GCE EXAMINERS' REPORTS

GCE (LEGACY)
MATHEMATICS C1-C4 & FP1-FP3
AS/Advanced

SUMMER 2019

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MATHEMATICS

General Certificate of Education (Legacy)

Summer 2019

Advanced Subsidiary/Advanced

C1

General Comments

This year's paper seemed to be of a similar level of difficulty to most of the C1 papers of recent years. There were only 24 entrants, many of whom were able to earn high marks. The questions which were least well answered were 4, 5(*b*) and 9(*b*). In question 1(*b*)(ii), several candidates were unable to identify which was the right angle in triangle *BCD*. This usually arose as a consequence of not having drawn a clear diagram.

MATHEMATICS

General Certificate of Education (Legacy)

Summer 2019

Advanced Subsidiary/Advanced

C2

General Comments

Candidates seemed to find this to be a difficult paper even though, with one exception (part 7(*b*)), questions of a similar nature had been set in recent years. There were 32 entrants with a mean mark of 47·5. The questions which caused most problems are noted below.

Comments on individual questions/sections

Q.3 Part (*a*)(i) was universally well answered, but then only a minority realised that the hint given in the question implied that $\cos ADB + \cos ADC = 0$. In part (*b*), several candidates used their calculators to calculate a value for angle *ABD* and consequently lost marks for an inaccurate answer.

Q.4 (*a*) Some of the attempts at finding an expression for the sum of the given arithmetic series were, at best, patchy.

Q.5 (*a*) This part was very poorly answered. Many candidates complicated matters by unnecessarily introducing a first term a rather than by simply observing that the ($p+3$) th term = p th term $\times$ r^3.

Q.7 (*b*) Not all candidates appreciated that $\log_{10}(100x) = \log_{10}(100) + \log_{10}(x)$ and, of those who did, only a small minority were then able to proceed to the correct answer.

Q.8 (*b*) There were several examples here of candidates drawing very poor diagrams (or no diagram at all) and consequently choosing the incorrect sides when trying to find $\tan QPR$.

Q.9 Part (*b*) was on the whole disappointing. The most popular correct method involved noting that *DC* – *CB* = 19, whereas *DC* + *CB* = 13π (semi-circular arc).

MATHEMATICS

General Certificate of Education (Legacy)

Summer 2019

Advanced Subsidiary/Advanced

C3

General Comments

This seemed to be a fairly straightforward paper. The mean mark of 48 was slightly lower than what has been the case in recent years and was, as such, a little disappointing. Overall, candidates found the paper to be accessible, although question 4 seemed to throw up some unexpected problems. The other questions which were not well answered are noted below.

Comments on individual questions/sections

Q.1 In part (*b*), many candidates did not realise they had to integrate the '1'.

Q.3 It was only part (*b*)(ii) which caused any real problems and many candidates failed to earn any of the last three marks. Hardly anybody was able to give a correct reason as to why $\frac{\mathrm{d}y}{\mathrm{d}x}$ could not be – 2.

Q.4 This turned out to be a poorly answered question. In part (*a*), many candidates were unable to derive the given expression for x. Some of the methods used in part (*b*) to prove that x_4 was in fact the value of x correct to two decimal places often only involved $\frac{1400x - 19200}{x}$ and as such, were not valid.

Q.5 In part (*d*), many candidates were unable to simplify their expression for $\frac{\mathrm{d}y}{\mathrm{d}x}$ and consequently lost the final two marks.

Q.7 Whereas part (*a*) was generally well answered, many candidates were unable to obtain full marks in parts (*b*) and (*c*).

Q.8 In part (*c*)(ii), it was disappointing to note that some candidates did not seem to realise that the fact that $f^{-1}(0.5) = \frac{1}{13}$ implied that $f\left(\frac{1}{13}\right)$ must = 0·5.

MATHEMATICS

General Certificate of Education (Legacy)

Summer 2019

Advanced Subsidiary/Advanced

C4

General Comments

Performance on this year's C4 paper was rather disappointing, the mean mark being 42·1. The questions which caused most problems were 2(*b*), 9 and 10, but there were numerous examples of poor algebraic manipulation to be found in candidates' solutions throughout the paper.

Comments on individual questions/sections

Q.1 This question was well answered, but not all candidates knew what was required in order to show that $f(x)$ had a stationary value when $x=1$.

Q.2 Almost all candidates were able to earn the first three marks, but only a small number were then able to make any further progress in this question.

Q.3 In part (*b*)(i) some candidates did not expand $R\cos(\phi-\alpha)$, but tried to write down, without explanation, an expression for $\tan\alpha$ which was not always correct. Not all were then able to find the correct least value for k in part (*b*)(iii).

Q.4 Most of the errors made here arose as a result of poor arithmetic substitution or poor algebraic manipulation.

Q.5 Only a minority of candidates were able to earn full marks on this question. Some either used the double angle formula incorrectly, or they did not use it at all, while others made algebraic errors of manipulation.

Q.6 This question was generally well answered, but not all candidates understood the significance of P having parameter 2 in part (*b*)(i).

Q.7 Part (*a*) caused few problems, but in part (*b*), some candidates ended up with u^4 as part of the numerator rather than the denominator.

Q.8 Not all candidates were able to deal with the algebraic manipulation required in part (*b*).

Q.9 In part (*b*), many candidates did not know how to go about finding the position vector of *C*, whilst in part (*c*)(i), others did not realise that their derived value for λ had to satisfy all three of their equations.

Q.10 The majority of candidates did not square both sides of the given inequality correctly and consequently were unable to make any further progress in the question.

MATHEMATICS

General Certificate of Education (Legacy)

Summer 2019

Advanced Subsidiary/Advanced

FP1

General Comments

This paper was taken by 4 candidates. As these were resit candidates, it was surprising to find that the scripts were better than expected. The paper was believed to be comparable with last year's paper, possibly marginally more difficult. The questions which were expected to discriminate are listed below. In the event, solutions were better than expected.

Comments on individual questions/sections

Q.6 (c) Candidates are not used to carrying out algebraic operations on matrices and this was not well answered.

Q.7 (c) This may be the first paper in which candidates were required to integrate a^x as opposed to differentiating a^x. One follows directly from the other of course, but it is quite a large leap at this level.

Q.8 The presence of the term $(-1)^n$ made this a more difficult induction problem.

MATHEMATICS

General Certificate of Education (Legacy)

Summer 2019

Advanced Subsidiary/Advanced

FP2

General Comments

This paper was taken by 6 candidates and again the scripts were better than expected. The paper is believed to be comparable with last year's paper.

Comments on individual questions/sections

Questions which caused a certain amount of head scratching were as follows.

Q.5 Questions involving hyperbolae are comparatively rare and some candidates were not comfortable with this question.

Q.6 Some of the candidates never understood what this question was about.

Q.7 Parts of this question were not well answered, particularly part (*b*) where the omission of modulus signs in $\ln(x-3)$ caused problems.

MATHEMATICS

General Certificate of Education (Legacy)

Summer 2019

Advanced Subsidiary/Advanced

FP3

General Comments

This paper was taken by 8 candidates and again the scripts were generally better than expected although 2 scripts were poor. The paper is believed to be more difficult at the top end compared with last year's paper. It is perhaps worth noting that 6 candidates took both FP2 and FP3 and the FP3 mark was, on average, 7 less than the FP2 mark.

Comments on individual questions/sections

Questions which caused this extra difficulty were as follows.

Q.5 As allowed by the syllabus, the appropriate substitution was not given which meant that some candidates were unable to make any progress.

Q.6 Some of the candidates found the reduction formula difficult to prove although some re-entered the question in part (*b*).

Q.8 Candidates had not seen anything quite like this before and found part (*a*) difficult although, as with Question 6, some re-entered the question in part (*b*).

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