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Examiners' Report

Summer 2014

Pearson Edexcel GCE in Statistics S2R (6684/01R)

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Mathematics Unit Statistics 2

Specification 6684/01R

General Introduction

On the whole this paper was well answered. Most questions on the paper seemed accessible to all students.

Generally the work was quite well presented. Often students knew the statistics needed to answer the questions but were let down by poor algebraic skills.

Report on Individual Questions

Question 1

This question was done well with the majority of students gaining at least 4 marks. A minority of students failed to give a correct contextual interpretation despite rejecting H_0. Occasionally hypotheses were incorrectly written and a few students attempted to use the Poisson distribution.

Question 2

Q02(a) was well done with a number of students justifying in some detail each answer they gave. A few students tried to ‘hedge their bets’ by writing ‘yes yes yes’ and ‘no no no’.

The majority of students answered Q02(b) correctly however Q02(c) proved to be more challenging. The most common error was that students thought that the first and third counter had the number 2 on rather than just the 3rd. The majority of students who interpreted the question correctly and then went on to gain the right answer found $\mathrm{P}(2' \; 2' \; 2)$. Those who tried listing the four probabilities usually only listed three.

Question 3

Q03(a) and Q03(b) were well answered although in Q03(a) a few students wrote down Poisson but forgot to give the value of λ.

Since Q03(c) is a ‘show that’ question students were required to write down all the steps needed to reach 0.777. Many students went straight from $1 - \mathrm{P}(Y = 0)$ to 0.7769. To gain full marks they were required to write down the figures between these two stages $(1 - 0.2231)$.

Most students identified the Binomial with $n = 6$ and $p = 0.777$ in Q03(d) but few could progress any further. Many who did try either omitted ${}^6\mathrm{C}_4$ or used $(0.777)^2(1 - 0.777)^4$

Question 4

Many students gained full marks in Q04(a). The most frequent error was to draw a straight line from $(1, 3k)$ to (0,0) rather than the horizontal line $y = 3k$. Others did not draw a curve but a series of short straight lines.

Q04(b) proved to be quite challenging with few students getting the mode = 2. Many students spent some time trying to work the answer out algebraically with different degrees of success. The question asked them to "Write down" which indicates that the answer should be able to be gained without any working. In this case the diagram in Q04(a) shows the mode.

The majority of students were able to use the mean and their mode to comment on the skewness in Q04(c)

In Q04(d) the most common error was to forget about the area for $0 \le x < 1$ or forget to equate the area to 1. Integration when attempted was often done correctly.

Q04(e) was well answered although a few students did copious calculations rather than realise the area for $0 \le x < 1$ was 0.25

Few students were able to make much progress with Q04(e). A minority of students recognised that $\mathrm{P}(1 < X < 2)$ was the same as $\mathrm{P}(2 < X < 3)$ and used this fact to gain the answer. The majority used integration to work out the unknown areas.

Question 5

This question was generally well answered by the majority of students. The most common errors were to forget to write down the hypotheses in Q05(a) and in Q05(c) the continuity correction was either not used or was incorrect.

Question 6

This question proved quite challenging to many students. In Q06(a) students managed to get the correct equation but were unable to solve it. Of those who were able to solve it successfully the most common method used was to substitute $x = d^2$ and thus produce a quadratic in x^2.

In Q06(b) many students found $\mathrm{f}(d)$ but then went on to equate this to 0 rather than using $\mathrm{f}'(d)$. The majority of students either forgot to justify their answer was the mode or they did not know that to justify their answer was the mode they needed to prove it was a maximum point

Question 7

Q07(a), (b), (c) and (e) were well answered with the majority of students gaining full marks. The most common error was to forget to give the range of values although a uniform distribution was identified.

Q07(d) proved to be more challenging with the majority of students making little progress. Those that did make an attempt managed to find the correct value for $\mathrm{E}\left(X\right)$ but only a very small number found $\mathrm{Var}\left(X\right)$ correctly. Few students recognised that they then needed to use the formula $\mathrm{E}\left(X^2\right) = \mathrm{Var}\left(X\right) + \left[\mathrm{E}\left(X\right)\right]^2$. The most common error was to use $\mathrm{E}\left(\mathrm{R}\right) =$

$\mathrm{E(R)} = \int_0^9 x(9x - x^2)\,\mathrm{d}x$

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

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