GCSE

Applications of Mathematics (Pilot)

General Certificate of Secondary Education **J925**

OCR Report to Centres June 2015

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This report on the examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the examination.

OCR will not enter into any discussion or correspondence in connection with this report.

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General Comments

The overall level of attainment was marginally higher than in some previous sessions. There was a pleasing spread of marks with very few single-digit totals; less than 10% of candidates gained less than a quarter of the available credit but almost 60% gained at least half of the available credit.

There appeared to be a better than usual match between attainment and entry as evidenced by the comparative lack of very low facility questions coupled with a noticeable decrease in the number of questions not attempted compared with previous sessions. However, as might be expected, some of the more un-structured questions were found challenging, particularly by the least capable. Nevertheless at a purely subjective level an increasing number of candidates seem prepared to attempt such questions. Candidates are, for example, trying to structure their solutions by making use of sub-headings but this practice is less than widespread over centres and capability levels. Some centres advise candidates to highlight key numbers, which tends to help structure candidates' working and thoughts.

There was no obvious indication that time was a problem for candidates. The literacy demands of the paper did not appear to have a significant effect on their ability to respond to questions. The legibility of number and written work was at least satisfactory. Presentation and clarity of number work was generally of a good standard although there were instances of scant or confused working. This was particularly apparent in Question 3 part (a) where a small but significant proportion of candidates presented two numbers as their sole response or merely stated the shape they considered to be the most compact with no supporting evidence. Similarly there were instances of less than coherent solutions to Question 2 part (b).

Areas which were found difficult included: solving multi-step problems in context (Question 1(e)); identifying congruent shapes (Question 2(e)); using equations in context (Question 1(l)); estimating quantities (Questions 1(h) and (e)); and writing algebraic expressions (Question 1(j) and Question 3(c)).

Areas in which candidates showed a good understanding included: writing numbers to a specified accuracy (Question 2(a)(i)); performing simple arithmetical calculations in context (Question 2(a)(ii)); interpreting information displayed in tabular form (Question 1(c)); expressing quantities as fractions and finding fractions of quantities (Question 1(a) and1(d)(i)); and identifying reflection and rotation symmetry (Question 2(c)).

Comments on Individual Questions

1 In part (a) the large majority gained full credit with the least capable gaining at least half the available credit. Common incorrect responses included ‘5’ and attempts to write 4 billion in digits but missing some zeros. Partial credit was available in the latter case.

With part (b), although only a small minority gained full credit, the great majority gained partial credit. Using the formula was not usually a problem, although a number misread the number of zeros involved. Misunderstandings became apparent when candidates were asked to give their answers to the nearest penny, with ‘£1.40’ a very popular incorrect answer.

Part (c) was very well answered, with a very large majority of the least capable gaining full credit. It was one of the best-answered items. The most noticeable wrong response was ‘£57.25’ – probably originating in misreading 60p as £60 (£60 – £ 2.75 = £57.25). Partial credit was available for indicating the cheapest or most expensive CPM clearly; however very few candidates availed themselves of this.

The part question (d)(i) attracted full credit in just over three quarters of all candidates. There was no obvious root to the wrong responses, which included 19/20, 1/19, 1/5 and 1/10. Some attempted to use information from previous parts of the question. The most common response to part (ii) was to write the answer as a decimal ‘0.05’ or to respond with (1/20) = ‘0.2’, thus showing problems with interpreting fractions as percentages. Nevertheless the majority was successful.

Part (e) was found too challenging for most candidates, with over 1 in 10 failing to attempt the question. It was one of the items that attracted the least credit. Only about 1 in 20 gained full credit and a quarter failed to gain any credit. Responses showed poor metric conversions, misinterpretation of the question (many assumed 96 sheets weighing 120g each) and lack of logical organisation in calculations. A rather disappointing proportion had no knowledge as to what constituted a heavy or light load. There were instances of 120g being explicitly stated as being too heavy or 12000kg as being easy to carry.

1 (cont) Although part (f) involved relatively standard 'estimation of length using a known length', candidates had difficulty with it. Some of these problems may have been the result of there being a double answer line – one for the number and one for the units. This was a response to previous questions supplemented by the command to "put the units of the answer" to which some merely added the word "units". Credit could be gained by showing the correct unit and a wider tolerance range for the number than that required to gain full credit. Unfortunately a third of all candidates failed to gain any credit. A small but noticeable number gave correct answers but in the appropriate imperial units – these gained full credit.

Many candidates' insecurity dealing with powers of ten and of the rules of indices were evident in part (g). Partial credit was obtainable wherever feasible. This resulted in the majority gaining half or more of the available credit. A notable number of candidates just added zeros to the indices with no obvious logic. The last calculation involving dividing by 106 was too great a challenge for the majority.

In part (h) most candidates tacitly assumed that a single vehicle equated to a single viewing. However this only attracted minimal penalisation if their working was coherent and correct. Most were able to gain some credit but only one in ten were completely successful.

Part (i) was answered correctly and confidently by almost two thirds of all candidates. Nevertheless some were unable to measure the heights of the given letters with sufficient accuracy (the usual ± 2 mm was the standard adopted in marking). However it was pleasing to note that the majority appreciated how to use the actual formula.

About 1 in 5 candidates did not attempt part (j). (Communicating via algebraic notation is felt to be of equal importance as more usual literal communication.) Only a small majority gained any credit, with just over a third gaining full credit. Some used the numbers from the previous part and did not make a formula while others did not indicate what their symbols represented.

A large majority of candidates were successful with (k) part (i), however there were noticeable instances of poor reading of values from the graph. (The usual standard ± 0.5 of a small division was the accuracy required.) A significant proportion of candidates failed to realise that the answer to part (k)(ii) was double that of part (k)(i) – a follow-through was available for this. The majority of candidates gained full credit.

Part (l) was found challenging with just over a third of candidates failing to gain any credit. The majority of candidates gained some credit for reading off the distance travelled at 30 mph from the chart. Substitution of this distance leading to a multiplication instead of division was not uncommon. There was a noticeable number instances of trial and improvement used rather than simply transforming the given formula. This attracted full credit when the stated answer was within the appropriate range.

2 Part (a)(i) was correctly answered by a very large majority, which made it one of the best responded to items. A large majority of the less capable gained full credit. Part (ii) was also very well answered, with very few failing to gain full credit. Follow-through credit was available from part (i)(i) of which a number of candidates failed to avail themselves. Common wrong responses were 60, 1960 and 2010.

Part (a)(iii) was moderately well answered but not as well as might have been expected. Roughly half gained at least half the available credit but with a very small minority getting no credit. It was surprising to note the number, albeit small, that worked out angle C to be 180° or 60°. A number of candidates quite obviously measured the angles. Lack of knowledge of angles, even the size of a right angle and the angles formed by parallel lines was obvious.

A variety of approaches were used to solve part (a)(iv) but poor measuring skill with a protractor was all too obvious. Over a third failed to gain any credit but a slightly greater proportion gained full credit. Partial credit was available for clear evidence of a correct method such as subtracting an incorrectly measured acute angle from 360°.

Part (b) was one of the least well-answered questions on the paper, with just over half the candidates failing to gain even partial credit. It was a multi-step question that required a clear strategy. Poor or no calculation of the exchange rate hampered candidates' progress with the question. More attention given to monetary units might have helped. There were problems in some cases dealing with the moderately large numbers involved in some of the calculations.

Part (c) was quite well done by the majority of candidates. Using double symmetry properties may have led to some confusion. Success appeared to be almost independent of capability for this item.

A large majority gained some credit in part (d), but it was apparent that most candidates attempted to locate the centres of the circles by-eye. There was little evidence of the use of a ruler or measurements.

In part (e) a common error was to indicate just T or U. Another error was to include P as well as T and U. Overall, this was one of the most poorly answered questions. Congruence is a difficult concept for Foundation candidates.

3 Part (a) was well answered. Confusion between square root and square of the area were the main sources of error. Counting the squares around the shapes for the perimeter, resulting in 12 and 14, was also apparent, as was the reversal of the division. Wrong conclusions following correct calculations were relatively seldom seen. There was follow-through for the conclusion. A large majority of less capable candidates found this question difficult.

Overall part (b), a demanding question, was moderately well answered; however about a third gained no credit. Partial credit was available for the correct value of the numerator or denominator clearly seen in the working. A common wrong response was '3.794 ...', which resulted from performing the calculation as $0.5 \times \sqrt{3} + 1 + \sqrt{5}$.

Part (c) was found very challenging and it was also one of the most frequently omitted answers. The majority failed to gain any credit. Confusion over square and square root was again apparent, as was using addition instead of product in the formula denominator.

A381/02 Higher Tier

General Comments:

There was no evidence to suggest that candidates had insufficient time to complete the paper. Only a small number of candidates did not demonstrate the knowledge and skills required for the demand of a higher tier specification.

Use of calculators was evident throughout, but candidates need to be aware of the need to show in their answer the calculations they are performing on the calculator. This was particularly important in Q.1, Q.2(b), Q.3(b), Q.3(d)(ii), Q.3(e)(i) and Q.3(e)(ii). Method marks cannot be gained for a final answer that is incorrect where the calculation is not written down.

Additionally, it is difficult for examiners to follow calculations presented in a haphazard fashion. Methodical working, clearly set out, adds to the demonstration of candidates' mathematical knowledge and understanding and allows candidates to gain valuable marks where they have not managed to reach a fully correct solution.

Finally candidates should consider whether or not both their final answers and / or steps in the working are sensible with respect to the context of the question, see particularly Q.4(a)(ii), Q.5(c) and Q.6(c).

Answers where questions required mathematical justification could be improved. Clarity of explanation was often poor and sometimes ambiguous. Too often responses to these types of questions resembled a scatter gun approach quoting everything they knew, see particularly Q.4(b) where many angle facts were given, but not linked to an angle found.

Comments on Individual Questions:

Question No.1

Most candidates who gained full marks did so with an exact answer of £412 500 (although some did round answers mid-way and obtained an acceptably accurate answer).

A significant proportion gained at most two marks usually by finding 10% of 1000000 and then equating it with 66000, but then seemed unclear about how to use this conversion factor.

£412 500

Question No. 2

Responses to Q.2(a) showed that most candidates were able to successfully read from the graph and correctly evaluate their reading using the formula. A few candidates multiplied instead of dividing by three, and a handful misread the graph scales or tried (incorrectly) to convert their answer from metres to cm by multiplying by 100.

In Q.2(b) the best responses successfully found the number of billboards, and showed sufficient working for this and then had at least some correct calculations for finding the income. For candidates who successfully found the income, the most common cause of marks lost was for going further than necessary and finding a value for the profit.

(a) 22cm; (b) 9 billboards, £37 800 income

Question No. 3

In Q.3(a)(i) most candidates knew that an answer involving factors or multiples was required, but were not always able to express this mathematically

In Q.3(a)(ii) candidates generally found two other correct possibilities.

In Q.3(b)(ii) many candidates scored only 2 or 4 marks for finding either 4/15 or 68 or both. Once these had been found, candidates either successfully completed the question or they incorrectly associated the 4/15 with £13.60 and used this proportionally to arrive at an incorrect answer or worked with the value of the coins rather than the fractions in the bag.

Q.3(c)(i) and (ii) were generally answered correctly.

In Q.3(d)(i) the majority of candidates correctly evaluated and rounded the answer. Most who evaluated an answer remembered to round it correctly. A few candidates wrote down the correct substitution but then did not evaluate correctly.

Q.3(d)(ii) was successfully answered, with working shown to enable follow through marking from part (i).

In Q.3(e)(i) the best responses either found the central angle and used isosceles triangle facts or an exterior angle and angles on a straight line or the total interior angles for a heptagon.

In Q.3(e)(ii) the most successful responses used the length scale factor. Use of the area scale factor sometimes created difficulties when substituting back into the triangle area formula to find the missing side.

(b) 255; (c)(i) 6.65; (c)(ii) 49/200; (d)(i) 1.25; (d)(ii) 7.6; (e)(i) 64.3 (e)(ii) 85.6

Question No. 4

In Q.4(a)(i) almost all candidates scored full marks.

In Q.4(a)(ii) the best responses confidently used percentages finding either 10% or 1%, then using their answer to find the total cost.

In general in Q.4(b) candidates had difficulty expressing their geometrical reasons clearly. The most direct route to a correct solution used corresponding angles and angles in a triangle and the best responses supported their answer with clear working.

(a)(ii) 3 000 000; (b) 64

Question No. 5

The best responses to Q.5(a) set out working clearly and in a logical manner showing all steps in their reasoning.

Q.5(b) was almost always fully correct.

In Q.5(c) the best responses showed the equation clearly and then continued to solve it. Candidates were less successful in reaching an accurate solution using a trial and improvement method.

(c) 6.3 to 6.4

Question No. 6

Q.6(a) showed that most candidates were able to measure accurately using a protractor.

In Q.6(b) candidates mostly drew the bearing for 105°, but did not always relate compass angles with bearings

The best responses to Q.6(c) applied the speed distance time formula correctly. A significant number chose to give a value for the distance from the ancient tomb to the Lost Palace and worked with that towards a correct solution. The common incorrect response was to calculate 45 x 2/3

(a) 044;   (c) 67.5

Question No. 7

Q.7(a) was generally correct.

In Q.7(b) candidates either recognised that t = 0 and recognised that the instruction to write down an answer meant no further work was required or worked out 200 x ½ or worked out an answer using t = 1

(a) 10.5;   (b) 200

A382/01 Foundation Tier

General Comments:

The candidates who sat this paper were largely well-prepared and were able to demonstrate their skills in computation, reading and interpreting charts and situations and then make general statements based on sound reasoning and evidence. In this session there was a further improvement in the way candidates were recording both their working out and their calculations. Best practice included showing their ideas and methods to justify their answer. Candidates clearly made good use of their calculators but understood that answers alone are seldom acceptable in real life situations. An improving number of candidates managed to demonstrate their understanding of using a variety of formulae, using inequalities and how theoretical probabilities are established based on prior data. Candidates also showed they could use known measures of an average person to estimate values for a giant and a tiny person.

There was no evidence that students had been unable to attempt all questions within the allotted time frame of 1.5 hours.

Comments on Individual Questions:

Question No.1

In part (a) most candidates found the expected ¼ though some correctly gave $\frac{25}{100}$. Sadly a few candidates did not fully read the question answering either 0.25 or the stated 25%. When investigating the loft insulating question a number of candidates thought the ‘m2’ was part of the calculation rather than units. Such candidates then ended up with £1000s worth of saving – they could still earn the mark for a suitable comment based on their values. Other errors here included not remembering to use the brackets at the end of the formula. Nevertheless a healthy percentage of fully correct answers were seen.

In part (c) it was extremely pleasing to see the development of ideas and methods used as students progressed to their cost for lagging. Candidates appreciated the need to round up rather than down so that the whole loft would be lagged. Examiners found many scripts where there was a clear structure to their answers, often supported and supplemented by words of explanation. Such responses usually gained the best credit. Candidates coped well with their understanding of payback time in part (d). There was some confusion as to whether they should be arriving at an answer of ½ or 2 years for the energy-saving light bulbs but most candidates did manage to correctly use their previous values to arrive at their correct payback time for loft lagging. In the final part most candidates were able to identify which energy-saving method had the shortest payback time from their data though a few candidates felt the emphasis was on the saving per year rather than the shortest payback time.

Question No. 2

There was a large number of correct answers seen to part (a) though in some cases the ratio was stated the wrong way round. Some candidates also left their answer including decimals, presumably as a result of measurements they had taken from the diagram. The vast majority of candidates seemed to know how tall an average person is and were able to state this as part of their solution to part (b). The best responses gave a full and clear explanation of how their scale factor was obtained as well as remembering the appropriate unit within their answer. Most answers used the scale factor from Gulliver's head to the giant's head based on measurements taken. Some also worked on what fraction of a person's total height is taken up by their head and then these candidates applied the same scaling to the giant's head which they often said was double the height of Gulliver on the page. Such responses usually had detailed explanation and it was a delight to see such responses.

In part (c) again many candidates supported their view that Seth was indeed correct by explicit reference to the 6 correct instances from the data given. Weaker responses merely stated that ¾ was equivalent to 75% without showing reference to the data Seth had collected. Most candidates also recognised that Seth used a small sample size and that this may have a bearing on whether his conclusion is right. Some candidates just said the estate people could be different without really talking about the lack of people from whom Seth had gathered data.

The vast majority of candidates managed to plot at least two points correctly in part (d) although the vertical scale used did cause difficulty for weaker candidates who were unable to identify either 390 or more usually 352 or both on the vertical scale. In part d(iii) weaker responses tended to refer to 105mm would not fit on the graph whereas best responses correctly referred to the fact that there was no data collected for thumb measurements close to 105mm. Pleasingly a good proportion of candidates did manage to find a correct equation connecting n and t, usually n=4t.

Candidates found part (e) challenging. They often got confused with the conversion of millimetres into inches, often erroneously multiplying by 25.4 instead of dividing by 25.4. Only the best responses managed to correctly fill the flow chart despite the relevant information being listed in bullet form.

Question No.3

Most candidates were successful in evaluating the expression for t in part (a) though some were unable to express their answer correctly to two decimal places. Part (b) was effectively solved by almost all candidates though some candidates only identified the years 1976 and 2003 where there were more successes than failures whilst not considering the years where there were only successes. The vast majority of candidates were able to interpret correctly the graph in part (c) with many detailed explanations for the craft's movements between 20 and 50 seconds, usually with references to 3 bounces or similar word explanations including finally landing after 50 seconds.

In part (d) most candidates managed to interpret effectively the table of values. Better responses then were able to explain carefully that the probability of success was based on the previous eleven flights and the success of seven of them. The best responses then appreciated that the probability of a successful landing has been increasing in the past years and that this was likely to continue in the future, often with further detail about the improvement of technology in recent years.

A large proportion of candidates could read and plot co-ordinates at the start of part (e). A much smaller percentage managed to correctly find the midpoint in part (iii). Best answers usually were founded on careful working out rather than answer alone. Part (iv) caused immense problems for virtually all candidates despite the correct expression being present throughout part (v). Most candidates did manage to spot one of the correct inequalities though sadly answers with 3 or more inequalities ticked were seen despite the question asking for two inequalities to be ticked.

The vast majority of candidates were successful in finding the diameter of the crater in part (f) with best answers again coming when a candidate showed their diameter in centimetres and then multiplied it by 200. Sadly a few candidates reached answers outside an acceptable range without showing their diameter. Similarly a few candidates mistook the radius to be their diameter. There was further confusion in part (ii) as a significant number of candidates found the area of the crater rather than the circumference.

There was a large number of fully correct answers seen for part (g) with very few candidates mixing up the mean and median. When calculating the mean it was pleasing to again seen a clear method being shown which helped a good number of marks to be achieved despite a few arithmetical errors.

The best responses seen in part (h) described a decrease in temperature then an increase and finally a decrease. A minority of candidates talked about the highest or lowest temperature rather than describing a trend or general fact. Some talked about the temperatures being very hot, as opposed to very cold as they failed to take note of all the temperatures being below -30 degrees.

Part (i) was a discriminating question as only the strongest responses scored on both parts. The most common error was to multiply in part (i) and then divide in part (ii). Virtually all candidates managed to score in part (j) though marks were consistently lost by answers such as carbon dioxide as 95% in part(i) and Nitrogen as 1% in part(ii).

A pleasing number of candidates selected both the correct views in part (k) with correct answer C for the first view being more regularly seen than correct answer B for the second view. In part (l) most candidates seemed not to have considered loci at all. There were few correctly constructed responses seen and some freehand answers that were not credited. An encouraging number of correctly counted values were discovered for the estimated area and a healthy number of candidates did know to multiply their number of squares by 100. Candidates have clearly improved in estimating areas over the years.

In part (m) a healthy number of candidates gained full marks for the net, with the trapezium length proving problematical for weaker responses. There was still confusion about the difference between area and perimeter in part (ii) as a significant minority tried to find the perimeter of the scoop. Only a tiny number of candidates managed to find the correct volume for their area of scoop. In the last part most candidates managed to talk about the flow chart sending you in a loop or about the problems occurring when there was an obstacle 10cm in front of the robot or to the left or right thus preventing movement.

A382/02 Higher Tier

General Comments:

There was no evidence to suggest that candidates had insufficient time to complete the paper. However topics unique to Applications papers, such as flow diagrams and financial mathematics did not appear to have been thoroughly understood.

Use of calculators was evident throughout, but candidates need to be aware of the need to show the calculations they are performing on the calculator. Method marks cannot be gained for a final answer that is incorrect where the calculation is not written down. Additionally, it is difficult for examiners to follow calculations presented in a haphazard fashion. Methodical working, clearly set out, adds to the demonstration of candidates' mathematical knowledge and understanding and allows candidates to gain valuable marks where they have not managed to reach a fully correct solution.

Questions requiring mathematical explanation could be improved. Clarity of explanation was often poor and sometimes ambiguous. Too often responses to these types of questions lacked clarity and clear concise use of the English language. Candidates should be aware when to justify solutions through a worded explanation and when a calculation provides sufficient explanation.

Comments on Individual Questions:

Question No.1

The best responses to Q.1(a) (i) involved correctly formed sentences with correct use of mathematics terminology, such as circumference.

Q.1(a) (ii) was answered reasonably well.

The best responses to Q.1(a) (iii) addressed both a clear responses to how to collect the data and a separate response regarding bias.

Q.1(b) (i) (ii) and (iv) were generally correct. In Q.1(b) (iii) the best responses referred to the lack of data above 98 to make a comparison.

Responses to Q.1(c) (i) suggested candidates were not familiar with constructing flow diagrams; however the generally correct responses to Q.1(c) (ii) suggested that most candidates were able to interpret correctly information from a variety of sources.

(b) (iv) $n = 4t$;   (c) (ii) 17 ½

Question No. 2

Good responses to Q.2(a) showed organised method and an appreciation of degree of accuracy required when working with large numbers.

In Q.2(b) the best responses appreciated that time was continuously changing.

(a) 1.44 x 1017

Question No. 3

In Q.3(a)(i) and (ii) the best responses clearly indicated the skew on their sketch.

Q.3(b) (i) and (ii) most candidates were able to interpret the graph

In Q.3(c) (ii) the best responses clearly showed the tangent at 2pm, their working using values from the tangent and gave the units for their answer. Marks in this question were awarded for showing how values were calculated and interpretation of the scales.

Question No. 4

In Q.4(a) (i), (ii) and (iii) and b (ii) almost all candidates scored full marks.

In Q.4(b) (i) the best responses gave a clear criticism of the graph, the most common correct response identified inconsistent scaling on horizontal axis.

In Q.4(c) the best responses presented clear organised working and either efficiently used powers of 0.915 or chose a starting value, either randomly or from the graph, and used this with repeated subtraction of 8.5%.

(a)(iii) 0.832;   (c) 2019

Question No. 5

In Q.5(a) candidates needed to apply the correct interpretation of scale throughout. Many gained marks through clear working shown and the best responses to part (iii) used proportional reasoning.

In Q.5(b) (i) candidates were required to start with the information about the table and clearly show how the radius of 2.3 was arrived at, not start with the answer and use it in a calculation.

In Q.5(b) (ii) the best responses clearly set out their working, with the even better responses using an annotated sketch to identify relevant lengths of the area they were trying to find.

(a) (i) 8.2   (a) (ii) 14.3;   (a) (iii) 207 to 210;   (b) (ii) 6.63 to 6.65

Question No. 6

Q.6(a) showed that most candidates were able to measure accurately and draw a simple construction.

In Q.6(b) candidates mostly were able to identify a pair of correct positions.

The best responses to Q.6(c) showed candidates applying their knowledge of geometry and describing points J and R with reference to both Pythagoras and angles between tangent and radius.

Question No. 7

The best responses to Q.7(a) were those where decisions were supported with clear calculations.

In Q.7(b) (i) candidates who recognised trigonometry was required calculated the angle correctly. However Q.7(b) (ii) proved more challenging with the best responses using ratio or combining Pythagoras and trigonometry.

There were many clear responses to Q.7(c) (i) and Q.7 (c) (ii) was invariably correct. In Q.7 (c) (iii) plotting heights was generally accurate, however there are still too many instances of plots at mid-points. Q.7 (c) (iv) and (v) marks were available for reading from an increasing non-linear graph although in (v) good responses were seen by candidates who had used the values in the table to extrapolate an estimate.

(b) (i) 29.4; (b) (ii) 27.9; (c) (i) 61.25; (c) (ii) 21 52 92 114; (c) (iv) 62; (c) (v) 55

Question No. 8

This question showed candidates poorly understood the topic although a significant number did gain full marks across the whole question. In Q.8 (a) marks were awarded for the calculation that led to a given result. In Q.8 (b) one mark was often gained for the year but candidates failed to express themselves clearly in their justification, good responses here included a calculation showing how CPI, % change and base year of 100 are related. Q.8 (c) was either full marks or zero marks and in Q.8 (d) the best responses indicated an increase without reference to decrease.

(c) 116.1

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