

Examiner's Report

AA1 EXAMINATION - JULY 2016

(AA12) QUANTITATIVE METHODS FOR BUSINESS

PART A

Question No. 01

This consisted of 8 Objective Test Questions, 3 short questions and 4 questions to state whether statements are True or False for a total of 40 marks. A few general weaknesses observed from the answers to sub parts of the question and are given below:

- 1.1 An equation to be solved through simple factors was given. But, a considerable number of candidates had not given the correct answer. The reason was not doing the factorization correctly.
- 1.2 This question relating to coefficient of determination was not answered successfully due to lack of knowledge of correlation coefficient.
- 1.3 This is a problem to find the probability using a tree diagram. Although the answer should be obtained by adding the probability of machine made and handmade defective quantities separately in order to ascertain the probability of defective quantity of the 2 mutually exclusive processes, only a very few candidates had done so.
- 1.4 This is a problem associated with application of differentiation. The profit function given in this question should be differentiated using 'q' and when the $\frac{dp}{dq} = 0$, it should be considered that the profit will be maximized. It was very clear that a large number of candidates had no idea about the differentiation.
- 1.5 This is a problem associated with regression analysis. Correct explanation on the equation of the given regression line had to be identified. However, a majority of the candidates had not understood the relationship between the two variables of the equation.
- 1.6 This is a problem relating to probability. The probability of a ball being red can be found out by finding out the probability of drawing a red ball from each bottle and totaling them, because those are mutually exclusive. A large number of candidates were unable to do that because they had not understood the theory behind probability properly.
- 1.7 It was necessary to identify the correct graph depicting the given revenue function and cost function out of the graphs given. It was evident from the answers given that the knowledge of candidates on graphs was at a very low level.
- 1.8 It was necessary to find the price index (price relative) of 2015, based on the prices of a kg of a sugar for 2010 and 2015 given in the table, considering 2010 as the base year. A majority of candidates had not answered satisfactorily because of lack of knowledge of the relevant formula. However, this formula has been provided with the question paper.

- 1.9** It was necessary to calculate the break-even units with the given cost and revenue functions. A considerable number of candidates had failed to find the value of x , considering the fact that the two equations, namely TC and TR are equal at the break-even point.
- 1.10** A simple problem in which the selling price had to be calculated when the cost of manufacturer and profit margin were given. Most candidates failed to calculate the profit. Even those calculated the profit correctly had not shown the selling price in some instances.
- 1.11** This was a question on sampling. Reasons for obtaining a sample had to be given. Most of the candidates could not correctly state the reasons for obtaining samples. The reason for this is the lack of interest of candidates to understand theoretical aspects of a subject matter.
- 1.12 to 1.15** These 4 questions were based on the Investment Appraisals. Options to be evaluated based on cash flows, present values and net present values to state whether the statements given are True or False. Majority of the candidates without understanding those statements correctly had written incorrect answers.

PART B

This section consisted of 4 compulsory questions.

Question No. 02

This question consisted of 2 parts. Total marks allocated were 10.

- (a)** $R(x) = 24x - 2x^2$ was given as the Revenue function and $C(x) = 40 + 4x$ was given as the Cost function. It should be known when answering part (i) that $R(x)$ and $C(x)$ have to be derived to obtain the profit function. Therefore, the number of units at which the profit is maximized for part (ii) could be obtained by differentiating profit function $P(x)$ by x . The maximum profit for part (iii) could be found by substituting the number of units which maximizes the profit to the profit function.

Here, a large number of candidates could not derive the profit function and also had no idea about differentiation. The rules related to differentiating a function should be studied thoroughly by candidates.

- (b)** This part required calculation of Laspeyre's Price Index / based weighted Price Index. Most candidates had not identified the formula for Laspeyre's Price Index, although it was given in the formula sheets of the question paper.

Question No. 03

Although this was a simple problem, majority of the candidates had not answered it satisfactorily.

- (a)** Drawing a histogram to represent the data of the distribution was expected. The weaknesses of candidates included not naming the axis, not showing correctly the frequencies, keeping space in between adjoining columns of the histogram, etc. some candidates had drawn bar charts instead of the histogram.

- (b) In this part it was expected to solve the given 2 simultaneous equations. Though it was a simple mathematical question, majority of the candidates had not answered correctly. In solving an equation out of the 2 variables one variable should be excluded first and the simple equation that remains should then be solved. That method had not been followed by considerable number of candidates.

Question No. 04

- (a) In this part the expected number of errors had to be calculated out of the probabilities given in the table. Majority of the candidates could not identify the relevant formula to calculate the expected value. Although the variance of x had to be calculated next, majority had failed to apply the formula correctly and arrive at the answer.
- (b) In this part identification of Marginal Revenue Function & Marginal Cost Function from the given Total Revenue Function and Total Cost Function are expected. Majority of the candidates had not used calculus to arrive at the answers. Their understanding of the MR and MC functions was at a very low level.

Question No. 05

A considerable number of candidates answered this question satisfactorily and part (a) was answered very satisfactorily by all.

However, answers to part (b) was at a poor level. Reasons for that are:

- Though most of the candidates had a very good understanding of NPV, they were not correctly done the NPV calculation.

Eg:- Though NPV had to be calculated for year 2, 4, 6, 8 only, it had been calculated for all the years from 1 - 8.

- A considerable number of candidates making errors in simplifications.
- Simplification have been done in total figures such as $\frac{110}{(1.08)^1} + \frac{110}{(1.08)^2}$.

There were candidates who provided answers to part (a) correctly and logically. As well a few candidates had to forgo the marks for part (c) because of errors made in part (b). There were also candidates who earned marks for part (c) without answering part (b).

PART C

Question No. 06

Part (A)

As a whole, only few candidates attempted this question. Majority of candidates had not been able to prepare the table correctly due to lack of basic knowledge and training relating to this question. Out of those who attempted, most candidates had correctly prepared the table according to quarters.

Although they had arrived at values and totals correctly they had not calculated correctly the median. Some had arrived at the median, dividing by 4 instead of by 3.

Only a handful of candidates were able to compute the seasonal indices correctly, because a large number of candidates could not correctly arrive at the adjusted values.

Eg:- Because of using value of totals instead of total of median values to calculate adjusted values, as

$$\frac{0.22}{4} = 0.054 = 0.06$$

Part (B)

A few weaknesses observed generally from the answers given are shown below:

- (1) A few candidates had not been able to select the correct formulae, even though those had been given with the question paper.
- (2) There were candidates who used $\frac{\sum fx}{\sum f}$ for median instead of $= \frac{\sum fx}{\sum x}$.
- (3) It was seen that the use of Σ was at a very weak level by a considerable number of candidates.
Eg:- use of $\Sigma(fx)^2$ instead of Σfx .
- (4) Some had not been able to select the mid value correctly.
Eg:- It was found that sequence of 115, 125, 135, etc. had been taken instead of the sequence of 114.5, 124.5, Etc. It was also found that instead of 114.5 , 164.5 , etc. had been used in an incorrect order.
- (5) Using $\Sigma (x - x)^2$ instead of $\Sigma f (x - x)^2$.
- (6) Substituting $\Sigma f \Sigma x$ instead of Σfx^2 .
- (7) There were candidates who wrote $145.0 \times 0 = 145$.
- (8) The level of understanding and the use of symbol Σ was at a low level.

Part (C)

There was a majority of candidates who copied the formula for correlation coefficient correctly, but could not substitute properly. A few weaknesses observed from the answers given are shown below:

- (1) There were instances where instead of $(\Sigma x)^2$, $(\Sigma y)^2$ or Σx^2 had been substituted.
- (2) It was observed that the correct value for 'n' was not substituted, as well as incorrect values had been substituted for 'n'.
Eg:- 12, 15 , etc.

- (3) Majority of the candidates had forgotten to indicate the symbol for “square root” when writing down the expression for r. Some candidates when substituting values to the formula correctly and working out simplifications had arrived at ,

$$r = \frac{21}{676} = 0.031 \quad \text{as the final answer instead of} \quad r = \frac{21}{26} = 0.8$$

because of forgetting the square root symbol in the simplification process.

- (4) There were many candidates who did not know simple simplifications.

Eg: To find out the square root of $\sqrt{26 \times 26}$ some candidates have multiplied the two values and find out the square root.

General matters for which attention should be drawn to improve performance level of candidates:

1. Studying well the full content of the new syllabus completely paying more attention to newly introduced subject matters.
2. Workings should be clearly shown along with answers wherever applicable.
3. Naming of graphs properly and explaining clearly as well as copying and application of formulae should be done with utmost care.
4. Handwriting should be legible and the numbers of questions should be correctly written.
5. Following correctly the instructions given in the question paper.
6. Perusal of past question papers and suggested answers would help sharpening of knowledge and experience.
7. Proper management of time is important.
8. Re-checking of question numbers etc. before handing over answer scripts is a must.
9. Appearing for the examination with a firm determination of passing the examination with due preparation.

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