

Examiner's Report

AA1 EXAMINATION - JANUARY 2018

(AA12) QUANTITATIVE METHODS FOR BUSINESS

PART A

Question No. 01

General Matters:

- Candidates had not taken action to pay attention to read the questions and the instructions regarding answering carefully. It was proved by their writing the full answers instead of the relevant numbers, and in certain instances by writing Roman figures not given in the question at all in place of the numbers given, in the case of question Nos. **1.1** to **1.10**.
- Some candidates had provided answers to only a few parts instead of answering all the 15 parts of the question. The chances of obtaining full marks were lost by leaving blank spaces.
- Candidates in certain instances had cut off the first answer, the second answer and the third answer but had failed to provide other answers thereby foregoing marks as a result.
- Generally, due to lack of theoretical knowledge of candidates on simplification of equations, probability, compound interest, indices, standard deviation and normal distribution and their inability to arrive at the answers solving the problems correctly, incorrect answers seem to have been provided.
- The attention of candidates did not seem to have been received to the fact that 40% of the marks of the question paper had been allocated to this question, that in order to pass the subject a large percentage of marks could have been obtained from this question and that the possibility of providing correct answers to a large number of parts during a short period of time, though short calculations was available to them. Candidates are therefore advised to devote around 01 hour to **Section A** out of the 3 hours given for the paper, paying special attention to answer question No. 01.

This OTQ consisted of 10 multiple choice questions and 5 short questions with a 40 marks allocation a few general weaknesses observed from the answers provided to sub-questions of question 01 are set out below:

- 1.1** It was expected to arrive at the value of “y” by simplifying a simple equation. An easy simple question. Majority of the candidates had answered correctly. Some candidates had written “b” as the answer, instead of the number relevant to the correct answer.
- 1.2** A question relevant to calculation of compound interest. A considerable number of candidates had answered satisfactorily. Some candidates had arrived at the answers using calculators, but due to errors in calculating had not reached correct answers. Other answers had been given instead of compound interest. Candidates should have previous experience having solved problems, in order to select the correct formula provided in the paper. Some candidates had attempted to add interest from year to year for the 2 years to get at compound interest instead of using the compound interest formula, and had committed errors in the process.
- 1.3** In this, the relationship between total cost, fixed cost and variable cost, under financial maths had been tested. Most of the candidates had provided correct answers. Those who did not provide correct answers had not correctly identified the relevant relationship of the question, namely, Fixed Cost + Variable Cost = Total Cost. The main reason for this would have been not understanding the correct meaning of these concepts.
- 1.4** The relationship between variance and standard deviation, which is its square root, relevant to statistics has been tested by this question. The knowledge of a relationship which candidates should compulsorily have known has been tested by this very simple question. There were candidates who had not provided answers correctly to such simple question. Candidates should know that standard deviation is the square root of variance
- 1.5** Knowledge about normal distribution has been tested by this question. Only a handful of candidates only had written correct answers. The knowledge of most of the candidates on this very important distribution was found to be minimal. The shape of the normal distribution is an important matter that should be known by candidates.
- 1.6** The breakeven quantity based on information relating to a garment factory had to be calculated. In that, the breakeven point is the point where total revenue equals total cost forming a simple equation $TR = TC$. The value of x has to be obtained simplifying the given equation incorrectly. It was clear that the knowledge of candidates to simplify simple equations was at a low level.

- 1.7** A problem relating to Index Numbers. Although 2014 was to be considered as the base year, some candidates had taken it as 2016. Also, some candidates had not correctly selected the correct Price Index Formula from the given formula sheets. Taken as a whole, only about half the number of candidates had provided correct answers.
- 1.8** Out of the 10 OTQs this was the question to which the least number of candidates had provided correct answers. It was required to calculate the approximate present value of the annuity belonging to financial maths by selecting the correct formula. Most candidates had not understood the correct thing to be done.
- 1.9** The mean of a simple data distribution had been tested. A very simple question. A large number of candidates had provided satisfactory answers
- 1.10** The standard deviation of a simple data distribution had been tested. Many candidates had arrived at the mean correctly and thereafter calculated the variance and taken that as the standard deviation. Then having noted 4.67 as the first answer given, they have taken that as the correct answer. More than half the number of candidates had provided the correct answers.

Relating to questions **1.11** to **1.15** a data table had been provided and 5 probabilities based on that had been tested. Matters relating to interpretation of probability, usages and total probability measurement, non-probabilities were tested. A significant number of candidates had no correct understanding of probability. Some candidates had no knowledge that probability takes the value 0.0 – 1.0 in figures. Some of them had given values above 1 for probability.

- 1.11** A large number had provided answers to this question through methods such as Tree diagrams using the table. Overall, majority of the candidates had answered correctly. As per interpretation of probability of the number of positive results divided ($\frac{n}{N}$) through the use of random samples answers could be arrived at easily.
- 1.12** A large number of candidates had answered this question. Tree diagrams had been used for interpretation. A majority of the candidates had provided correct answers.
- 1.13** About half the number out of the whole number of candidates had answered correctly.
- 1.14** This tests knowledge about conditional probability. Due to lack of knowledge on that aspect a considerable number had not written correct answers.
- 1.15** This has tested on total probability. Some candidates although correctly found probability in each category, had not added on their total probability. Some candidates had made mistakes in adding-up.

PART B

This section consisted of 4 compulsory questions.

Question No. 02

This question consisted of 2 parts. Total 10 marks had been allocated. It was required to identify the Total Revenue Function and the Profit Function on the basis of the given functions and to calculate the quantity to maximize the profits. On an overall a majority of the candidates had provided satisfactory answers.

- (a) It was necessary to identify the Total Revenue Function when the Demand Function $D_{(x)}$ was given. Because of the error of not using the brackets correctly when multiplying $D_{(x)} \times x$ instead of $(D_{(x)}) \times x = (66 - x) \times x$, $66 - x \times x$ had been used.
- (b) A majority of candidates had written satisfactory answers. Some candidates had incorrectly deducted Revenue Function from the Cost Function to arrive at the Profit Function. There were instances of committing errors in simplification.
- (c) Although arriving at the maximized value of x should have been obtained by differential calculus correctly after obtaining the Profit Function and equating the differential coefficient to zero, some candidates had not correctly used calculus and equated to zero. Here some candidates had found out the Managerial Revenue and Marginal Cost, equate those and calculate the maximized profit. Candidates should realize that the correct answer can be arrived at by following any of these methods.

Question No. 03

Part (a) of this question required calculation of the base weighted aggregate price index (Laspeyre's Price Index) for the year 2017 and part (b) the current weighted aggregate price index (Paasche's Price Index) for 2017. A considerable number of candidates had provided the correct answers. Why some candidates had been unsuccessful was because of not taking $P_1q_1, P_1q_0, P_0q_1, P_0q_0$ and not arriving at $\sum P_0q_1, \sum P_1q_0, \sum P_1q_1, \sum P_0q_0$ columns of the table. Some candidates had made mistakes in multiplication and division. Some candidates had mistaken the base year while others had not selected the correct price index. Candidates are expected to face this type of examination with previous preparedness relating to price and quantity indices.

Question No. 04

- (a) It was required to draw a scatter diagram to represent the data given. A handful out of all the candidates had written the axes in the scatter diagram changed. Some candidates had not correctly proportioned the two axes and certain others had made mistakes in making the axes.
- (b) A majority of candidates had correctly calculated the correlation coefficient relating to this section. Some candidates had made mistakes in calculations. Some candidates had also failed to identify the correct formula from the given formula sheet.

- (c) Some candidates had not correctly identified the relationship according to the symbol and value of the correlation coefficient. There were also candidates who had given up answering this part of the question. Candidates should be capable of identifying the relationship depending on the calculation of the correlation coefficient.

Question No. 05

- (a) For this part, it was required to identify the regression line using the information given in the question. Instead of finding “a” and “b” coefficient, some candidates had drawn a graph using the information in the table. It appeared that the question had not been understood properly. Another error was not selecting correctly the formulae for coefficient “a” and “b” from the formula sheet. Some candidates had calculated coefficient b only and provided incomplete answers.
- (b) Calculation of Net Present Value (NPV) was required for this section. In finding the value, instead of taking first discounting factor for the year 0, another value had been taken. Some candidates had taken another discounting factor instead of the given 10% discounting factor. Some candidates had taken first year receipts as Rs.65,000/- and thereafter 2nd year receipts incorrectly as Rs.130,000/-.

PART C

Question No. 06

- (A) A question testing on the knowledge of Geometric Sequence. On the overall a majority of candidates had written satisfactory answers. Some had not understood its as a geometric sequence and had not correctly added the terms which was an error. More than half who arrived at correct answers had calculated the 5 days amounts separately and added together. If there were a larger number of terms, they would have to identify the correct series and then calculated. Some candidates who had correctly identified it as a geometric sequence, had written the value of the 5th term, instead of the total of the 5 terms. There were also those who had correctly substituted having identified the geometric sequence, but made errors in calculations.

There were those who wrote erroneously as $\frac{(2^5 - 1)}{2 - 1} = 2^4$, and calculated 2^5 erroneously as well as substituted $r = 30$ erroneously.

A handful of candidates had given wrong answers as an arithmetic sequence.

- (B) This relates to solution of simultaneous equations. A majority of candidates had provided satisfactory answers. Some candidates did not seem to have the basic knowledge in solving simultaneous equations. Instead of converting to a simple equation by removing one variable, they had messed up the question. Due to the lack of knowledge of the method of removing a variable, adding together continuously the two equations as well as obtaining repeatedly a number of equations, they had attempted to remove x or y . The reason for going wrong in the answers of those who get the 3rd equation correctly, was their lack of knowledge in the use of the minus (-) mark in the removal of brackets.

- (C) (a) A majority of whole candidates had not provided correct answers for this part. The main reason for this was not taking the interest rate for a quarter as $\left(\frac{0.12}{4}\right)$.

Also, they had not taken $n = 4 \times 5 = 20$. Instead of that they had substituted $n = 5$. Many errors in simplifications were also noted.

- (b) Only a handful of candidates had answered satisfactory this question. The main reason for this was not taking the monthly interest rate as $\left(\frac{0.132}{12}\right)$.

Also, many candidates have not correctly found the original investment by

$$x = \left(\frac{S}{(1+r)^n}\right) \text{ and also taken interest as } (500,000 - x).$$

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

1. Studying well the full contents 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. Care should be exercised in copying formulae and in substitution. Using of the most convenient formula when several formulae could be applied to answer certain questions.
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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