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Candidate surname	Other names

Pearson Edexcel Level 3 GCE

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Time 2 hours

Paper reference **9PS0/03**

Psychology

Advanced

PAPER 3: Psychological skills

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 80.
- 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.
- Good luck with your examination.

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

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

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.

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															
N_a	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
***p* ≤ 0.05 (one-tailed), *p* ≤ 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

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

	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.

Answer ALL questions.

SECTION A

Research Methods

1 Instagram study

Researchers investigated whether there was a difference in how an Instagram user perceived their own personality compared to how others would perceive their personality. Four Instagram users (group 1) and 65 observers (group 2), who did not know the Instagram users, were recruited for the study.

Instagram users (group 1) had to complete a self-report personality test that measured a number of personality traits, including extraversion and openness.

- Extraversion (categorised by sociable traits) included statements such as 'I see myself as enthusiastic'.
- Openness (a curiosity for artistic pursuits and appreciation for alternative viewpoints) included statements such as 'I see myself as open to new experiences'.

Each participant rated themselves on a scale from 1 (strongly disagree) to 7 (strongly agree), as shown in **Figure 1**.

Strongly disagree	Moderately disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Moderately agree	Strongly agree
1	2	3	4	5	6	7

Figure 1

The observers (group 2) viewed screenshots of the Instagram users' profiles. They were then asked to complete an adapted form of the same personality test to measure their perception of each of the four Instagram users (group 1).

The researchers compared the mean self-report scores of the Instagram users (group 1) to the mean scores as rated by the observers (group 2) on the different personality measures.

The results of the Instagram study are shown in **Table 1**.

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Rater	Extraversion (1–7)	Openness (1–7)
Instagram user 1 self-rating	3.00	7.00
Observers' mean rating for Instagram user 1's profile	4.61	5.20
Instagram user 2 self-rating	3.50	6.00
Observers' mean rating for Instagram user 2's profile	5.12	5.91
Instagram user 3 self-rating	5.00	5.50
Observers' mean rating for Instagram user 3's profile	5.14	5.13
Instagram user 4 self-rating	3.50	6.50
Observers' mean rating for Instagram user 4's profile	3.61	5.60

(Source: adapted from Harris and Bardey (2019))

Table 1

(a) Explain **one** conclusion you can make regarding 'extraversion' using the data in **Table 1**.

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(b) Explain **one** conclusion you can make regarding 'openness' using the data in **Table 1**.

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(c) Explain **one** strength of the researchers collecting quantitative data in the Instagram study.

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(d) The researchers in the Instagram study decided to carry out follow-up unstructured interviews with the observers (group 2).

Explain **two** strengths of using an unstructured interview with the observers (group 2) in the Instagram study.

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(Total for Question 1 = 10 marks)

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2 Navigation study

Researchers wanted to investigate whether there were sex differences in navigation strategy and efficiency.

The researchers created a virtual reality (VR) maze and placed five objects in various parts of the maze, such as a chair or a rubber duck. Participants were required to orientate themselves around the maze until they had seen all five objects, as indicated by black dots in **Figure 2**.

Figure 2 shows an aerial view of the maze and **Figure 3** shows the view a participant would have seen.

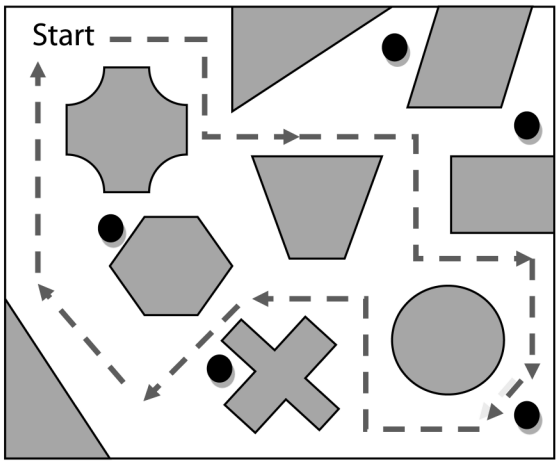

Figure 2

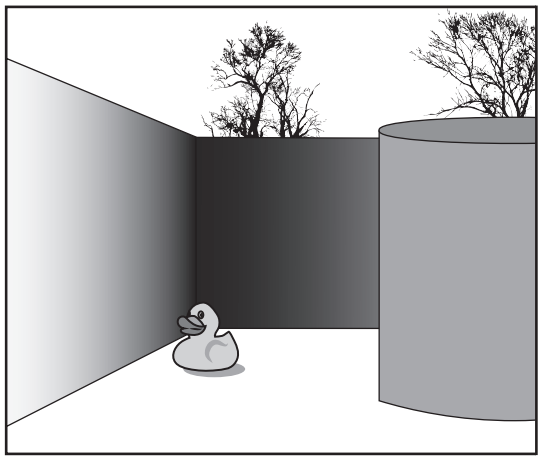

Figure 3

The researchers wanted to assess the strategy used by males and females after they had completed the maze.

(a) The researchers of the navigation study decided to recruit a sample of participants from the local town.

Describe how the researchers could have used a random sampling technique to recruit the participants for the navigation study from the local town.

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(b) Explain **one** weakness of using a random sampling technique for the navigation study.

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Figure 4 shows the strategies used by males and females in the navigation study.

A comparative bar chart to show the strategies used by males and females in the navigation study

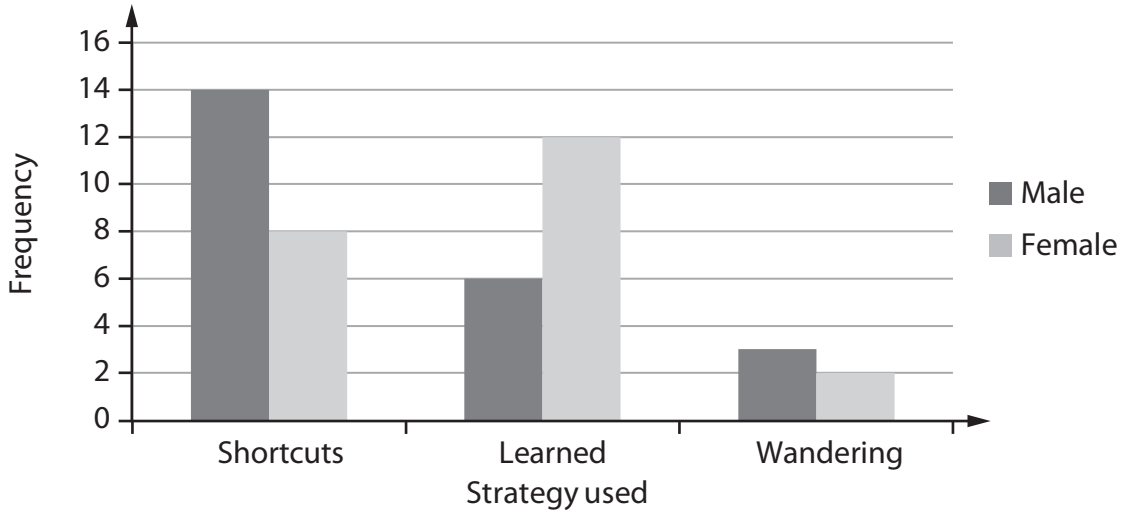

Figure 4

(c) Explain **one** conclusion the researchers of the navigation study could make using the data in **Figure 4**.

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(d) The researchers of the navigation study also collected the time taken for males and females to complete the maze task.

They summarised their data using categories, which is displayed in **Table 2**.

	Less than 1 minute to complete the maze task	**More than 1 minute to complete the maze task**
Males	14	9
Females	10	12

Table 2

Using their summarised data, the researchers decided to carry out a chi-squared test to see if there was a difference in the time taken by males and females to complete the maze task.

Complete **Table 3** to calculate the chi-squared test for the navigation study.

You must give all your answers to **two** decimal places.

(4)

		Observed	**Expected**	**O-E**	**$(O-E)^2$**	**$(O-E)^2/E$**
Males	**Less than 1 minute to complete the maze task**	14	12.27			
	More than 1 minute to complete the maze task	9	10.73			
Females	**Less than 1 minute to complete the maze task**	10	11.73			
	More than 1 minute to complete the maze task	12	10.27			
					Chi-squared =	

Table 3

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(e) Explain **two** improvements that the researchers could make to the navigation study.

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(Total for Question 2 = 14 marks)

TOTAL FOR SECTION A = 24 MARKS

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SECTION B

Review of Studies

3 Scary and nasty beasts study

With animal phobias being one of the most prevalent mental health disorders researchers wanted to investigate the creatures people found most scary and revolting.

Researchers asked 1,798 participants to complete an online survey about 10 creatures, such as a spider or snail. They were shown each creature in a photograph in a random order. Participants had to rate their fear and disgust for each of the creatures on a scale from 1 (no fear/disgust) to 7 (extreme fear/disgust). A red panda was used as one of the 10 creatures shown to participants, as a control stimulus.

The results of the scary and nasty beasts study are shown in **Table 4**.

Creature	Mean fear (1–7)	Mean disgust (1–7)
Bull	3.84	1.62
Cockroach	3.10	4.16
Pigeon	1.48	2.01
Red panda	1.57	1.17
Snail	1.15	1.69
Snake	4.34	2.83
Spider	4.39	4.47
Tapeworm	3.60	4.83

(Source: adapted from Polák et al. (2019))

Table 4

(a) Explain **one** weakness of the scary and nasty beasts study in terms of validity.

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(b) Using research evidence, explain how far evolution and natural selection could account for the findings of the scary and nasty beasts study.

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(Total for Question 3 = 8 marks)

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4 Evaluate the classic studies by Raine et al. (1997) and Watson and Rayner (1920) in terms of the role of nature and nurture.

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(Total for Question 4 = 16 marks)

TOTAL FOR SECTION B = 24 MARKS

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SECTION C

Issues and Debates

5 During the college summer holiday, Rhianna went to a large music festival where she saw musicians and bands who played various genres of music. These included rock, dance, hip hop, grime, and pop music genres. Rhianna enjoyed dancing and singing with her three best friends when listening to all of the music genres at the festival. They all joined in when the artists encouraged certain behaviours such as clapping hands or singing lyrics.

When listening to music on her iPhone, Rhianna really enjoys listening to rock and pop music genres but does not really like grime or hip hop.

Evaluate how far social psychology can account for human behaviour, such as that of listening to music.

You must make reference to the context in your answer.

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(Total for Question 5 = 12 marks)

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6 Assess the cultural and gender issues in psychological research.

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TOTAL FOR SECTION C = 32 MARKS
TOTAL FOR PAPER = 80 MARKS

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