| 6,000 | 0.4 | 6,000 | 0.6 |
| 8,000 | 0.3 | 4,000 | 0.3 |

Required:

As a 'risk-averse' decision maker, which project would you advise this businessman to undertake and why?

(20 marks)

Question 7

(a) Petero Kapere, a business consultant, has developed models for his client for revenue generated (R) and cost incurred (C) during production. The models developed are as follows:

(i) Revenue (R) = $600Q + 6Q^2$

(ii) Costs (C) = $15Q^2 + 15Q + 45$

The objective of this consultancy assignment was to advise the client on how to maximise profits.

Assuming that you were the consultant:

- (i) What quantity would you advise them to produce so as to maximise profits?
(4 marks)
 - (ii) What price would you recommend to achieve their objective?
(4 marks)
 - (iii) Compute the maximum profit expected.
(5 marks)
- (b) Excell Computer experts manufacture and sell computer chips per week. The weekly cost and revenue equations are $C = 5,000 + 2n$; $R = 10n - n^2/1,000$ and $0 \leq n \leq 8,000$.

Required:

Find the approximate changes in revenue and profit if production increases from 2,000 to 2,010 chips per week.

(7 marks)

(Total 20 marks)

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