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 22 May 2017 – 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 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.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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Pearson

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.

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.

SECTION A

BIOLOGICAL PSYCHOLOGY

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

1 Jayla used a PET scan to research the areas of the brain that are active when reading a poem and when completing mathematical sums.

Jayla's research used an opportunity sample of 13 students aged between 18 and 22 years from a local university. Each student had two PET scans. One whilst reading a poem and a second whilst completing mathematical sums.

(a) Explain **one** strength of Jayla using a PET scan in her research.

(2)

(b) Explain **two** ways Jayla could have improved her study.

(4)

1

2

(c) Jayla decided to check her data using a statistical test at $p \leq 0.05$ in order to avoid a type I error.

Define the term 'type I error'.

(1)

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.....

(Total for Question 1 = 7 marks)

2 Lysander is undergoing light therapy for his seasonal affective disorder. He finds that in the winter he no longer wants to play football and spends more time in bed.

(a) Identify **three** symptoms of seasonal affective disorder that Lysander may have.

(3)

1 .....

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2 .....

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3 .....

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(b) Describe how light therapy would be used as a treatment for Lysander's seasonal affective disorder.

(3)

(Total for Question 2 = 6 marks)

3 Arissa wanted to conduct a correlation study for her psychology coursework. She decided to research whether the number of brothers and sisters her participants have affects the number of children her participants have.

(a) State a directional (one-tailed) hypothesis for Arissa's study.

(1)

(b) Arissa asked her teachers how many brothers, sisters and children they have. The results are shown in **Table 1**.

Calculate the standard deviation by completing **Table 1** below.

You **must** give your answer to two decimal places.

The formulae and statistical tables can be found at the front of the paper.

(4)

Teacher	**Number of children teacher has**	$x - \overline{x}$	$(x - \overline{x})^2$
A	2	–1.2	
B	1	–2.2	
C	4	0.8	
D	3	–0.2	
E	6	2.8	
Mean number of children	3.2	Sum of differences^2	
Standard deviation =			

Table 1

Space for calculations.

(c) Arrissa carried out a Spearman's rank test for a one-tailed test and found a calculated value of –0.58.

Explain whether Arissa's results were significant at $p \leq 0.05$.

(2)

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(Total for Question 3 = 7 marks)

4 (a) Identify **two** areas of the brain that are thought to influence aggression in humans.

(2)

1 .....

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2 .....

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(b) Explain **one** strength and **one** weakness of brain functioning as an explanation of aggression in humans.

(4)

Strength

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Weakness

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(Total for Question 4 = 6 marks)

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5 In your studies of biological psychology you will have learned about one of the following contemporary studies in detail.

- Brendgen et al. (2005) Examining genetic and environmental effects on social aggression: A study of 6-year-old twins
- McDermott et al. (2008) Monoamine oxidase A gene (MAOA) predicts behavioural aggression
- Hoefelmann et al. (2006) Behaviours associated to sleep among high school students: cross-sectional and prospective analysis.

Evaluate **one** contemporary study from biological psychology.

(8)

(Total for Question 5 = 8 marks)

TOTAL FOR SECTION A = 34 MARKS

SECTION B

LEARNING THEORIES AND DEVELOPMENT

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

6 Patricio is carrying out an observation to investigate whether children aged one year or four years prefer to play together or play alone. He observes two groups of children playing.

(a) State **one** way Patricio may have operationalised the variable of 'children playing together'.

(1)

.....

.....

(b) The results of Patricio's observation are shown in **Table 2** below.

Age of the children in years	Number of children playing together	Number of children playing alone
One	2	8
Four	7	3

Table 2

Calculate the percentage of children aged one year old who play together out of the total number of children who play together.

You **must** give your answer to two decimal places.

(1)

Space for calculations

Percentage score .....

(c) Patricio calculated the range for his results.

Define what is meant by the term 'range'.

(1)

(d) Patricio used an overt observation for his study.

Explain **one** strength and **one** weakness of overt observations as a research method.

(4)

Strength

Weakness

(Total for Question 6 = 7 marks)

7 Katya has a fear of wasps. She was stung by a wasp as a child.

(a) Define the term 'unconditioned stimulus' (UCS) as it is used in classical conditioning.

(1)

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(b) State the neutral stimulus (NS) that had no original effect on Katya's behaviour.

(1)

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(c) Give the conditioned response (CR) that Katya shows.

(1)

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.....

(d) Compare classical conditioning and operant conditioning.

(6)

(Total for Question 7 = 9 marks)

8 In your studies of learning theories and development you will have conducted a practical investigation.

(a) Describe the sampling method you used in your learning theories and development practical investigation.

(2)

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(b) Describe the results of the quantitative data that you gathered in your learning theories and development practical investigation.

(2)

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(c) Explain **one** weakness of your learning theories and development practical investigation in terms of reliability.

(2)

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(Total for Question 8 = 6 marks)

9 Harbinder is carrying out an experiment to see if there is a difference in the amount of time it takes mice to run through a maze.

Each mouse is given 10 practice runs of the maze. Half the mice are given a food pellet each time they complete a practice run successfully, and half the mice do not get a food pellet at the end of each successful run.

Harbinder then times how long it takes each mouse to complete the maze.

(a) State the independent variable (IV) of Harbinder's experiment.

(1)

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(b) State the dependent variable (DV) of Harbinder's experiment.

(1)

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(c) Describe **one** ethical issue that needs to be considered when using animals in psychological research.

(2)

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(Total for Question 9 = 4 marks)

10 Assess the use of dream analysis as a therapy.

(8)

(Total for Question 10 = 8 marks)

TOTAL FOR SECTION B = 34 MARKS

SECTION C

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

11 In your studies of learning theories and development you will have learned about the following classic study in detail:

- Watson and Rayner (1920) Little Albert: Conditioned emotional reactions

Evaluate the classic study by Watson and Rayner (1920).

(12)

(Total for Question 11 = 12 marks)

12 Nalu's father works night shifts. When his father comes home from work he stays up until 1 o'clock (1300h) in the afternoon, then he sleeps for four hours before getting up to go back to work. Nalu has just started a new job where he also has to work night shifts like his father.

In the morning, when he gets home from his night shift, Nalu finds it difficult to go to sleep.

To what extent can biological psychology and learning theories explain why Nalu finds it hard to go to sleep in the morning?

(16)

(Total for Question 12 = 16 marks)

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