

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Pearson Edexcel
Level 3 GCE

Centre Number

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Candidate Number

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Thursday 16 May 2019

Afternoon (Time: 1 hour 30 minutes)

Paper Reference **8PS0/02**

Psychology

Advanced Subsidiary

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

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 statistical 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.
- 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

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					
N	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

df	Level of significance for a one-tailed test					
	0.10	0.05	0.025	0.01	0.005	0.0005
df	Level of significance for a two-tailed test					
	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.



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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_a and U_b)

Critical values for the Mann-Whitney U test

		N_b															
		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
N_a																	
$p \leq 0.05$ (one-tailed), $p \leq 0.10$ (two-tailed)																	
5	4	5	6	8	9	11	12	13	15	16	18	19	20	22	23	25	
6	5	7	8	10	12	14	16	17	19	21	23	25	26	28	30	32	
7	6	8	11	13	15	17	19	21	24	26	28	30	33	35	37	39	
8	8	10	13	15	18	20	23	26	28	31	33	36	39	41	44	47	
9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	
10	11	14	17	20	24	27	31	34	37	41	44	48	51	55	58	62	
11	12	16	19	23	27	31	34	38	42	46	50	54	57	61	65	69	
12	13	17	21	26	30	34	38	42	47	51	55	60	64	68	72	77	
13	15	19	24	28	33	37	42	47	51	56	61	65	70	75	80	84	
14	16	21	26	31	36	41	46	51	56	61	66	71	77	82	87	92	
15	18	23	28	33	39	44	50	55	61	66	72	77	83	88	94	100	
16	19	25	30	36	42	48	54	60	65	71	77	83	89	95	101	107	
17	20	26	33	39	45	51	57	64	70	77	83	89	96	102	109	115	
18	22	28	35	41	48	55	61	68	75	82	88	95	102	109	116	123	
19	23	30	37	44	51	58	65	72	80	87	94	101	109	116	123	130	
20	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
$p \leq 0.01$ (one-tailed), $p \leq 0.02$ (two-tailed)																
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
$p \leq 0.025$ (one-tailed), $p \leq 0.05$ (two-tailed)																
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



P 5 7 0 7 9 A 0 5 2 8

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



Answer ALL questions.

SECTION A: BIOLOGICAL PSYCHOLOGY

1 Scanning techniques have been used in biological psychology.

(a) State the purpose of the PET brain-scanning technique.

(1)

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(b) Explain **one** strength and **one** weakness of the PET brain-scanning technique.

(4)

Strength

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Weakness

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(Total for Question 1 = 5 marks)

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2 In biological psychology you will have learned about one of the following contemporary studies:

- Li et al. (2013)
- Brendgen et al. (2005)
- Van den Oever et al. (2008).

(a) Describe the procedure of your chosen contemporary study.

(3)

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(b) Explain **one** strength and **one** weakness of your chosen contemporary study.

(4)

Strength

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Weakness

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(Total for Question 2 = 7 marks)

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- 3 Daniel carried out an investigation to find out if exercise was related to self-reported "wellbeing". He visited his local gym and asked members to record how many hours of exercise they do over a week.

At the end of the week, they all met in the gym coffee shop where Daniel asked each person to complete a "wellbeing" questionnaire. The questionnaire consisted of four questions; an example is shown in **Figure 1**.

Wellbeing questionnaire
(Please circle your answer)

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
--------------------------	-----------------	----------------	--------------	-----------------------

Question 1:
I feel relaxed 1 2 3 4 5

Figure 1

The responses were given an overall score between 4 and 20, with a high score indicating high "wellbeing".

- (a) State a fully operationalised non-directional (two-tailed) alternate hypothesis for Daniel's investigation.

(2)

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The results of Daniel's investigation are shown in **Table 1**.

Gym Member	Number of hours exercised in a week	"Wellbeing" score
A	1	4
B	2	8
C	7	8
D	5	9
E	8	11
F	11	11
G	12	18
H	14	18
I	4	9
J	9	10

Table 1



(b) Complete **Table 2** and calculate Spearman's rank correlation coefficient between the number of hours exercised in a week and a "wellbeing" score between 4 and 20.

(4)

Number of hours exercised in a week	Rank 1	"Wellbeing" score	Rank 2	d	d ²
1	1	4	1		
2	2	8	2.5		
7	5	8	2.5		
5	4	9	4.5		
8	6	11	7.5		
11	8	11	7.5		
12	9	18	9.5		
14	10	18	9.5		
4	3	9	4.5		
9	7	10	6		
				Total:	

Table 2

SPACE FOR CALCULATIONS

Spearman's rank correlation coefficient

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- (c) The participant sample in Daniel's investigation consisted of eight males and two females.

Calculate what fraction of Daniel's sample were male.

You must express your answer in its simplest form.

(1)

SPACE FOR CALCULATIONS

Fraction

- (d) Explain **one** improvement that Daniel could make to increase the validity of his investigation.

(2)

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(Total for Question 3 = 9 marks)

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4 Evaluate the role of the central nervous system (CNS) and neurotransmitters in explaining human behaviour.

(8)

Area with horizontal dotted lines for writing the answer.

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Handwriting practice area with 20 horizontal dotted lines.

(Total for Question 4 = 8 marks)

TOTAL FOR SECTION A = 29 MARKS



SECTION B: LEARNING THEORIES

5 When studying learning theories, you will have learned about different types of observations.

(a) Define what is meant by a naturalistic observation.

(1)

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(b) Explain **one** strength and **one** weakness of the naturalistic observation method.

(4)

Strength

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Weakness

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(Total for Question 5 = 5 marks)

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- 7 Brian completed a study that investigated anti-social behaviour in seven popular television programmes filmed in 2000 and 2016. He watched four hours of each programme and came up with a list of themes, such as swearing, name calling and kicking. Brian recorded the number of instances of anti-social behaviour according to each of the themes.

Table 3 shows the results of Brian's analysis.

Television programme	Number of anti-social behaviours recorded in programmes filmed in 2000	Number of anti-social behaviours recorded in programmes filmed in 2016
A	75	129
B	103	119
C	54	96
D	78	176
E	54	68
F	145	173
G	134	187

Table 3

- (a) Calculate the mode for the number of anti-social behaviours recorded in programmes filmed in 2000.

(1)

SPACE FOR CALCULATIONS

Mode score

- (b) Calculate the range for the number of anti-social behaviours recorded in programmes filmed in 2016.

(1)

SPACE FOR CALCULATIONS

Range



(c) Explain **one** strength and **one** weakness of Brian using thematic analysis to analyse the television programmes.

(4)

Strength

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Weakness

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(Total for Question 7 = 6 marks)

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9 Evaluate operant conditioning as a way of explaining human behaviour.

(8)

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(Total for Question 9 = 8 marks)

TOTAL FOR SECTION B = 29 MARKS



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(Total for Question 10 = 12 marks)

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



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