Principal Examiner Feedback

Summer 2018

Pearson Edexcel GCE Mathematics
In Statistics S4 (6686) Paper 01

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Summer 2018
Publications Code 6686_01_1806_ER

Introduction

Students found this paper accessible and were able to make a reasonable attempt at the majority of questions with some excellent scripts submitted. The presentation of the work was generally good and students were able to complete the paper within the time.

Report on individual questions

Question 1

The question proved to be a friendly starter for the majority, with many students gaining full marks. The most common error was not using any context or not enough context in the final statement.

Question 2

Part (a) of this question proved very accessible to the majority of students with many gaining full marks. The most common errors were made in (ii) where students used the incorrect chi squared values or forgot to square root to find the interval for σ rather than σ^2.
Part (b) proved more difficult particularly for the weaker students. Whilst many students gained the first B mark for 45.6, 1.26 or 26% few then went on to say what this meant and simply stated it was not in the confidence interval. A minority of students did not give a full explanation and just commented on the standard deviation when the question specifically said to use both parts (a) and (b) to explain.

Question 3

It is pleasing to see that the majority of students now realise that it is the differences which are normally distributed in part (a).
Part (b) was a good discriminator. The majority of students were able to gain some marks but only the most able found the two ranges. The most common error was to use just the positive critical values which gave one range.

Question 4

The most able students were able to answer this question with ease. The slightly weaker students made a good start and were generally able to do parts (a) and (b). Weaker students sometimes got confused over the hypotheses, writing H_0: $\mu_G = \mu_T$ and H_1: $\mu_G > \mu_T + 4$, and consequently muddled the conclusion demonstrating a misunderstanding of what they were testing. Others forgot to take account of the 4 in their test statistic.
In part(c) the stronger students were able to gain the 2 marks with ease. Weaker students tried to use the 4.55 and gained no marks.
In part (d) a minority of students made no comment on the standard deviation. Whilst the majority of students were able to show that $\bar{X}_G - \bar{X}_T = 4.35$ the final mark was often lost as they stated that "they should use *Tackfast*" but made no comment that indicated how it would affect the decision.

Question 5

Part (a) was well answer but part (b) proved to be a good discriminator. The most common approach was to start with $\frac{150-152}{\frac{4}{\sqrt{n}}} = z$ value which they then tried to solve for *n*. Of those students who realised they needed to form 2 equations the majority went on to provide a correct solution.

Question 6

The majority of students were able to make some progress with this question. Part (a) was well attempted and many full marks were seen. However, some students made slips and chose to fudge their answer rather than just checking back to find the error. Fully correct working was requires and any incorrect working was penalised.
In part (b) the question started with Hence and not Hence or otherwise so the students were expected to use part(a) to find both E(*X*) and Var(*X*). Part(c) was a good source of marks for those who remembered the *n*. The majority of students who attempted part (d) were able to gain at least the first 3 marks. The main error, for those who tried to differentiate to find the minimum was to differentiate with respect to θ rather than *a* or *b*.
Parts (e) and (f) were only attempted by those who had gained values for *a* and *b* in part (d). Part (e) should have been a red alert for students who had made a mistake in finding the values of *a* or *b*. However there was very little evidence of students realising their mistake. They simply used the values they got and wrote $\text{Var}(S_2) = \frac{\theta^2}{11}$. It is worth reminding students they should always check their working gives the required answer and not just assume it does.

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom