Write your name here

Surname	Other names

Pearson Edexcel
International Advanced Level

Centre Number | Candidate Number

Psychology

International Advanced Subsidiary
Paper 2: Biological Psychology, Learning Theories and Development

Monday 23 May 2016 – Afternoon
Time: 2 hours

Paper Reference
WPS02/01

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 96.
- 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.
- 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**
4	1.000	1.000	1.000	1.000	1.000
5	0.700	0.900	0.900	1.000	1.000
6	0.657	0.771	0.829	0.943	0.943
7	0.571	0.679	0.786	0.857	0.893
8	0.548	0.643	0.738	0.810	0.857
9	0.483	0.600	0.683	0.767	0.817
10	0.442	0.564	0.649	0.733	0.782
11	0.418	0.527	0.609	0.700	0.755
12	0.399	0.504	0.587	0.671	0.727
13	0.379	0.478	0.560	0.648	0.698
14	0.367	0.459	0.539	0.622	0.675
15	0.350	0.443	0.518	0.600	0.654
16	0.338	0.427	0.503	0.582	0.632
17	0.327	0.412	0.482	0.558	0.606
18	0.317	0.400	0.468	0.543	0.590
19	0.308	0.389	0.456	0.529	0.575
20	0.299	0.378	0.444	0.516	0.561
21	0.291	0.369	0.433	0.503	0.549
22	0.284	0.360	0.423	0.492	0.537
23	0.277	0.352	0.413	0.482	0.526
24	0.271	0.344	0.404	0.472	0.515
25	0.265	0.337	0.396	0.462	0.505
26	0.260	0.330	0.388	0.453	0.496
27	0.255	0.323	0.381	0.445	0.487
28	0.250	0.317	0.374	0.437	0.479
29	0.245	0.312	0.367	0.430	0.471
30	0.241	0.306	0.361	0.423	0.463

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

$$X^2 = \sum \frac{(O-E)^2}{E} \qquad df = (r-1)(c-1)$$

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.

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

	Level of significance for a one-tailed test		
	0.05	0.025	0.01
	Level of significance for a two-tailed test		
n	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.

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SECTION A

Answer ALL questions in this section. Write your answers in the spaces provided.

1 As part of his psychology course, Jacob investigated the relationship between aggression and antisocial behaviour. He decided to use a twin study. His sample consisted of monozygotic (MZ) and dizygotic (DZ) twins.

Jacob's results are displayed in **Table 1**.

Sample	Concordance rate between aggression and antisocial behaviour
Monozygotic twins	87%
Dizygotic twins	67%

Table 1

(a) Identify which sample of twins has a higher genetic relatedness between aggression and antisocial behaviour.

(1)

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(b) Jacob used a twin study for this investigation.

Explain **one** strength and **one** weakness of the twin study method.

(4)

Strength

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Weakness

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(c) Explain **one** conclusion that Jacob might draw from his results.

(2)

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(Total for Question 1 = 7 marks)

2 Describe the role of infradian rhythms in explaining human behaviour.

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(Total for Question 2 = 4 marks)

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3 Siffre (1972) conducted research to test the 24-hour sleep-wake cycle. He lived underground for 205 days where there were no zeitgebers such as natural light. Siffre did not know what time it was, although he did have contact with the outside world via a telephone. His behaviour was monitored, including when he went to sleep, when he woke, and when he ate meals. The results found that he experienced a change in his daily sleep-wake cycle up to approximately 48 hours.

(a) Identify the type of bodily rhythm that Siffre (1972) was researching.

(1)

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(b) Explain, using research, why the regulation of an internal body clock could change.

(4)

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(c) Explain **one** weakness of research conducted into the sleep-wake cycle.

(2)

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(Total for Question 3 = 7 marks)

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4 A researcher studied the influence of light therapy on individuals with Seasonal Affective Disorder (SAD). He selected participants with a diagnosis of SAD symptoms for two or more years. They completed a self-assessment questionnaire about their mood before the light therapy treatment. They were treated with two hours of light therapy for eight weeks. Following this, the researcher reassessed their mood levels using the same questionnaire.

(a) State a one-tailed (directional) hypothesis for this study.

(3)

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(b) The results of the study are given in **Table 2** below.

Participant	Mood self-assessment score before light therapy (out of 100)	Mood self-assessment score after light therapy (out of 100)
1	38	58
2	66	71
3	34	54
4	40	51
5	36	63
6	30	55
7	42	66
8	41	68
9	27	58
10	46	56

Table 2

(i) Calculate the mean scores for before and after light therapy using the data in **Table 2**.

(2)

Mean mood self-assessment score before light therapy.....

Mean mood self-assessment score after light therapy.....

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(ii) Draw and title a suitable graph to represent the mean scores for this study.

(3)

Title: .....

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(Total for Question 4 = 8 marks)

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5 Evaluate Raine et al's (1997) study into brain abnormality in murderers.

(Total for Question 5 = 8 marks)

TOTAL FOR SECTION A = 34 MARKS

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SECTION B

Answer ALL questions. Write your answers in the spaces provided.

6 Shamilla wanted to investigate the speed of cars being driven both with and without passengers. Using a hand held speed recorder, she measured the speed of cars and noted their occupancy.

Table 3 shows the results Shamilla recorded.

Speed of cars being driven without passengers Km/h	Speed of cars being driven with passengers Km/h
56	58
60	50
66	53
53	58
55	53
61	42
47	52
71	44
60	61
55	40

Table 3

(a) Calculate the median speed for cars without passengers and the median speed for cars with passengers.

(2)

Median speed for cars without passengers .....

Median speed for cars with passengers .....

(b) Calculate the range of speed for cars without passengers and the range of speed for cars with passengers.

(2)

Range of speed for cars without passengers .....

Range of speed for cars with passengers .....

(c) Shamilla may have wanted to consider using standard deviation instead of the range as her measure of dispersion.

Explain why standard deviation may have been more appropriate.

(2)

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(d) Explain **two** reasons why Shamilla chose to use a non-participant observation method for her research.

(4)

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(e) There are many variables that could have affected the results Shamilla recorded on the day of her observations.

Explain **two** extraneous variables that could have affected the results.

(4)

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(Total for Question 6 = 14 marks)

7 During your course you will have learned about Watson and Rayner's (1920) classic study 'Little Albert: Conditioned emotional reactions'.

(a) Describe the procedure of the Watson and Rayner (1920) classic study.

(4)

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(b) Explain **one** strength and **one** weakness of the Watson and Rayner (1920) classic study.

(4)

Strength

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Weakness

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(c) Suggest **two** ethical improvements you could make to the Watson and Rayner (1920) classic study.

(4)

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(Total for Question 7 = 12 marks)

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8 Harry and Lucy are twins who need to learn to put their toys away after playing with them.

Discuss how Learning Theories could help teach the twins to put their toys away after playing with them.

(Total for Question 8 = 8 marks)

TOTAL FOR SECTION B = 34 MARKS

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SECTION C

Answer ALL questions. Write your answers in the spaces provided.

9 Maria has a phobia of cats, which means that she can no longer visit her friend, Alice, who has just bought a cat.

Evaluate systematic desensitisation as a treatment/therapy for Maria's phobia.

You must make reference to the context in your answer.

(12)

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(Total for Question 9 = 12 marks)

10 Liam is a 14-year-old boy who has been getting into trouble at school for fighting with other boys.

To what extent does biological psychology and learning theories and development explain Liam's aggressive behaviour?

You must make reference to the context in your answer.

(16)

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(Total for Question 10 = 16 marks)

TOTAL FOR SECTION C = 28 MARKS
TOTAL FOR PAPER = 96 MARKS

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