

Write your name here

Surname

Other names

**Pearson Edexcel**  
**Level 3 GCE**

Centre Number

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Candidate Number

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# Psychology

**Advanced Subsidiary**

**Paper 2: Biological Psychology and Learning Theories**

Monday 22 May 2017 – Afternoon

**Time: 1 hour 30 minutes**

Paper Reference

**8PS0/02**

**You do not need any other materials.**

Total Marks

## Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*

## Information

- The total mark for this paper is 70.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*
- The list of formulae and critical value tables are printed at the start of this paper.
- Candidates may use a calculator.

## Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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## FORMULAE AND STATISTICAL TABLES

### Standard deviation (sample estimate)

$$\sqrt{\left(\frac{\sum(x - \bar{x})^2}{n - 1}\right)}$$

### Spearman's rank correlation coefficient

$$1 - \frac{6 \sum d^2}{n(n^2 - 1)}$$

### Critical values for Spearman's rank

N	Level of significance for a one-tailed test				
	0.05	0.025	0.01	0.005	0.0025
	Level of significance for a two-tailed test				
	0.10	0.05	0.025	0.01	0.005
5	0.900	1.000	1.000	1.000	1.000
6	0.829	0.886	0.943	1.000	1.000
7	0.714	0.786	0.893	0.929	0.964
8	0.643	0.738	0.833	0.881	0.905
9	0.600	0.700	0.783	0.833	0.867
10	0.564	0.648	0.745	0.794	0.830
11	0.536	0.618	0.709	0.755	0.800
12	0.503	0.587	0.678	0.727	0.769
13	0.484	0.560	0.648	0.703	0.747
14	0.464	0.538	0.626	0.679	0.723
15	0.446	0.521	0.604	0.654	0.700
16	0.429	0.503	0.582	0.635	0.679
17	0.414	0.485	0.566	0.615	0.662
18	0.401	0.472	0.550	0.600	0.643
19	0.391	0.460	0.535	0.584	0.628
20	0.380	0.447	0.520	0.570	0.612
21	0.370	0.435	0.508	0.556	0.599
22	0.361	0.425	0.496	0.544	0.586
23	0.353	0.415	0.486	0.532	0.573
24	0.344	0.406	0.476	0.521	0.562
25	0.337	0.398	0.466	0.511	0.551
26	0.331	0.390	0.457	0.501	0.541
27	0.324	0.382	0.448	0.491	0.531
28	0.317	0.375	0.440	0.483	0.522
29	0.312	0.368	0.433	0.475	0.513
30	0.306	0.362	0.425	0.467	0.504

The calculated value must be equal to or exceed the critical value in this table for significance to be shown.



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**Chi-squared distribution formula**

$$X^2 = \sum \frac{(O-E)^2}{E}$$

$$df = (r - 1)(c - 1)$$

**Critical values for chi-squared distribution**

Level of significance for a one-tailed test						
	0.10	0.05	0.025	0.01	0.005	0.0005
Level of significance for a two-tailed test						
df	0.20	0.10	0.05	0.025	0.01	0.001
1	1.64	2.71	3.84	5.02	6.64	10.83
2	3.22	4.61	5.99	7.38	9.21	13.82
3	4.64	6.25	7.82	9.35	11.35	16.27
4	5.99	7.78	9.49	11.14	13.28	18.47
5	7.29	9.24	11.07	12.83	15.09	20.52
6	8.56	10.65	12.59	14.45	16.81	22.46
7	9.80	12.02	14.07	16.01	18.48	24.32
8	11.03	13.36	15.51	17.54	20.09	26.12
9	12.24	14.68	16.92	19.02	21.67	27.88
10	13.44	15.99	18.31	20.48	23.21	29.59
11	14.63	17.28	19.68	21.92	24.73	31.26
12	15.81	18.55	21.03	23.34	26.22	32.91
13	16.99	19.81	22.36	24.74	27.69	34.53
14	18.15	21.06	23.69	26.12	29.14	36.12
15	19.31	22.31	25.00	27.49	30.58	37.70
16	20.47	23.54	26.30	28.85	32.00	39.25
17	21.62	24.77	27.59	30.19	33.41	40.79
18	22.76	25.99	28.87	31.53	34.81	42.31
19	23.90	27.20	30.14	32.85	36.19	43.82
20	25.04	28.41	31.41	34.17	37.57	45.32
21	26.17	29.62	32.67	35.48	38.93	46.80
22	27.30	30.81	33.92	36.78	40.29	48.27
23	28.43	32.01	35.17	38.08	41.64	49.73
24	29.55	33.20	36.42	39.36	42.98	51.18
25	30.68	34.38	37.65	40.65	44.31	52.62
26	31.80	35.56	38.89	41.92	45.64	54.05
27	32.91	36.74	40.11	43.20	46.96	55.48
28	34.03	37.92	41.34	44.46	48.28	56.89
29	35.14	39.09	42.56	45.72	49.59	58.30
30	36.25	40.26	43.77	46.98	50.89	59.70
40	47.27	51.81	55.76	59.34	63.69	73.40
50	58.16	63.17	67.51	71.42	76.15	86.66
60	68.97	74.40	79.08	83.30	88.38	99.61
70	79.72	85.53	90.53	95.02	100.43	112.32

The calculated value must be equal to or exceed the critical value in this table for significance to be shown.



**Mann-Whitney U test formulae**

$$U_a = n_a n_b + \frac{n_a(n_a+1)}{2} - \sum R_a$$

$$U_b = n_a n_b + \frac{n_b(n_b+1)}{2} - \sum R_b$$

(U is the smaller of U<sub>a</sub> and U<sub>b</sub>)

**Critical values for the Mann-Whitney U test**

		<i>N<sub>b</sub></i>															
		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<i>N<sub>a</sub></i>																	
<b><i>p</i> ≤ 0.05 (one-tailed), <i>p</i> ≤ 0.10 (two-tailed)</b>																	
<b>5</b>	4	5	6	8	9	11	12	13	15	16	18	19	20	22	23	25	
<b>6</b>	5	7	8	10	12	14	16	17	19	21	23	25	26	28	30	32	
<b>7</b>	6	8	11	13	15	17	19	21	24	26	28	30	33	35	37	39	
<b>8</b>	8	10	13	15	18	20	23	26	28	31	33	36	39	41	44	47	
<b>9</b>	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	
<b>10</b>	11	14	17	20	24	27	31	34	37	41	44	48	51	55	58	62	
<b>11</b>	12	16	19	23	27	31	34	38	42	46	50	54	57	61	65	69	
<b>12</b>	13	17	21	26	30	34	38	42	47	51	55	60	64	68	72	77	
<b>13</b>	15	19	24	28	33	37	42	47	51	56	61	65	70	75	80	84	
<b>14</b>	16	21	26	31	36	41	46	51	56	61	66	71	77	82	87	92	
<b>15</b>	18	23	28	33	39	44	50	55	61	66	72	77	83	88	94	100	
<b>16</b>	19	25	30	36	42	48	54	60	65	71	77	83	89	95	101	107	
<b>17</b>	20	26	33	39	45	51	57	64	70	77	83	89	96	102	109	115	
<b>18</b>	22	28	35	41	48	55	61	68	75	82	88	95	102	109	116	123	
<b>19</b>	23	30	37	44	51	58	65	72	80	87	94	101	109	116	123	130	
<b>20</b>	25	32	39	47	54	62	69	77	84	92	100	107	115	123	130	138	

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$N_a$	$N_b$															
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b><math>p \leq 0.01</math> (one-tailed), <math>p \leq 0.02</math> (two-tailed)</b>																
5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
6	2	3	4	6	7	8	9	11	12	13	15	16	18	19	20	22
7	3	4	6	7	9	11	12	14	16	17	19	21	23	24	26	28
8	4	6	7	9	11	13	15	17	20	22	24	26	28	30	32	34
9	5	7	9	11	14	16	18	21	23	26	28	31	33	36	38	40
10	6	8	11	13	16	19	22	24	27	30	33	36	38	41	44	47
11	7	9	12	15	18	22	25	28	31	34	37	41	44	47	50	53
12	8	11	14	17	21	24	28	31	35	38	42	46	49	53	56	60
13	9	12	16	20	23	27	31	35	39	43	47	51	55	59	63	67
14	10	13	17	22	26	30	34	38	43	47	51	56	60	65	69	73
15	11	15	19	24	28	33	37	42	47	51	56	61	66	70	75	80
16	12	16	21	26	31	36	41	46	51	56	61	66	71	76	82	87
17	13	18	23	28	33	38	44	49	55	60	66	71	77	82	88	93
18	14	19	24	30	36	41	47	53	59	65	70	76	82	88	94	100
19	15	20	26	32	38	44	50	56	63	69	75	82	88	94	101	107
20	16	22	28	34	40	47	53	60	67	73	80	87	93	100	107	114

$N_a$	$N_b$															
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b><math>p \leq 0.025</math> (one-tailed), <math>p \leq 0.05</math> (two-tailed)</b>																
5	2	3	5	6	7	8	9	11	12	13	14	15	17	18	19	20
6	3	5	6	8	10	11	13	14	16	17	19	21	22	24	25	27
7	5	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34
8	6	8	10	13	15	17	19	22	24	26	29	31	34	36	38	41
9	7	10	12	15	17	20	23	26	28	31	34	37	39	42	45	48
10	8	11	14	17	20	23	26	29	33	36	39	42	45	48	52	55
11	9	13	16	19	23	26	30	33	37	40	44	47	51	55	58	62
12	11	14	18	22	26	29	33	37	41	45	49	53	57	61	65	69
13	12	16	20	24	28	33	37	41	45	50	54	59	63	67	72	76
14	13	17	22	26	31	36	40	45	50	55	59	64	67	74	78	83
15	14	19	24	29	34	39	44	49	54	59	64	70	75	80	85	90
16	15	21	26	31	37	42	47	53	59	64	70	75	81	86	92	98
17	17	22	28	34	39	45	51	57	63	67	75	81	87	93	99	105
18	18	24	30	36	42	48	55	61	67	74	80	86	93	99	106	112
19	19	25	32	38	45	52	58	65	72	78	85	92	99	106	113	119
20	20	27	34	41	48	55	62	69	76	83	90	98	105	112	119	127



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$N_a$	$N_b$															
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b><math>p \leq 0.005</math> (one-tailed), <math>p \leq 0.01</math> (two-tailed)</b>																
<b>5</b>	0	1	1	2	3	4	5	6	7	7	8	9	10	11	12	13
<b>6</b>	1	2	3	4	5	6	7	9	10	11	12	13	15	16	17	18
<b>7</b>	1	3	4	6	7	9	10	12	13	15	16	18	19	21	22	24
<b>8</b>	2	4	6	7	9	11	13	15	17	18	20	22	24	26	28	30
<b>9</b>	3	5	7	9	11	13	16	18	20	22	24	27	29	31	33	36
<b>10</b>	4	6	9	11	13	16	18	21	24	26	29	31	34	37	39	42
<b>11</b>	5	7	10	13	16	18	21	24	27	30	33	36	39	42	45	48
<b>12</b>	6	9	12	15	18	21	24	27	31	34	37	41	44	47	51	54
<b>13</b>	7	10	13	17	20	24	27	31	34	38	42	45	49	53	56	60
<b>14</b>	7	11	15	18	22	26	30	34	38	42	46	50	54	58	63	67
<b>15</b>	8	12	16	20	24	29	33	37	42	46	51	55	60	64	69	73
<b>16</b>	9	13	18	22	27	31	36	41	45	50	55	60	65	70	74	79
<b>17</b>	10	15	19	24	29	34	39	44	49	54	60	65	70	75	81	86
<b>18</b>	11	16	21	26	31	37	42	47	53	58	64	70	75	81	87	92
<b>19</b>	12	17	22	28	33	39	45	51	56	63	69	74	81	87	93	99
<b>20</b>	13	18	24	30	36	42	48	54	60	67	73	79	86	92	99	105

The calculated value must be equal to or less than the critical value in this table for significance to be shown.

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**Wilcoxon Signed Ranks test process**

- Calculate the difference between two scores by taking one from the other
- Rank the differences giving the smallest difference Rank 1

Note: do not rank any differences of 0 and when adding the number of scores, do not count those with a difference of 0, and ignore the signs when calculating the difference

- Add up the ranks for positive differences
- Add up the ranks for negative differences
- T is the figure that is the smallest when the ranks are totalled (may be positive or negative)
- N is the number of scores left, ignore those with 0 difference

**Critical values for the Wilcoxon Signed Ranks test**

<i>n</i>	Level of significance for a one-tailed test		
	0.05	0.025	0.01
	Level of significance for a two-tailed test		
	0.1	0.05	0.02
N=5	0	-	-
6	2	0	-
7	3	2	0
8	5	3	1
9	8	5	3
10	11	8	5
11	13	10	7
12	17	13	9

The calculated value must be equal to or less than the critical value in this table for significance to be shown.







(b) Explain **one** strength and **one** weakness of the twin study you have learnt about in biological psychology.

(4)

Strength

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Weakness

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**(Total for Question 1 = 8 marks)**

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2 Hinnah is interested in finding out if there is a relationship between drug taking and aggressive behaviour. To investigate this, she puts posters up around her college on Wednesday asking for people interested in participating in the study to attend a meeting on Friday lunchtime. Ten participants attended her meeting and gave self-report data on how many times they consumed drugs each week and how aggressive they were on a scale of 0 to 100.

(a) (i) Identify the sampling method used in Hinnah's study. (1)

(ii) Explain **one** strength and **one** weakness of using this sampling method for Hinnah's study. (4)

Strength

Weakness

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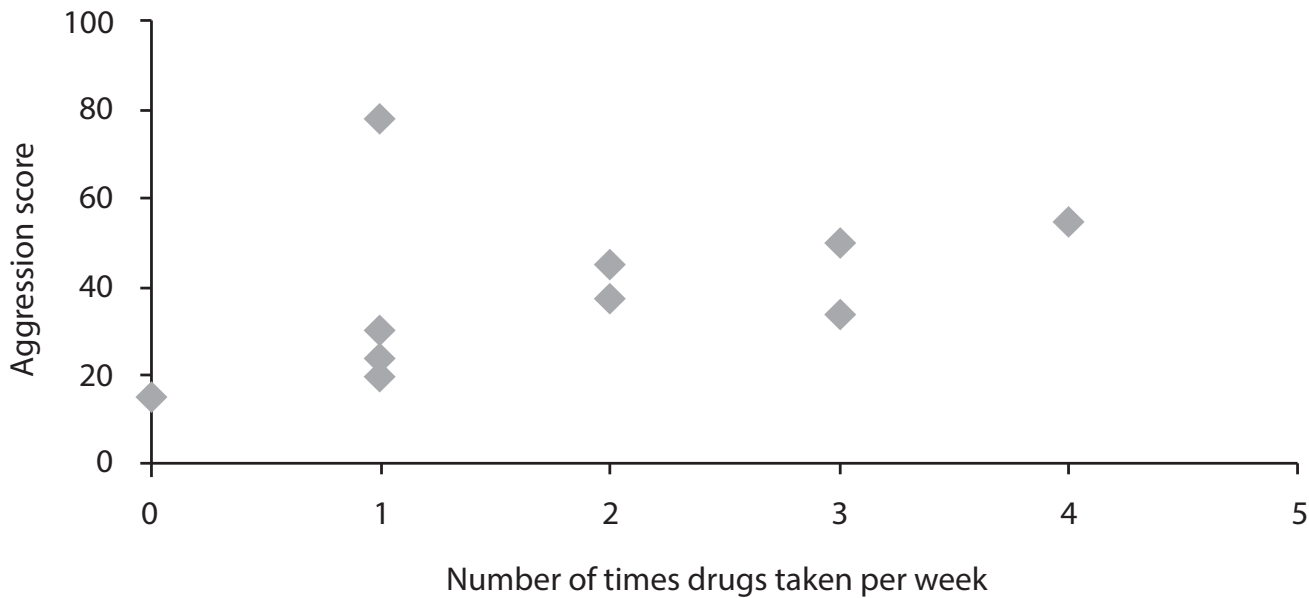
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(b) **Figure 1** shows a scatter diagram with the results of Hinnah’s correlational study.

**Scatter diagram to show the relationship between the number of times drugs were taken per week and aggression score (out of 100)**



**Figure 1**

Using **Figure 1**, identify the anomaly (outlier) on the scatter diagram by **circling** the relevant data point.

(1)

(c) Explain **one** conclusion Hinnah could make from the results in the scatter diagram.

(2)

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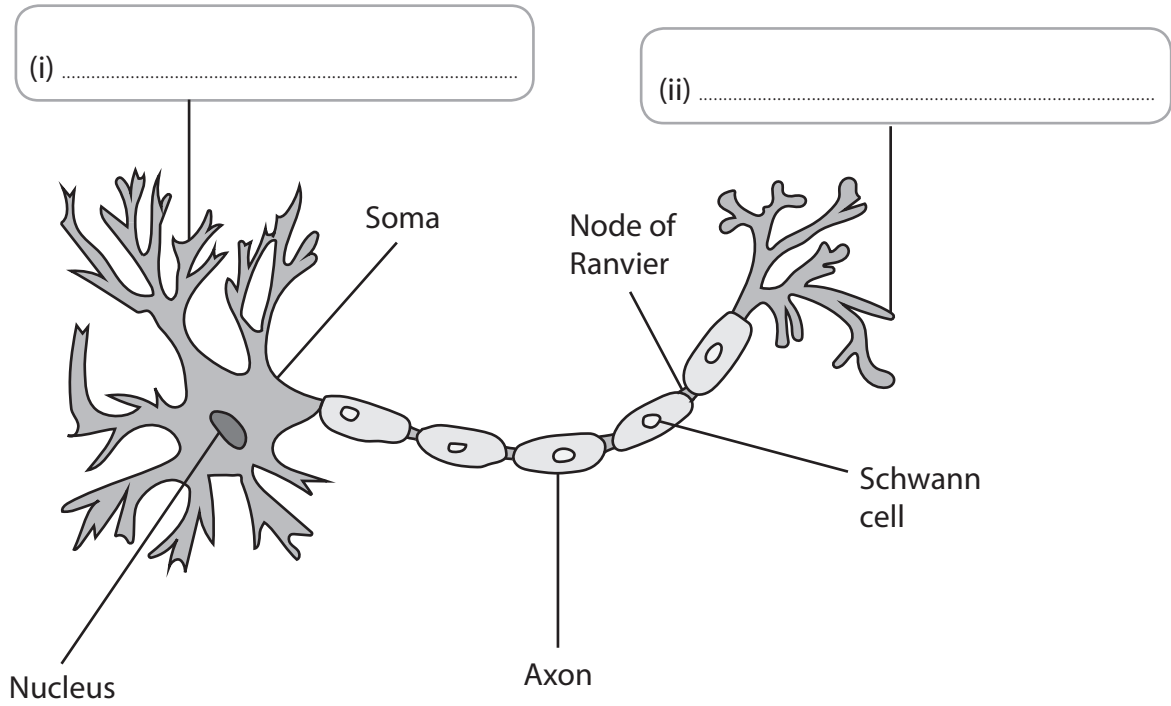
**(Total for Question 2 = 8 marks)**



3 The diagram below shows a typical neuron.

(a) Identify the areas of the diagram.

(2)



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4 Evaluate the use of brain scanning techniques to investigate human behaviour.

(8)

Area with horizontal dotted lines for writing.

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Handwriting practice area with 30 horizontal dotted lines.

**(Total for Question 4 = 8 marks)**

**TOTAL FOR SECTION A = 29 MARKS**



**SECTION B: LEARNING THEORIES**

5 Jayne owns a cafe called Rainfall and wants to encourage people to continue to buy coffee from her shop. She decides to give her customers a card where they can accumulate cup shaped stamps when they buy a hot drink. Once Jayne’s customers have been given 10 stamps they are given a free hot drink.

(a) Identify the primary reinforcer and secondary reinforcer in this scenario.

(2)

Primary reinforcer

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Secondary reinforcer

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(b) Describe how Jayne could use **two** schedules of reinforcement to encourage her customers to buy hot drinks from her cafe.

(4)

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**(Total for Question 5 = 6 marks)**

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6 As part of your AS Psychology specification you were required to carry out a practical investigation when studying learning theories.

(a) Describe the aim of the practical investigation you carried out when studying learning theories.

(2)

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(b) As part of your practical investigation you were required to analyse the findings to produce results, including a chi squared test.

Describe the results of your quantitative data analysis for the practical investigation you carried out when studying learning theories.

(3)

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(b) Explain **one** weakness of social learning theory.

(2)

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**(Total for Question 7 = 6 marks)**

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**(Total for Question 8 = 8 marks)**

**TOTAL FOR SECTION B = 29 MARKS**





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Large writing area with horizontal dotted lines.



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**(Total for Question 9 = 12 marks)**

**TOTAL FOR SECTION C = 12 MARKS  
TOTAL FOR PAPER = 70 MARKS**





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