

ZIMBABWE EZEKIEL GUTI UNIVERSITY



FACULTY OF COMMERCE

**DEPARTMENT OF BUSINESS STUDIES
B. COM MARKETING**

COURSE: QUANTITATIVE ANALYSIS FOR BUSINESS

COURSE CODE: CBM103

26 JULY 2017

DURATION: 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. No cell phones are allowed in the examination venue.
2. Begin each question on a new page.
3. Answer **all** questions.

ADDITIONAL REQUIREMENTS:

1. Students must bring calculators
2. Statistical tables and formulae are provided

Question 1

- a) Explain three reasons for Sampling (3 marks)
- b) Give two examples of sampling frame (2 marks)
- c) Describe fully how you would apply stratified random sampling in drawing up a sample of 10 students from a class of 50 students who are in the same room arranged in columns of 5 (3 marks)
- d) Compare and contrast stratified random sampling and cluster sampling (4 marks)
- [Total: 12 marks]**

Question 2

Consider the following data

81 62 51 77 72 42 71 71 35 92 82 81 32 61 21 62 21 32 22 42 41 61 62 91

- (a) State TWO measures of central tendency that are not affected by outliers (2 marks)
- (b) For these data calculate and interpret the
- (i) range, mean, mode and median (8 marks)
 - (ii) sample standard deviation (3 marks)
 - (iii) coefficient of variation (3 marks)
 - (iv) lower quartile (4 marks)
- [Total: 20marks]**

Question 3

- a) Explain what break-even analysis is as used in quantitative techniques is (3 marks)
- b) Puda Development Company (PDC) is a small real estate developer operating in the Eastland's Valley. It has seven permanent employees whose monthly salaries are given below:

| Employee | Monthly salary (\$) |
|----------------------|---------------------|
| Managing Director | 100,000 |
| Manager, Development | 60,000 |
| Manager, Marketing | 45,000 |
| Project Manager | 55,000 |
| Finance Manager | 40,000 |
| Office Manager | 30,000 |
| Receptionist | 20,000 |

PDC leases a building for \$20,000 per month. The cost of suppliers, utilities and leased equipment runs for another \$30,000 per month. PDC builds only one style house in the valley. Land for each house costs \$550,000 and lumber, supplies and others run for another \$280,000 per house. Total labour costs amount to \$200,000 per house. The one sales representative of PDC is paid a commission of \$20,000 on the sale of each house. The selling price of the house is \$1,150,000. Below shows number of commercials and respective sales volume generated by Grace Holdings in consecutive 10 weeks.

Required:

- i) Identify all the costs and denote the marginal revenue and marginal cost for each hour (4 marks)

ii) Determine the monthly cost function; $C(x)$, revenue function; $R(x)$ and the profit function; $P(x)$ (4 marks)

iii) Determine the break-even point for monthly sales of the houses. (3 marks)

iv) (iv) Determine the monthly profit of 12 houses per month is build and sold. (2 marks)

(c) What are some of the simplifying assumptions in part (b) above? (4 marks)

[Total: 20 marks]

Question 4

a) Given that A and B are events such that $P(A) = 3/5$, $P(B) = 1/5$ and $P(A/B) = 2/5$

i) Calculate the probability of B occurring given that A has occurred (4 marks)

ii) Find the probability that at least one of A or B has occurred, that is probability of either A or B (2 marks)

iii) Hence find the probability of A given that at least one of A or B has occurred (2 marks)

b) Two people, a medical doctor and a mechanical engineer, have just given you subjective probabilities for the life expectancy of a cancer victim. Whose probability are you likely to consider and why? (2 marks)

c) A bag contains 7 marbles, 3 green and 4 yellow and one marble is randomly chosen

i) What is the probability of picking a green marble if one red marble is added to the to the bag marble if one red marble is added to the bag? (2 marks)

ii) If after adding the red marble in part (i) ,2 yellow marbles are removed, what is the probability of picking a green marble (2 marks)

d) The weight of the mealie meal consumed by a household per month is normally distributed with mean 50kg and standard deviation 6kg. A household is randomly selected and its monthly mealie meal consumption is noted

i) What is the probability that the household consumed more than 40 kgs of mealie meal; (2 marks)

ii) Calculate the probability that the household consumed between 55 kgs and 60kgs (2 marks);

[Total 18 marks]

Question 5

(a) When deciding to use either the Paasche index or Laspeyre index which important aspects should be considered (4 marks)

b) The following data show the price of each item and the average quantities purchased by an organisation each week

| Commodity | 2015 | | 2016 | |
|-----------|------------|----------|------------|----------|
| | Price (\$) | Quantity | Price (\$) | Quantity |
| Beef | 30 | 70 | 40 | 90 |
| Fish | 60 | 40 | 55 | 50 |
| Chicken | 55 | 50 | 80 | 30 |
| Salt | 20.5 | 110 | 20.5 | 160 |
| Sugar | 70 | 30 | 100 | 20 |

Calculate

i) Laspeyre price index (4 marks)

ii) Paasche price index and (4 marks)

iii) Fisher's price index

(4 marks)

[Total: 16 marks]

Question 6

The following data gives the data for two variables which are suspected to be linearly related with y being the dependant variable.

| | | | | | | | |
|---|------|------|------|------|------|------|------|
| x | 19.8 | 20.1 | 21.2 | 21.6 | 22.6 | 23.0 | 24.8 |
| y | 4.9 | 6.1 | 5 | 12.2 | 7.9 | 13.3 | 12.2 |

- a) Give an interpretation of coefficient of determination (1 mark)
- b) Determine the regression line using the least squares method (9 marks)
- c) Interpret the regression coefficients (2 marks)
- d) Calculate the Pearson product moment correlation coefficient and comment on the strength of the relationship (2 marks)

[Total: 14 marks]

****END OF PAPER****