THE INSTITUTE OF CHARTERED ACCOUNTANTS OF PAKISTAN

EXAMINERS' COMMENTS

SUBJECT	SESSION
Quantitative Methods	Foundation Examination - Spring 2008

General:

Overall performance of the candidates was quite satisfactory but still, many students failed to achieve good marks. Apparently such candidates focused on remembering the formulas rather than understanding the concepts due to which they performed well in straight forward questions but performed poorly where they needed to understand the question and reshape the given data before applying the formula.

Question-wise comments are as under:

Q.1 (a) It was a simple question of determining values of two variables by solving the given equations simultaneously. This question can be solved easily by using substitution or elimination method. Most of the students did attempt it correctly. However, a good number of students got confused in the step involving cross-multiplication and ended up with incorrect answers.

(b) In this question students were required to find the equation of the straight line for the given points. The students attempted this question by applying a number of different methods but only a few were able to solve it completely. Some of them were unable even to correctly identify the two points (on the line) which were given in the question. They identified them as (8,4) and (4,8) instead of (8,0) and (0,4). Some of the students who correctly identified the points, were unable to calculate the slope of the line or thereafter use the slope to determine the equation of the line.

Q.2 (a) The question was designed to test the basic concepts of logarithmic applications. Majority of the students attempted this question successfully; however, some of them thought that $2\sqrt{5}$ was equal to $(5)^{1/2}$ and resultantly got to the wrong answer.

(b) This question required differentiation of equations involving logarithmic and exponential functions appearing under square root. Almost all students successfully differentiated the term but many of them got confused in the process of simplification and were unable to prove the given equation.

Q.3 (a) Majority of the students attempted this question of simple interest and compound interest correctly and got full marks. However, some students selected the correct formula but were unable to put the values correctly. According to the question, Rs. 600,000 was the amount required at the time of maturity i.e. it was the sum of the principal plus interest whereas the principal was to be computed. Instead, such students took the principal as Rs. 600,000 and computed the amount at maturity.

(b) The question was based on a situation where the present value of equal and recurring quarterly payments was to be found. Instead, many students calculated the future value of such payments. Some students who had clear understanding of the concept of present values and annuities attempted the question successfully. However, even such students got confused as they ignored the down payment while calculating the cash purchase price or later while determining the total interest.

Q.4 (a) The problem faced by most of the erring students was in the determination of profit function. They were required to determine the Total Cost function by multiplying the Average Cost Function by 'q' and then subtracting it from the Total Revenue function. Instead, they subtracted the Average Cost function from the Total Revenue function for arriving at the profit function.

Other common errors were as follows:

(i) Some of the students did not carry out the second derivative test.

(ii) The price at which profit will be maximized should have been determined by dividing the TR Function by the quantity 'q' and valuing the resultant equation at q=90 i.e. the quantity determined in sub-part (i). Many candidates could not perform this step correctly.

(b) Majority of the students could determine the corner points and were able to draw the graph correctly. However, many students could not identify the feasible region. The most common error was to ignore the conditions $x \geq 0$ and $y \geq 0$.

Q.5 Similar questions have frequently been examined in the previous examinations. As a result, the students were generally well prepared and attempted the question correctly. However, the answers contained a number of arithmetical errors. Moreover, some students ignored the instruction regarding Cramer's rule. They tried to solve the question through other methods and could not secure any marks.

Q.6 (a) (i) Very few students could identify the population i.e. all the students of the college.

(ii) A large number of students held the view that since the number of students in a college is **very large**, the population is infinite.

Many students identified the population as finite but didn't provide any reasons to back their decision.

(iii) In this case most of the students correctly identified the ages as a continuous variable and number of family members as discrete variable.

(b) Stem and leaf display was included in the syllabus only a few years back. Unlike the previous attempts, the students this time had prepared the topic in a better way and most of them were able to perform well. However, some students were confused about the "-" appearing in the second row. It represented the fact that there was no value in the forties i.e. from 40 to 49. Most of the students identified it as the value '4' and some as '40'.

(c) The candidates were required to work back the values of n and p whereas mean μ and standard deviation σ were given. The question was attempted well by majority of the students. However, some of them used the formula $\sigma = n .p .q$ instead of correct formula i.e. $\sigma^2 = n .p .q$.

Q.7 (a) The topic of linear relationship is usually covered in all the examinations but this time the way in which the question was designed was quiet different. In spite of the above, the performance was good which reflects a shift whereby it could be seen that a large number of students had in this case, understood the concepts rather than memorizing the formulas and procedures.

The confusion which was often witnessed was as regards the following:

- b_{yx} was calculated instead of b_{xy} and vice versa.
- Co-efficient of co-relation was computed using the formula $r = \sqrt{b_{yx} \times b_{xy}}$. The result apparently showed two values i.e. a positive and a negative value. Many students preferred to show both the values in their answers instead of clarifying that since b_{xy} and b_{yx} were both positive, the co-efficient of co-relation will be positive.

(b) The candidates' performance in this question was average as the following types of mistakes were common:

- Almost half of them were confused and applied the formulas without ranking the examination scores.

- Some of them did not know how to rank the scores which were equal.

Q.8 (a) This question was attempted well by majority of the students. However, a few candidates were confused and used the formula of variance to calculate standard deviation and then tried to compute the variance by squaring it. Moreover, some students computed $\sum(f.x)^2$ and used it as $\sum f.x^2$.

(b) Only a few candidates were able to achieve full marks in this question. Though most of them were able to calculate real per capita income correctly, they failed to apply the correct formula for determining the purchasing power of money. The formula is "100 ÷ Consumer Price Index."

Q.9 (a) The performance in this question was mixed and very few of the students could secure full marks. Majority of the students seemed to lack the conceptual understanding of the topic and relied on memorizing the formulas. Some of the points noted in the answer scripts are as under:

- The probability that both husband and wife will be selected were correctly calculated i.e. 0.029.
- A large majority of the students incorrectly calculated the probability that neither the husband nor the wife will be selected, by deducting the probability determined in (i) above from the value "1.0".
- The method of determining the probability that either the husband or the wife will be selected proved too difficult for most of the students.

(b) The question was extremely easy and those with a conceptual understanding could have arrived at the answer rather easily by taking $\left(\frac{1}{6}\right)^3 = 0.00463$. The students who used the Binomial theorem also secured full marks although the method was relatively lengthy. However, since the question seemed somewhat different from normal, the performance of most of the students was extremely poor.

Q.10 (a) Only a few students could apprehend the question correctly. The most common and a very basic mistake was that majority of the students tried to calculate two different confidence intervals i.e. in respect of blood pressure prior to and after taking the salt free diet. In fact they should have calculated the confidence interval for increase/decrease in the blood pressure.

Some of the students used z – statistics instead of " t ".

(b) Although most of the students did show good understanding of hypothesis testing, the following types of mistakes were commonly seen:

- Many students were unable to interpret the term "sum of squares of deviation of values from the mean". In symbolic form it meant " $\sum(x-\bar{x})^2$ ".
- Many candidates used the formula $t=\frac{\bar{x}-\mu}{s}$ instead of $t=\frac{\bar{x}-\mu}{s/\sqrt{n}}$.
- Some of the students used z – statistics instead of " t ".

(THE END)