HISTOGRAM

Pearson Edexcel - Monday 12 November 2018 - Paper 3 (Calculator) Higher Tier

1.

17	(a)	Histogram drawn	B3	for fully correct histogram eg relative heights 6, 3, 4, 2, 2	
			(B2	for 4 correct blocks **or** all 5 frequency ÷ class interval **and** 1 correct block)	
			(B1	for at least 2 correct blocks of different widths **or** for frequency ÷ class interval for at least 3 frequencies)	
	(b)	66 to 71	M1	indication of the median in the third interval **or** proportional method shown	Just stating the interval is sufficient for this mark May be implied by the number on the answer line
			A1	ft answer between 66 and 71	Median is at (approx.) 68.75 by a proportional method

Pearson Edexcel - Monday 6 November 2017 - Paper 2 (Calculator) Higher Tier

2.

17	(a)	1.5, 6, 10.2, 7.2, 1.2	Histogram drawn	C1	for 2 correct bars of different widths or at least 3 correct frequency densities.
				C1	for all bars in correct proportions or 4 correct bars with axes scaled and labelled.
				C1	for fully correct histogram with axes scaled and labelled.
	(b)		$\frac{123}{150}$	M1	for a method to find number of students in interval, eg $30 + 51 + 36 + \frac{1}{3} \times 18$ (= 123) or $150 - 15 - \frac{2}{3} \times 18$ (= 123)
				A1	for $\frac{123}{150}$ oe or 0.82 or 82%

Pearson Edexcel - Specimen Papers Set 2 - Paper 3 (Calculator) Higher Tier

3.

14	(a)		histogram	C1	for 2 correct bars of different widths or at least 3 correct frequency densities
				C1	all bars in correct proportions or 4 correct bars with axes scaled and labelled
				C1	fully correct histogram with axes scaled and labelled
	(b)	81 ÷ 2 = 40.5 90 to 105 is 29	108.2	C1	for 81 ÷ 2 = 40.5 and 11.5 ÷ 18 × 5 (= 3.19..)
				C1	For answer in range 108 to 109

Pearson Edexcel - Sample Paper 1 - (Non-Calculator) Higher Tier

4.

22			C1	C1 for frequencies used for heights or areas not proportional to frequencies
			C1	C1 for 2nd mistake - final bar of wrong width

Pearson Edexcel - Thursday 9 June 2016 - Paper 2 (Calculator) Higher Tier

5.

| 23 | | $0 < t \leq 5$ fd = 8 ÷ 5 = 1.6 $5 < t \leq 15$ fd = 32 ÷ 10 = 3.2 $15 < t \leq 30$ fd = 36 ÷ 15 = 2.4 $30 < t \leq 40$ fd = 18 ÷ 10 = 1.8 $40 < t \leq 60$ fd = 6 ÷ 20 = 0.3 | Correct histogram | 3 | B3 for a fully correct histogram with vertical axis correctly scaled or with a key, eg. 2 cm² = 1 (B2 for at least 4 correct blocks with or without a scale or a key OR for all five fd correct) (B1 for 2 correct blocks of different widths or for at least three correct fd values) |

Pearson Edexcel - Friday 7 November 2014 - Paper 2 (Calculator) Higher Tier

6.

| 18 | (a) | $5 \times 8 = 40$
$12.5 \times 15 = 187.5$
$17.5 \times 11 = 192.5$
$25 \times 10 = 250$
$40 \times 6 = 240$
$910 \div 50 = 18.2$ | 18.2 | 4 | M1 for fx consistently within interval including ends (allow 1 error)
M1 consistently using appropriate midpoints
M1 (dep on first M1) for $\Sigma fx \div \Sigma f$
A1 for 18.2 cao |
| | (b) | $0 \leq t < 10$ fd 0.8
$10 \leq t < 15$ fd 3
$15 \leq t < 20$ fd 2.2
$20 \leq t < 30$ fd 1
$30 \leq t < 50$ fd 0.3 | Correct histogram | 3 | B3 fully correct histogram with vertical axis correctly scaled.
(B2 for 4 correct blocks or 5 correct blocks with incorrect or no scale)
(B1 for 2 correct blocks of different widths or any 3 correct blocks or correct FD values for at least 3 frequencies) eg fd of 0.8, 3, 2.2, 1, 0.3 |

Pearson Edexcel - Tuesday 11 June 2013 - Paper 1 (Non-Calculator) Higher Tier

7.

| 24 | | $12 \div 10 = 1.2$
$15 \div 5 = 3$
$13 \div 5 = 2.6$
$18 \div 10 = 1.8$
$3 \div 15 = 0.2$ | Histogram | 3 | B3 for fully correct histogram
(B2 for 4 correct blocks)
(B1 for 3 correct blocks)

(If B0, SC B1 for correct key eg 1cm^2 = 2 (calls)
Or frequency ÷ class interval for at least 3 frequencies)

NB Apply the same mark scheme if a different frequency density is used. |

Pearson Edexcel - Monday 4 March 2013 - Paper 2 (Calculator) Higher Tier

8.

| 21 | | Total area = (0.12×40) +
(0.36×20) + (0.7×20) +
(0.56×20) + (0.18×40)
$= 44.4$

Area $(140 < w < 200) =$
(0.36×20) + (0.7×20) +
$(0.56 \times 20) = 32.4$

$32.4 \div 44.4$ | 0.73 | 4 | M1 for a method to find the frequency **or** the area of any one block

M1 for a method (with correct values) to find total area of all blocks **or** 44.4 **or** 1110 **or** a correct method (with correct values) to find total area of middle 3 blocks **or** 32.4 **or** 810

M1 (dep on M2) for a correct method to find required proportion (could lead to a decimal or a percentage or a fraction)
A1 for answer which rounds to 0.73 or 73% or $\frac{27}{37}$ or equivalent fraction |

Pearson Edexcel - Thursday 8 November 2012 - Paper 2 (Calculator) Higher Tier

9.

24			Height h m	Freq	FD
$0 < h \leq 2$	7	3.5
$2 < h \leq 4$	14	7
$4 < h \leq 8$	18	4.5
$8 < h \leq 16$	24	3
$16 < h \leq 20$	10	2.5		3	3	B3 fully correct histogram with horizontal axis correctly scaled (B2 for 4 correct blocks **or** 5 correct blocks with incorrect or no scale) (B1 for 2 correct blocks of different widths **or** any 3 correct blocks) SC : B1 for key, e.g. 1 cm^2 = 2 (trees) **or** correct values shown for (freq ÷ class interval) for at least 3 frequencies (3.5, 7, 4.5, 3, 2.5)

Pearson Edexcel - Monday 11 June 2012 - Paper 1 (Non-Calculator) Higher Tier

10.

22	(a)		Correct histogram	3	B3 for fully correct histogram (overlay) (B2 for 3 correct blocks) (B1 for 2 correct blocks of different widths) SC : B1 for correct key, eg. 1 cm² = 5 (cars) **or** correct values for (freq ÷ class interval) for at least 3 frequencies (3, 5, 3.6, 1.2) NB: The overlay shows one possible histogram, there are other correct solutions.
		F 15 25 36 24 Fd 3 5 3.6 1.2			
	(b)	$\dfrac{3}{4} \times 24$	18	2	M1 for $\dfrac{3}{4} \times 24$ (=18) oe **or** $\dfrac{1}{4} \times 24$ (=6) oe A1 cao **OR** M1 ft histogram for 15 × "1.2" **or** 5 × "1.2" A1 ft

Pearson Edexcel - Monday 5 March 2012 - Paper 4 (Calculator) Higher Tier

11.

21		$4 \div 10 = 0.4$ $8 \div 5 = 1.6$ $24 \div 5 = 4.8$ $16 \div 10 = 1.6$ $5 \div 20 = 0.25$	Bars at, for example, 0.8cm, 3.2cm, 9.6cm, 3.2 cm and 0.5 cm in height	3	B3 for fully correct histogram (B2 for 4 correct blocks B1 for 3 correct blocks) (see overlay) (If B0, SC B1 for correct key, eg 1cm² = 2.5(students) or frequency ÷ class interval for at least 3 frequencies **NB** apply the same mark-scheme if a different frequency density is used

Pearson Edexcel - Monday 14 November 2011 - Paper 4 (Calculator) Higher Tier

12.

21	(a)		34, 12	2	M1 for frequency = fd × column width, can be implied by one frequency correct **or** fd correctly marked on vertical axis (1cm = 4 units) **or** identifying 1 cm² as frequency of 4 oe A1 34 and 12 both correct
	(b)		Bars of height 6 cm and 4.5 cm	2	B1 for bar of height 6 cm B1 for bar of height 4.5 cm

Pearson Edexcel - Monday 6 June 2011 - Paper 3 (Non-Calculator) Higher Tier

13.

24	(a)		84, 60	2	B1 for 84 B1 for 60
	(b)			2	B1 for bar with width 160-180 and height 2cm (± 1 mm) B1 for bar with width 180-210 and height 6mm (± 1 mm)

Pearson Edexcel - Tuesday 9 November 2010 - Paper 3 (Non-Calculator) Higher Tier

14.

24	(a)	$\dfrac{8}{5} = 1.6$	Bar of height 3cm drawn	2	M1 for 2cm² = 1 pupil oe **or** calculation of fd = 1.6 **or** bar of area 12 cm² but not correct shape A1 cao
	(b)	$6 + 8 + 6 + 5$	25	2	B2 for 25 (B1 for frequency of 5 for number of students who watched between 20 and 30 hours)

Pearson Edexcel - Friday 11 June 2010 - Paper 4 (Calculator) Higher Tier

15.

25	(a)		12, 6	2	M1 for frequency density calculation (implied by one answer), or 1cm²=2 (trains), or fd=0.5 or 8cm²=16 A1 both 12 and 6
	(b)	Bar of height 5cm (5-10) Bar of height 1cm (30-50)	Height 5cm Height 1cm	2	M1 for frequency density calculation (implied by one correct bar) or 1cm²=2 (trains) or fd=0.5 A1 for bar of height 5cm (5 to 10) AND for bar of height 1 cm (30 to 50) 8cm²=16

Pearson Edexcel - Tuesday 10 November 2009 - Paper 4 (Calculator) Higher Tier

16.

27	(a)		30 60	2	B1 cao B1 cao
	(b)		fd = 1.5 (ht 3cm) fd = 0.5 (ht 1cm)	2	M1 for at least one correct frequency density calculated for the last 2 bars (could be implied by one correct bar) or 1 sq = 5 cars A1 cao

OCR GSCE – Thursday 5 November 2020 – Paper 5 (Non-Calculator) Higher Tier

17.

16	(a)		Refers to overlapping intervals	1		eg 10 could go into 2 intervals The same number can go in 2 places Upper value in interval should be < Both inequalities are ≤ when only one should be
16	(b)	(i)	5 × 6 and 2 × 20	2	M1 for 5 × 6 or 2 × 20	Could be written on graph Allow eg 2 × 10 + 2 × 10 for 2 × 20 Not just 30 + 40, must show products
16	(b)	(ii)	50.25 with correct working	5	B1 for frequencies 10, 20, 30, 40 M1 for mid-interval values 35, 42.5, 47.5, 60 **soi** M1 for $\sum ft$ where t is in the interval including boundaries FT *their* frequencies M1 for $\sum ft \div \sum f$ dep on previous M1 FT *their* frequencies If 0 scored, **SC2** for answer 50.25 or **SC1** for 5025 with no working	"Correct working" requires evidence of at least B1M1M1 Condone 1 error, could be on graph, Condone 1 error 10 × 35 + 20 × 42.5 + 30 × 47.5 + 40 × 60 350 + 850 + 1425 + 2400 [= 5025]

OCR GSCE – Monday 11 November 2019 – Paper 6 (Calculator) Higher Tier

18.

15	a		e.g. 300-450: 150 × 70 = 10 500 [parcels] 450-700: 250 × 50 = 12 500 [parcels] [Zoe is] not correct oe	4	**M2** for 150 × 70 and 250 × 50 or **M1** for 150 × 70 or 250 × 50 **AND** **A1** for 10 500 or 12 500 **AND** **A1** 10 500 and 12 500 and conclusion <u>Alternative method, for example:</u> **M1** for 150 x 70 soi by 10 500 **A1** for 10 500 **AND** **M1** for *their* 10 500 ÷ 250 **A1** for height of 450-700 bar is more than 42 so Zoe is not correct If **0** scored then **SC2** for 10 500 and 12 500 with no method shown or **SC3** for 10 500 and 12 500 with no method shown and correct conclusion	For full marks, calculations must be shown, together with a conclusion. Allow other equivalent methods involving consistent area calculations.
	b		Bar of height 130 drawn for 50-100g	2	**M1** for 6500 ÷ 50 soi by 130	
	c		The weights of parcels may not be evenly distributed [between 200g and 300g] oe	1		e.g. uneven distribution of weights

OCR GSCE – Tuesday 6 November 2018 – Paper 4 (Calculator) Higher Tier

19.

| 12 | | | correct bar width and 'height' of 0.6 | 5 | **M2** for 15 × 0.8 + 10 × 0.9 + 15 × 0.2 or better e.g. 12 + 9 + 3 or 24
or
M1 for two correct frequencies calculated from 12, 9 and 3
AND
M1 for 30 – *their* 24 soi 6
M1 for *their* 6 ÷ 10 soi 0.6 | |

OCR GSCE – Tuesday 2 November 2017 – Paper 4 (Calculator) Higher Tier

20.

| 10 | (a) | | $\frac{17}{30}$ | 4 | **B2** for $\frac{17}{3}$
OR

M2 for 30×0.1+20×0.5+10×0.8+ 10×0.3+30×0.2 soi by 30
or
M1 for three correct frequencies from 3, 10, 8, 3 and 6.
and
M1 for 3 + 10 + 4 or 17 | It can be done with probabilities |
| | (b) | | They were evenly spread out in the 40 – 50 class | 1 | accept any correct statement e.g. half the people in the 40 – 50 got over 45 | |

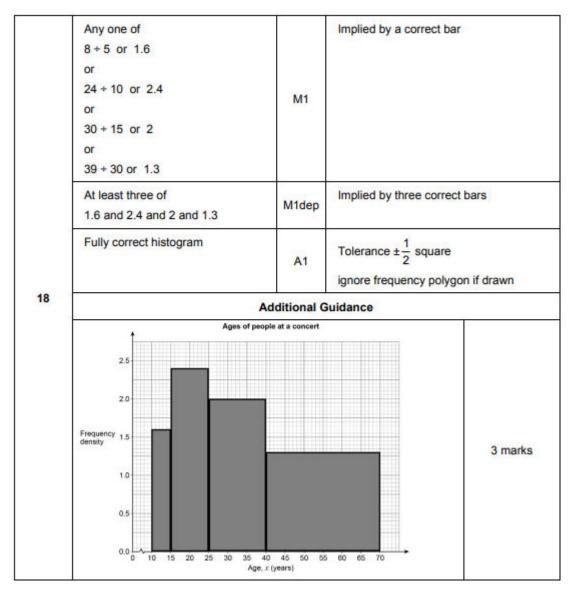**OCR GSCE – Tuesday 13 June 2017 – Paper 6 (Calculator) Higher Tier**

21.

10	a	Fds 7, 8.4, 4, 3.6, 1.4, 0.55	1	At least 3 correct; may be implied by height of 3 bars including one of the last two	
		Bars all of correct height	1	Tolerance 1 mm unless on gridlines	FT *their* scale. Heights may be indicated by a plotted point, stick etc Ignore polygon lines
		Bars all of correct width	1		Condone missing vertical lines if tops correct width
		Vertical axis with consistent linear scale starting from 0 soi and labelled 'Frequency denisity' oe	1 1 AO1.3a 3 AO2.3b	**B0** for scale 0 to 42 etc for frequency graph even if labelled frequency density	Accept abbreviations or an area key eg 1 cm^2 = 5
	b	Answer £17 to £18 inclusive with valid working and justification	4 1 AO1.3b 1 AO3.1d 1 AO3.2 1 AO3.3	**M1** for 25% of 140 = 35 or 75% of 140 = 105 **M1dep** for identification of 15 to 20 soi **A1** for answer £17 to £18 inclusive **B1dep on M1M1A1** for justification If **0** scored, then **SC1** for an answer £15 to £20	eg implied by frequencies 25 and 43 or 97 and 115 or by answer in range 15 to 20 Justification can be based on a calculation eg $\frac{10}{18}$ of 15 to 20 bar or reasoning eg 18% spent £20 and 30/31% spent £15, so 25% is just over/about halfway.

AQA GSCE – Tuesday 19 May 2020 – Paper 1 (Non - Calculator) Higher Tier

22.

Q	Answer	Mark	Comments
	5 × 2 or 10 or 10 × 3 or 30 or 5 × 4 or 20	M1	oe may be written on bars
25	74 − 5 × 2 − 10 × 3 − 5 × 4 or 74 − 10 − 30 − 20 or 14	M1dep	oe bar of area 14 implies M2
	their 14 ÷ 10 or 1.4	M1dep	implied by correct bar for their 14
	Bar drawn from 170, width 10 and height 1.4	A1	
Additional Guidance			
Bar from 170 to 175 with height 2.8			M1M1M0A0

AQA GSCE – Monday 12 November 2018 – Paper 3 (Calculator) Higher Tier

23.

Any one of $8 \div 5$ or 1.6 or $24 \div 10$ or 2.4 or $30 \div 15$ or 2 or $39 \div 30$ or 1.3	M1	Implied by a correct bar
At least three of 1.6 and 2.4 and 2 and 1.3	M1dep	Implied by three correct bars
Fully correct histogram	A1	Tolerance $\pm \frac{1}{2}$ square ignore frequency polygon if drawn

18

<div align="center">Additional Guidance</div>

Ages of people at a concert

3 marks

AQA GSCE – Tuesday 12 June 2018 – Paper 3 (Calculator) Higher Tier

24.

26(a)	**Alternative method 1** – Counting squares		
	15 or 6.6 or 2.4 (cm squares)	M1	375 or 165 or 60 (small squares)
	their 15 + their 6.6 + their 2.4 or 24 (total cm squares)	M1dep	allow one error their 375 + their 165 + their 60 or 600 (total small squares)
	$\frac{\text{their } 15}{\text{their } 24}$ or $\frac{\text{their } 375}{\text{their } 600}$ or 0.625 or $\frac{480}{\text{their } 600}$ or 0.8 (cars per small square) or $\frac{480}{\text{their } 24}$ or 20 (cars per cm square)	M1dep	oe $\frac{\text{their } 600}{480}$ or 1.25 (small squares per car) $\frac{\text{their } 24}{480}$ or 0.05 (cm square per car)
	300	A1	
	Alternative method 2 – Using f.d. scale of x per unit		
	$5x \times 15$ or $75x$ or $6.6x \times 5$ or $33x$ or $0.8x \times 15$ or $12x$ (x per cm)	M1	$25x \times 15$ or $375x$ or $33x \times 5$ or $165x$ or $4x \times 15$ or $60x$ (x per small square)
	$5x \times 15 + 6.6x \times 5 + 0.8x \times 15$ or $75x + 33x + 12x$ or $120x$ (x per cm)	M1dep	allow one error $25x \times 15 + 33x \times 5 + 4x \times 15$ or $375x + 165x + 60x$ or $600x$ (x per small square)
	their $120x = 480$ or $x = 4$	M1dep	oe $\frac{480}{\text{their } 120}$ or 4
	300	A1	

Continues on next page

	Alternative method 3 – Using a number scale of f.d. axis		
	5 × 15 or 75 or 6.6 × 5 or 33 or 0.8 × 15 or 12	M1	25 × 15 or 375 or 33 × 5 or 165 or 4 × 15 or 60
	5 × 15 + 6.6 × 5 + 0.8 × 15 or 75 + 33 + 12 or 120 (1 per cm)	M1dep	allow one error 25 × 15 + 33 × 5 + 4 × 15 or 375 + 165 + 60 or 600 (1 per small square)
26(a) cont	$\dfrac{\text{their } 15}{\text{their } 24}$ or $\dfrac{\text{their } 375}{\text{their } 600}$ or 0.625 or $\dfrac{480}{\text{their } 600}$ or 0.8 (cars per small square) or $\dfrac{480}{\text{their } 24}$ or 20 (cars per cm square)	M1dep	oe $\dfrac{\text{their } 600}{480}$ or 1.25 (small squares per car) $\dfrac{\text{their } 24}{480}$ or 0.05 (cm square per car)
	300	A1	
	Additional Guidance		
	Check diagram for working		
	Alternative method 1 Total squares must be the sum of three numbers		
	Alternative method 2 Must be the sum of three expressions		
	The correct f.d. labels for the heights of the bars are 20, 26.4 and 3.2		
	A correct frequency density scale using 1 cm = 4 units eg 4 seen on vertical scale at 1 cm 20 seen on vertical scale at 5 cm	M1M1M1 M1M1M1	

26(b)	$\dfrac{2}{3}$ × 2.4 or 1.6 or $\dfrac{2}{3}$ × 60 or 40 or $\dfrac{2}{3}$ × 48 or 10 × 0.8 × 4	M1	oe
	32	A1	
	Additional Guidance		