

Please check the examination details below before entering your candidate information

|                                                                                    |  |                                                                                                   |             |  |  |  |  |                                                                                                      |  |  |  |  |  |
|------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------|-------------|--|--|--|--|------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| Candidate surname<br><i>StemUp Model Solution</i>                                  |  | Other names                                                                                       |             |  |  |  |  |                                                                                                      |  |  |  |  |  |
| Pearson Edexcel<br>Level 3 GCE                                                     |  | Centre Number<br><table border="1"><tr><td></td><td></td><td></td><td></td><td></td></tr></table> |             |  |  |  |  | Candidate Number<br><table border="1"><tr><td></td><td></td><td></td><td></td><td></td></tr></table> |  |  |  |  |  |
|                                                                                    |  |                                                                                                   |             |  |  |  |  |                                                                                                      |  |  |  |  |  |
|                                                                                    |  |                                                                                                   |             |  |  |  |  |                                                                                                      |  |  |  |  |  |
| Friday 5 June 2020                                                                 |  |                                                                                                   |             |  |  |  |  |                                                                                                      |  |  |  |  |  |
| Afternoon (Time: 2 hours)                                                          |  | Paper Reference <b>9PS0/02</b>                                                                    |             |  |  |  |  |                                                                                                      |  |  |  |  |  |
| <b>Psychology</b><br><b>Advanced</b><br><b>Paper 2: Applications of Psychology</b> |  |                                                                                                   |             |  |  |  |  |                                                                                                      |  |  |  |  |  |
| 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 in Section **A**. Answer ALL questions from **one** of the three options in Section **B**.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*

## Information

- The total mark for this paper is 90.
- 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.



**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  $U_a$  and  $U_b$ )

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

| $N_a$                                                                               | $N_b$ |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |
|-------------------------------------------------------------------------------------|-------|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
|                                                                                     | 5     | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15  | 16  | 17  | 18  | 19  | 20  |
| <b><math>p \leq 0.05</math> (one-tailed), <math>p \leq 0.10</math> (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 |



| $N_a$                                                                               | $N_b$ |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |
|-------------------------------------------------------------------------------------|-------|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|
|                                                                                     | 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> |       |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |
| <b>5</b>                                                                            | 1     | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14  | 15  | 16  |
| <b>6</b>                                                                            | 2     | 3  | 4  | 6  | 7  | 8  | 9  | 11 | 12 | 13 | 15 | 16 | 18 | 19  | 20  | 22  |
| <b>7</b>                                                                            | 3     | 4  | 6  | 7  | 9  | 11 | 12 | 14 | 16 | 17 | 19 | 21 | 23 | 24  | 26  | 28  |
| <b>8</b>                                                                            | 4     | 6  | 7  | 9  | 11 | 13 | 15 | 17 | 20 | 22 | 24 | 26 | 28 | 30  | 32  | 34  |
| <b>9</b>                                                                            | 5     | 7  | 9  | 11 | 14 | 16 | 18 | 21 | 23 | 26 | 28 | 31 | 33 | 36  | 38  | 40  |
| <b>10</b>                                                                           | 6     | 8  | 11 | 13 | 16 | 19 | 22 | 24 | 27 | 30 | 33 | 36 | 38 | 41  | 44  | 47  |
| <b>11</b>                                                                           | 7     | 9  | 12 | 15 | 18 | 22 | 25 | 28 | 31 | 34 | 37 | 41 | 44 | 47  | 50  | 53  |
| <b>12</b>                                                                           | 8     | 11 | 14 | 17 | 21 | 24 | 28 | 31 | 35 | 38 | 42 | 46 | 49 | 53  | 56  | 60  |
| <b>13</b>                                                                           | 9     | 12 | 16 | 20 | 23 | 27 | 31 | 35 | 39 | 43 | 47 | 51 | 55 | 59  | 63  | 67  |
| <b>14</b>                                                                           | 10    | 13 | 17 | 22 | 26 | 30 | 34 | 38 | 43 | 47 | 51 | 56 | 60 | 65  | 69  | 73  |
| <b>15</b>                                                                           | 11    | 15 | 19 | 24 | 28 | 33 | 37 | 42 | 47 | 51 | 56 | 61 | 66 | 70  | 75  | 80  |
| <b>16</b>                                                                           | 12    | 16 | 21 | 26 | 31 | 36 | 41 | 46 | 51 | 56 | 61 | 66 | 71 | 76  | 82  | 87  |
| <b>17</b>                                                                           | 13    | 18 | 23 | 28 | 33 | 38 | 44 | 49 | 55 | 60 | 66 | 71 | 77 | 82  | 88  | 93  |
| <b>18</b>                                                                           | 14    | 19 | 24 | 30 | 36 | 41 | 47 | 53 | 59 | 65 | 70 | 76 | 82 | 88  | 94  | 100 |
| <b>19</b>                                                                           | 15    | 20 | 26 | 32 | 38 | 44 | 50 | 56 | 63 | 69 | 75 | 82 | 88 | 94  | 101 | 107 |
| <b>20</b>                                                                           | 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> |       |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |
| <b>5</b>                                                                             | 2     | 3  | 5  | 6  | 7  | 8  | 9  | 11 | 12 | 13 | 14 | 15 | 17  | 18  | 19  | 20  |
| <b>6</b>                                                                             | 3     | 5  | 6  | 8  | 10 | 11 | 13 | 14 | 16 | 17 | 19 | 21 | 22  | 24  | 25  | 27  |
| <b>7</b>                                                                             | 5     | 6  | 8  | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28  | 30  | 32  | 34  |
| <b>8</b>                                                                             | 6     | 8  | 10 | 13 | 15 | 17 | 19 | 22 | 24 | 26 | 29 | 31 | 34  | 36  | 38  | 41  |
| <b>9</b>                                                                             | 7     | 10 | 12 | 15 | 17 | 20 | 23 | 26 | 28 | 31 | 34 | 37 | 39  | 42  | 45  | 48  |
| <b>10</b>                                                                            | 8     | 11 | 14 | 17 | 20 | 23 | 26 | 29 | 33 | 36 | 39 | 42 | 45  | 48  | 52  | 55  |
| <b>11</b>                                                                            | 9     | 13 | 16 | 19 | 23 | 26 | 30 | 33 | 37 | 40 | 44 | 47 | 51  | 55  | 58  | 62  |
| <b>12</b>                                                                            | 11    | 14 | 18 | 22 | 26 | 29 | 33 | 37 | 41 | 45 | 49 | 53 | 57  | 61  | 65  | 69  |
| <b>13</b>                                                                            | 12    | 16 | 20 | 24 | 28 | 33 | 37 | 41 | 45 | 50 | 54 | 59 | 63  | 67  | 72  | 76  |
| <b>14</b>                                                                            | 13    | 17 | 22 | 26 | 31 | 36 | 40 | 45 | 50 | 55 | 59 | 64 | 67  | 74  | 78  | 83  |
| <b>15</b>                                                                            | 14    | 19 | 24 | 29 | 34 | 39 | 44 | 49 | 54 | 59 | 64 | 70 | 75  | 80  | 85  | 90  |
| <b>16</b>                                                                            | 15    | 21 | 26 | 31 | 37 | 42 | 47 | 53 | 59 | 64 | 70 | 75 | 81  | 86  | 92  | 98  |
| <b>17</b>                                                                            | 17    | 22 | 28 | 34 | 39 | 45 | 51 | 57 | 63 | 67 | 75 | 81 | 87  | 93  | 99  | 105 |
| <b>18</b>                                                                            | 18    | 24 | 30 | 36 | 42 | 48 | 55 | 61 | 67 | 74 | 80 | 86 | 93  | 99  | 106 | 112 |
| <b>19</b>                                                                            | 19    | 25 | 32 | 38 | 45 | 52 | 58 | 65 | 72 | 78 | 85 | 92 | 99  | 106 | 113 | 119 |
| <b>20</b>                                                                            | 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  |
| <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.



### 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.



## SECTION A: CLINICAL PSYCHOLOGY

Answer ALL questions.

- 1 In your studies of clinical psychology you will have learned about schizophrenia.

Describe **three** features of schizophrenia.

1 Schizophrenia usually first appears between late adolescence and the mid-thirties, with males tending to develop it at a slightly earlier age than females.

2 People who develop psychosis before late adolescence often have a worse prognosis, with symptoms that are more severe and last longer than in those who develop it later on.

3 About 50% of people with schizophrenia have times when they have symptoms and times when they do not, so the disorder is often episodic, with periods of relapse and remission.

(Total for Question 1 = 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



- 2 Andi is a clinical psychologist who is investigating whether family relationships improve or deteriorate once a person has been diagnosed with a mental health disorder.

Andi is going to interview two separate groups.

- Group A: Patients and families waiting for a diagnosis of a mental health disorder.
- Group B: Patients and families who already have a diagnosis of a mental health disorder.

Andi carries out interviews with patients and their families. She uses both open questions and closed questions in her interviews.

- (a) Suggest **one** open question Andi may use in her interview about the influence of diagnosis on family relationships.

(1)

*"How has your relationship with your family changed since you, or your family member, were diagnosed with a mental health disorder?"*



- (b) Andi collated the data from her closed questions. Her results are shown in **Table 1**.

|                                   | Patient and family waiting for a diagnosis | Patient and family who already have a diagnosis |
|-----------------------------------|--------------------------------------------|-------------------------------------------------|
| Family relationships improved     | 10                                         | 25                                              |
| Family relationships deteriorated | 20                                         | 15                                              |

**Table 1**

Andi carried out a chi-squared test on her data.

State **two** reasons why Andi used the chi-squared test on her data.

(2)

- 1 *Andi was looking for a difference in family relationships between two separate (independent) groups: patients and families waiting for a diagnosis and those who already have a diagnosis.*
- 2 *Her data were nominal, as each patient and family was counted (a frequency) in a category: family relationships either improved or deteriorated.*

- (c) Andi found an observed / calculated value of 5.84 when  $df=1$  when she calculated the chi-squared test for her investigation.

Explain whether Andi's results were significant for a one-tailed (directional) hypothesis when  $p \leq 0.01$ .

(2)

*The critical value for a one-tailed test at  $p \leq 0.01$  when  $df=1$  is 5.02. Andi's observed value of 5.84 is greater than the critical value of 5.02, so her results are significant. This means there is a significant difference in the quality of family relationships between patients and families waiting for a diagnosis and those who already have a diagnosis, so Andi can reject her null hypothesis.*



(d) Andi carried out a thematic analysis on the data from the open questions.

Explain **one** strength and **one** weakness of thematic analysis as used by Andi.

(4)

Strength

Thematic analysis allows Andi to reduce the large amount of qualitative data from her open questions about family relationships after a diagnosis into a manageable number of themes, such as 'more support' or 'strain on the family'. This allows her to summarise the key findings so they are easily understood, for example by support groups who help families after a mental health diagnosis, while still keeping the depth of what patients and families said.

Weakness

Andi has to decide on and interpret the themes about family relationships herself, so her analysis is subjective and could be biased by her own expectations, for example that a diagnosis improves relationships. Therefore she may miss out themes that the patients or their families think are important, so her interpretation of the data may lack validity, and another researcher may identify different themes, lowering reliability.

(Total for Question 2 = 9 marks)



P 6 2 5 8 1 A 0 1 1 6 0

3 In your studies of clinical psychology you will have learned about Carlsson et al. (2000).

(a) State **two** aims of Carlsson et al. (2000).

(2)

1 *To see whether neurotransmitters other than dopamine, such as glutamate and serotonin, are implicated in causing schizophrenia.*

2 *To investigate the role that glutamate has in causing schizophrenia, including how glutamate interacts with dopamine, to help develop new antipsychotic drugs.*



(b) Carlsson et al. (2000) collected secondary data.

Explain **one** strength and **one** weakness of using secondary data in clinical psychology.

(4)

Strength

If a mental health disorder is uncommon it may be hard to find enough patients to carry out research for primary data. Using secondary data allows the findings of a lot of different studies about the disorder to be collated, as Carlsson et al. did by reviewing previous animal and human studies, which increases the size and diversity of the sample and so increases the generalisability of the conclusions. It is also quicker and cheaper than testing patients.

Weakness

The secondary data may include studies that used an old classification system, such as DSM-III, to diagnose the patients. Therefore the results may not be true of patients diagnosed using updated classification systems such as DSM-5 or ICD-11, so the conclusions may not be valid for mental health disorders at the present time. The researcher also has no control over how the original data were gathered, so cannot check its accuracy.

(Total for Question 3 = 6 marks)



- 4 Hector and his mother have schizophrenia. Hector has hallucinations and hears voices telling him what to do. He suffers from delusions, for example he thinks he is in charge of the country. Hector also has disordered thinking as he is unable to make connections between his thoughts.

His doctor believes that Hector's schizophrenia is caused by neurotransmitters, and has given him anti-psychotic medication to treat his schizophrenia.

Discuss the function of neurotransmitters as an explanation of Hector's schizophrenia.

You must make reference to the context in your answer.

(8)

*The original dopamine hypothesis states that schizophrenia is caused by an excess of dopamine in the brain, or by oversensitive dopamine receptors, which causes neurons to fire too often and send too many messages. This could explain Hector's symptoms, as the excess activity may lead to his hallucinations and delusions.*

*The revised dopamine hypothesis suggests that excess dopamine in the mesolimbic pathway, acting through D2 receptors, causes positive symptoms such as hallucinations and delusions. Hector hears voices telling him what to do and believes he is in charge of the country, so he may have excess dopamine activity in his mesolimbic system.*

*The revised hypothesis also suggests that a lack of dopamine in the prefrontal cortex, through reduced D1 receptor activation, leads to negative and cognitive symptoms such as poverty of speech. Hector has disordered thinking and cannot make connections between his thoughts, which may be due to low dopamine activity in his prefrontal cortex.*

*Carlsson et al. (2000) suggest that glutamate is also involved: if glutamate production is blocked, this can cause schizophrenia because it leads to an increase in the amount of dopamine in the brain. So Hector's symptoms may come from an imbalance between glutamate and dopamine, not from dopamine alone.*

*The anti-psychotic medication supports this explanation, as these drugs work by blocking dopamine D2 receptors, reducing dopamine activity. If Hector's medication reduces his hallucinations and delusions, this suggests his schizophrenia may be caused*



by excess dopamine. However, a treatment working does not prove the cause (treatment aetiology fallacy), and many patients still have negative symptoms on these drugs.

There are also alternative explanations. Hector's mother also has schizophrenia, so the genetic explanation may apply to him, as genes may be the cause of the neurotransmitter imbalance. Gottesman (1991) found that the risk is around 13% for a child with one parent with schizophrenia compared with 1% in the general population. However, Hector shares his environment with his mother, so stressful family interactions could also play a part.

Overall, neurotransmitters can explain Hector's positive symptoms and his disordered thinking well, and the success of his medication supports this, but it is unlikely to be the whole explanation, so a diathesis-stress approach including his genes and environment may explain his schizophrenia better.

(Total for Question 4 = 8 marks)



5 Assess the validity of diagnoses of mental health disorders through the use of classification systems.

(8)

In order to be valid, a classification system such as DSM-5 or ICD-11 must accurately diagnose the mental health disorder that a person really has, so that it leads to the right treatment for that disorder.

Concurrent validity is when a classification system comes up with the same diagnosis for the same symptoms at the same time as another classification system or measure.

Predictive validity is when, upon diagnosing a disorder, accurate predictions can be made about how the disorder will progress and how it will respond to treatment. For a system to be valid, the symptoms of each disorder have to be operationalised and measurable, for example social withdrawal for schizophrenia, so that clinicians know exactly what they are looking for.

Rosenhan (1973) found that hospital staff could not detect that his pseudo-patients, who claimed to hear voices saying 'empty', 'hollow' and 'thud', did not have a mental health disorder, and diagnosed most of them with schizophrenia. This suggests the classification system at the time was not valid. However, DSM-II was much less operationalised than current systems, so this study may not apply to diagnosis today.

Andrews et al. (1999) found that DSM-IV and ICD-10 had high agreement rates for disorders such as depression, which suggests the two systems have concurrent validity.

However, the systems were developed to be similar, so agreement may show that they share the same criteria rather than that the diagnosis is correct.

Powers et al. (2017) found that women who had suffered complex post-traumatic stress disorder, as defined in ICD-11, also had higher levels of alcohol and substance misuse, as predicted, showing that ICD-11 has good predictive validity.

On the other hand, many mental health disorders are co-morbid, such as depression and anxiety, so it may be hard for a clinician to accurately diagnose one disorder.



Symptoms also overlap between disorders, which makes it hard to operationalise the symptoms of one disorder, reducing validity. Culture can also bias diagnosis, as symptoms such as hearing voices may be normal in some cultures.

Overall, modern classification systems are more valid than in Rosenhan's time, as shown by evidence of concurrent and predictive validity, but co-morbidity and overlapping symptoms mean that diagnoses are still not always valid.

(Total for Question 5 = 8 marks)



6 In your studies of clinical psychology you will have learned about one of the following disorders:

- Anorexia nervosa
- Obsessive-compulsive disorder (OCD)
- Unipolar depression.

Evaluate **one** psychological treatment for your chosen disorder.

(20)

Chosen disorder *Unipolar depression*

*Cognitive behavioural therapy (CBT) is a psychological treatment for unipolar depression based on the idea that depression is caused by maladaptive, irrational thoughts, such as Beck's negative triad (negative views of the self, the world and the future), which then affect emotions and behaviour.*

*On the NHS, CBT for clients with depression often lasts for 6 to 12 sessions, with one or two sessions a week. At the beginning of the treatment the client is told how their thought patterns lead to their depression and behaviour, so they understand the process. The therapist listens to the client's core beliefs about themselves to understand what they are thinking and the processes involved. The client is taught to notice when they are thinking maladaptive thoughts, for example by keeping a thought diary, and the therapist challenges these thoughts by asking for evidence for and against them (reality testing).*

*The therapist then helps the client to work through more adaptive thoughts for given situations, which should reduce their depression. For example, a client may be taught that shouting at a child does not make them a bad parent, just a parent who may be tired at that point in time. Clients are given homework to do outside the sessions, such as carrying out an enjoyable task (behavioural activation), which also tests and challenges their negative thoughts.*

*There is research evidence that CBT is effective. Williams et al. (2013) found that*



cognitive bias modification for interpretation (CBM-I) combined with internet CBT

(iCBT) significantly reduced the symptoms of unipolar depression on all the measures they used, such as the BDI-II and PHQ-9, compared with a waiting list control group.

Ebert et al. (2015), in a review of 7 studies, found that computer-based CBT was effective for treating depression in children and adolescents. This suggests CBT can be delivered effectively online, which makes it more accessible.

However, not all evidence is positive. Shallcross et al. (2015) found that mindfulness-based cognitive therapy was no more effective at preventing relapse in clients with depression than an active control condition. Johnsen and Friberg (2015) carried out a meta-analysis and found that CBT is not as effective in the treatment of depression now as it was in the 1970s, when it was first used, perhaps because early studies used enthusiastic, expert therapists. This suggests the effectiveness of CBT may have been overestimated.

A strength of CBT is that it does not have physical side effects, unlike anti-depressants such as SSRIs, so it can be considered more ethical. It also aims to give the client the tools they need to reduce their depression, so they can use these skills in the future if further life events may lead to depression, which may reduce relapse compared with drugs, where symptoms often return when the medication stops. CBT can also be more cost effective than other therapies such as psychoanalysis, as it is relatively short and can be done in group sessions or on a computer. It is available free on the NHS, so it can be accessed by any patient, unlike other therapies which may only be accessed by those who can afford them. However, NHS waiting lists can be long and the number of sessions is limited, which may not be enough for severe depression.

On the other hand, people with unipolar depression may not have the energy or motivation to engage with CBT, such as completing homework tasks, so it may not be



useful without anti-depressants to start with. CBT also requires the patient to be able to express themselves and reflect on their thoughts, which patients with severe depression may not be able to do effectively. It is time consuming for the client, who has to attend weekly sessions as well as doing homework.

Another weakness is that CBT focuses on current maladaptive thought processes, so it ignores other factors that may have caused the depression, such as a traumatic childhood or ongoing problems such as poverty or an abusive relationship. If the causes of depression are biological, for example low serotonin, then CBT may not treat the cause, and anti-depressant medication may be more effective. It also places responsibility on the client to change their thinking, which may make them feel blamed if the therapy does not work.

In conclusion, CBT is an effective treatment for many people with unipolar depression, with no physical side effects and long-lasting skills that help prevent relapse, and it can be delivered cheaply in groups or online. However, its effectiveness depends on the motivation and ability of the client, it may be less effective than earlier studies claimed, and it does not address biological or social causes. Therefore it is probably most effective for mild to moderate depression, or when combined with anti-depressants for more severe depression, so that the client has enough energy to engage with the therapy.



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(Total for Question 6 = 20 marks)

**TOTAL FOR SECTION A = 54 MARKS**



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**SECTION B****Answer questions from ONE option in this section.****OPTION 1: CRIMINOLOGICAL PSYCHOLOGY****Answer ALL questions.****If you answer OPTION 1 put a cross in the box ☒ .**

- 7** During your studies in criminological psychology you will have carried out a practical investigation.

(a) State the aim of your practical investigation in criminological psychology.

(1)

*Our aim was to investigate whether weapon focus affects the accuracy of participants' recall of the perpetrator in a video of a crime.*

(b) Describe the procedure of your practical investigation in criminological psychology.

(4)

*First of all we picked two short videos for participants to watch, one of a crime where the perpetrator held a gun and one of the same crime without a weapon.*

*We picked our participants through opportunity sampling, and asked them to come to a classroom individually, where they were randomly allocated to watch one of the two videos (independent groups).*

*After they had watched the video of the crime they were given a distractor task, such as a word search, for 5 minutes so they could not rehearse what they had seen.*

*We then gave them a questionnaire about the crime, including questions that asked them to describe what the perpetrator had been wearing and what they looked like, and scored the number of correct details recalled out of 10. Finally we debriefed them.*

**(Total for Question 7 = 5 marks)**



- 8 Brie carried out an experiment to see the effect that labelling had on participants' perception of the probability of someone committing a crime. She selected her participants from students who were available in the refectory on one weekday during lunchtime.

She gave two separate groups of participants a different scenario to read.

- Condition A: the scenario stated that the person had already been involved in anti-social behaviour.
- Condition B: the scenario did not state anything about the person's previous behaviour.

Brie then asked the participants to rate how probable it was that the person in the scenario would commit a crime. A score of 7 was 'highly likely to commit a crime' and a score of 0 was 'highly unlikely to commit a crime'.

- (a) Identify the sampling technique used by Brie in her experiment.

(1)

*Brie used an opportunity sample, as she used students who were available in the refectory on one weekday at lunchtime.*



The results from the experiment carried out by Brie are shown in **Table 2**.

|                                                                                                              | <b>Condition A: the scenario stated that the person had already been involved in anti-social behaviour</b> | <b>Condition B: the scenario did not state anything about the person's previous behaviour</b> |
|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Mean score (out of 7) for the participants' perception of how likely the person was to commit a crime</b> | 5                                                                                                          | 3                                                                                             |

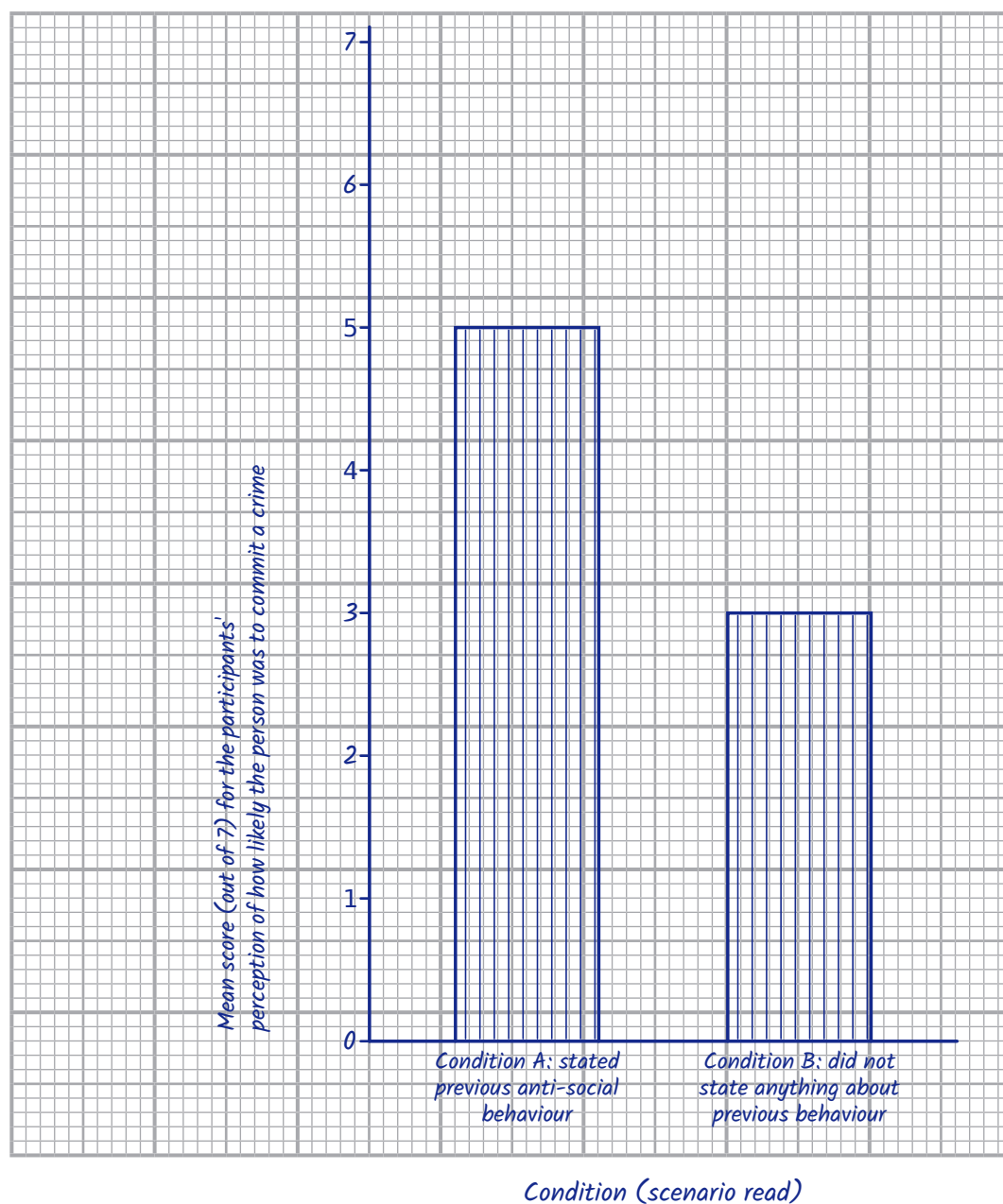
**Table 2**



(b) Draw a suitable graph to represent the results shown in **Table 2**.

(3)

Title *A bar chart to show the mean score (out of 7) for the participants' perception of how likely the person was to commit a crime in Condition A and Condition B*



(c) Brie used an independent groups experimental/research design.

Compare independent groups and matched pairs experimental/research designs as used in criminological psychology.

(3)

*Both independent groups and matched pairs designs have different participants in each condition of a study, such as a study into anti-social behaviour and criminality.*

*In matched pairs the researcher matches the participants (for example criminals) in each group on important characteristics, such as number of convictions or age, whilst in independent groups the participants in each group could have different characteristics, so participant variables are better controlled in matched pairs.*

*Both independent groups and matched pairs are less likely to have demand characteristics and order effects than repeated measures, as each participant only takes part in one condition, so they are less likely to guess the aim of a study into labelling and crime.*

(Total for Question 8 = 7 marks)



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- 9 Pat recently fell over and hit his head on a hard surface. As a result of the accident the doctors diagnosed him with a brain injury.

Pat has just been arrested for being involved in a fight, which witnesses say he caused. His friends no longer want to go out with him as he often gets into fights and recently threw an object at one of his own friends. He is also aggressive at home, shouting at family members and losing his temper quickly.

Discuss how far brain injury can account for the aggression shown by Pat.

You must make reference to the context in your answer.

(8)

*Brain injury may account for Pat's aggression. The frontal lobe, especially the prefrontal cortex, controls impulses and higher-order thinking. If Pat hit the front of his head when he fell, he may have damaged his frontal lobe, so he has less control over his aggressive impulses, which may explain why he started a fight and has been arrested.*

*Damage to the frontal lobe also negatively affects our ability to consider alternative behaviours and to think about the possible consequences of aggression. This explains why Pat throws objects at his own friends without thinking about the fact that he may lose them, and his friends no longer want to go out with him.*

*The amygdala is part of the limbic system and is involved in emotions such as fear and anger. Damage to the amygdala, or to the connections between it and the prefrontal cortex, can lead to less control over aggressive emotional impulses. Pat may have damaged his amygdala, which is why he loses his temper quickly and shouts at his family members.*

*This is supported by the case of Phineas Gage, who became impulsive and aggressive after an iron rod damaged his frontal lobe, and by Raine et al. (1997), who found reduced activity in the prefrontal cortex of murderers compared with controls. Pat's aggression started after his accident, which suggests his brain injury is the cause.*

*However, other explanations could also account for Pat's aggression. According to Eysenck's personality theory, if someone scores high on extraversion, neuroticism and psychoticism they may be prone to violence. If Pat is a high extravert he may have an*



underactive reticular activating system (RAS), so he shouts at his family and gets into fights to seek external stimulation. Social learning could also play a part if Pat has seen others being rewarded for aggression.

In conclusion, as Pat's aggression appears at home and with friends and followed his head injury, brain injury can account for much of his behaviour, but not all people with frontal lobe damage become aggressive, so his personality and environment may also play a part.

(Total for Question 9 = 8 marks)



- 10 Cassandra is on trial for a recent case of burglary. She is 24 years old, white, of slim build and considered to be attractive. Her lawyer advises her to dress in a smart suit for the trial to make a good impression on the jury. She has a strong local accent, which is considered to be an unpopular accent.

The trial is taking place over 100 miles away from Cassandra's home town, as this is where the alleged burglary took place.

To what extent may Cassandra's characteristics affect the jury's decision-making in her trial?

You must make reference to the context in your answer.

(16)

*Characteristics of the defendant, such as race, attractiveness, clothing and accent, may influence the jury's decision because jurors use schemas and stereotypes rather than only considering the evidence.*

*Race may affect jury decision-making. If the jury is mainly white, they are more likely to find people of a different race guilty, because, according to social identity theory, white jurors may see themselves as the in-group and discriminate against defendants of another race as they are the out-group. Cassandra is white, so if the jury is also mainly white, she will be seen as part of their in-group and they may be less likely to find her guilty of the burglary.*

*Carter and Mazzula (2013) used 210 mock jurors and found in-group and out-group bias when jurors decided on the outcome of an employment case, showing that race does affect the jury and their decision-making. However, the use of mock juries is not valid, as the jurors know there are no real consequences of their decision, so in Cassandra's real trial her race may not affect the jury's decision as much.*

*Attractiveness also affects jury decisions: the more attractive a defendant is, the less likely they are to be found guilty, apart from crimes such as fraud where they may have used their looks. Juries may use schemas from the media, which often portrays attractive people as the heroes and unattractive people as the villains (the halo effect). As Cassandra is young, slim and considered attractive, and is wearing a smart suit, the*



jury may see her as more trustworthy and less likely to have committed the burglary, so may not find her guilty.

Sigall and Ostrove (1975) found that an attractive defendant was given a more lenient sentence for burglary than an unattractive one, but a harsher sentence for a swindle, which supports the idea that Cassandra may be treated leniently for burglary. Schvey et al. (2013) found that obese female defendants were judged more harshly by male jurors than slim female defendants, showing that appearance does affect the decision-making of a jury. However, Schvey et al. only found this with male jurors, so attractiveness may not affect the decision if Cassandra's jury is mainly female, which limits the extent to which her appearance matters.

Accent can also influence the jury, and an unpopular accent makes it more likely that the defendant will be found guilty. The further away a trial is from the place the accent comes from, the more negative its influence on the jury. Cassandra has a strong, unpopular local accent and her trial is over 100 miles from her home town, so the jurors are unlikely to share her accent and may see her as a member of an out-group, making them more likely to find her guilty. Dixon et al. (2002) found that participants rated a suspect with a strong Birmingham accent as more guilty than one with a standard English accent, especially for a blue-collar crime such as armed robbery, which is similar to burglary. However, this study used an audio recording rather than a full trial, so it lacks ecological validity.

Other factors may also reduce the effect of Cassandra's characteristics. The strength of the evidence, such as witnesses or fingerprints, is likely to have a much greater influence than her appearance, and the judge's instructions to consider only the evidence may reduce the influence of her characteristics. Jurors also discuss the case during deliberation, so individual biases may be challenged by other jurors.

In conclusion, Cassandra's characteristics may affect the jury to a large extent but in



different directions: her race, attractiveness and smart clothing may make the jury less likely to find her guilty, whereas her unpopular accent, far from home, may make them more likely to find her guilty. However, as most research uses mock juries and the evidence presented is likely to be most important, the extent to which her characteristics affect the final verdict may be limited.



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(Total for Question 10 = 16 marks)

**TOTAL FOR SECTION B OPTION 1 = 36 MARKS**



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## OPTION 2: CHILD PSYCHOLOGY

Answer ALL questions.

If you answer OPTION 2 put a cross in the box ☒.

11 During your studies in child psychology you will have carried out a practical investigation.

(a) State the aim of your practical investigation in child psychology.

(1)

*Our aim was to investigate whether parents think that boys and girls should play with different types of toys.*

(b) Describe the procedure of your practical investigation in child psychology.

(4)

*We decided to use a questionnaire using closed questions such as 'Is a doll a suitable toy for a boy? Yes or no', and some open questions asking parents to explain their views.*

*Once we had devised our questionnaire, we gave it out to an opportunity sample of 20 parents who had children aged between 4 and 7 at a local primary school, with a standardised brief and the right to withdraw.*

*Before analysing, we decided which would be typical girls' toys, such as a doll, and typical boys' toys, such as cars, and created a tally chart.*

*Once we had collected all the questionnaires we noted how many parents had said yes and no to typical girls' and boys' toys for each sex in our tally chart, and carried out a chi-squared test.*

(Total for Question 11 = 5 marks)

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- 12** Brie carried out an observation to see the effects of day care on one-year-olds' reactions to their mother leaving the room. She selected her participants from those who were available at a local day care centre one Monday.

She had two groups of one-year-old children.

- Condition A: the one-year-olds spent less than 15 hours a week in day care.
- Condition B: the one-year-olds spent over 30 hours a week in day care.

She set up a playroom and asked the mothers to play with their child for five minutes and then leave the room. Brie then rated the level of crying of the one-year-olds. A score of 7 was 'intense crying' and a score of 0 was 'no crying at all'.

- (a) Identify the sampling technique used by Brie in her investigation.

(1)

*Brie used an opportunity sample, as she used mothers and one-year-olds who were available at the local day care centre that Monday.*

The results from the observation carried out by Brie are shown in **Table 3**.

|                                                               | <b>Condition A: the one-year-olds spent less than 15 hours a week in day care</b> | <b>Condition B: the one-year-olds spent more than 30 hours a week in day care</b> |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| <b>Mean score (out of 7) for the intensity of the crying.</b> | 5                                                                                 | 3                                                                                 |

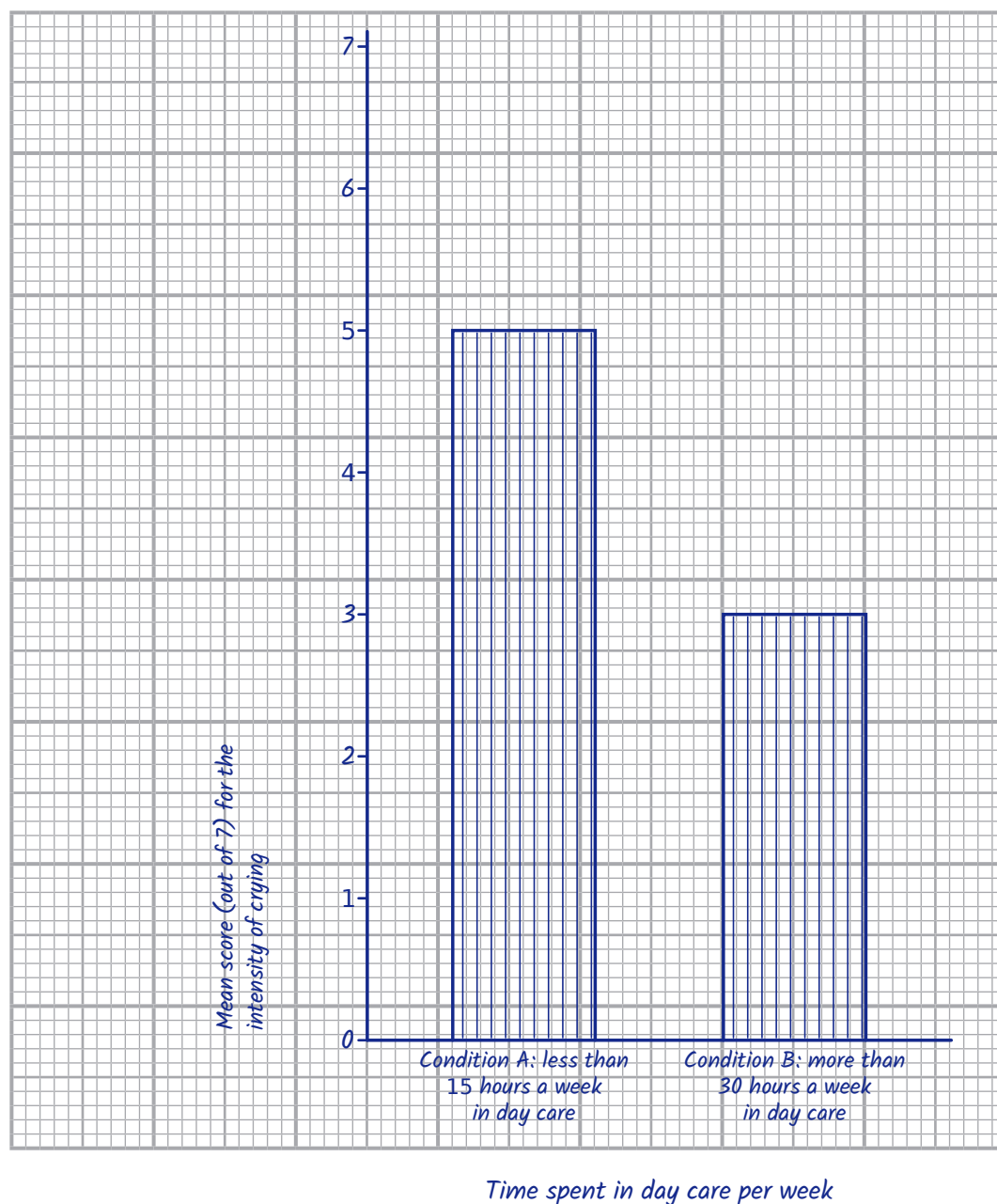
**Table 3**



(b) Draw a suitable graph to represent the results shown in **Table 3**.

(3)

Title *A bar chart to show the mean score (out of 7) for the intensity of crying when the mother leaves for one-year-olds in day care for under 15 or over 30 hours a week*



(c) Brie used an independent groups experimental/research design.

Compare independent groups and matched pairs experimental/research designs as used in child psychology.

(3)

*Both independent groups and matched pairs designs have different children in each condition of a study into development, such as one-year-olds in day care.*

*In matched pairs the researcher matches the children in each group on important characteristics, such as age, temperament or time in day care, whilst in independent groups the children in each group could have different characteristics, so participant variables are better controlled in matched pairs.*

*Both independent groups and matched pairs are less likely to have demand characteristics and order effects than repeated measures, as each child only takes part in one condition, so they will not get used to the separation procedure in a study into development.*

(Total for Question 12 = 7 marks)



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**13** Pat has recently been diagnosed as having autism. He has trouble making friends as he often gets into arguments about other children breaking the rules of games. He also finds it difficult to communicate with other people as he finds it hard to interpret their facial expressions. Pat does not like playing imaginative games with his brother, who does not have autism, as he finds it hard to imagine a cardboard box is a ship.

His parents have read an article that suggests that the causes of autism are biological.

Discuss how far **one** other explanation can account for Pat's autism.

You must make reference to the context in your answer.

(8)

*One cognitive explanation for autism is the theory of mind (ToM) explanation, which states that a person with autism cannot understand that other people have their own thoughts, beliefs and intentions, so they cannot understand another person's point of view (mind blindness).*

*Pat cannot understand his brother's point of view when they play imaginative games, so he finds it hard to understand why his brother says the cardboard box is a ship, because he cannot imagine what is in his brother's mind.*

*The theory of mind explanation also says that children with autism do not understand other people's facial expressions, so they have difficulty understanding non-verbal communication. This explains why Pat finds it hard to communicate and make friends, as he cannot read what emotions the other children's faces are showing.*

*Baron-Cohen's empathising-systemising theory (extreme male brain) suggests that people with autism are high systemisers, so they use rules to organise internal and external events. As Pat may be a high systemiser, this explains why he gets into arguments with other children when he thinks they have broken the rules of the game.*

*There is evidence for this explanation. Baron-Cohen et al. (1985) found that 80% of autistic children failed the Sally-Anne false belief task, compared with only 15% of typically developing children and 14% of children with Down syndrome, suggesting a specific deficit in theory of mind. Baron-Cohen et al. (1997) found that adults with autism were worse at judging emotions from photographs of the eyes.*



However, theory of mind does not explain all features of autism, such as repetitive behaviours, and some people with autism can pass false belief tasks. The biological explanation suggests that a variety of genes interact to cause autism, and Pat may have these genes whilst his brother does not, which would explain why his brother does not have autism. Twin studies show high concordance for autism in identical twins.

In conclusion, theory of mind can account well for Pat's social, communication and imagination difficulties, but it describes the problem rather than explaining what causes the deficit, so it is likely to work alongside biological causes.

(Total for Question 13 = 8 marks)



- 14 Cassandra has twin boys, Alexander and Julius, who attend day care. Cassandra has noticed that the boys react differently when she picks them up from day care; Alexander is happy to see her whilst Julius ignores her.

Alexander has many friends at day care who he plays word games with unlike Julius who often plays on his own. Alexander is more cognitively advanced for his age than his brother as he is starting to recognise letters whereas Julius cannot.

Assess the effects of day care on the development of Alexander and Julius.

You must make reference to the context in your answer.

(16)

Day care is temporary care of children by people other than their parents, such as at a nursery, and it may affect children's attachment, social and cognitive development.

Day care can affect attachment styles, as children who spend more time in day care may develop insecure attachments because of repeated separations from their mother. A child in day care may become anxious-avoidant, so they are not affected by the absence or return of their mother. Julius may have developed an anxious-avoidant attachment to Cassandra, as he ignores her when she picks him up from day care. In contrast, Alexander seems to have developed a secure attachment, as he is happy to see her when she returns.

Belsky and Rovine (1988) found that infants who spent more than 20 hours a week in day care in their first year were more likely to develop an insecure attachment to their mother, showing that day care can have a negative effect on development.

However, they used the Strange Situation, and children used to day care may be used to separations, so they may seem avoidant simply because they are independent. Also, Alexander and Julius both go to day care, so day care alone cannot explain why only Julius ignores his mother. It could be the temperament of the child that affects the attachment, so being in day care may not be the cause of Julius' behaviour.

One benefit of day care is that children socialise more, so they find it easier to make friends when they go to school. Children in day care have to learn to share toys and interact with each other, which helps them understand social rules. Day care has helped



Alexander develop socially, as he has many friends who he plays word games with.

Andersson (1992) found that children who attended day care in Sweden had more friends and were more outgoing at school than children who did not attend day care, showing a positive effect on social development.

However, Andersson carried out his study in Sweden, which has high quality day care, and the children who attended it at an earlier age came from higher income families, so it may be the socio-economic status of the family, not day care, that affected their development. Julius plays on his own at the same day care, which suggests that individual differences, such as a shy temperament, are also important.

Day care in the United Kingdom provides experiences that enhance a child's cognitive development, such as number and word games, and Ofsted inspects providers, who must follow a formal curriculum (the Early Years Foundation Stage). The time Alexander spends playing word games has helped him develop cognitively, as he is starting to recognise letters earlier than Julius. The EPPE project (Sylva et al., 2004) found that children who attended day care before the age of 3 had better intellectual development, especially in high quality settings.

However, the EPPE project also found that the amount of time spent in day care per week made no difference to the intellectual benefits, so other factors may influence development. Julius gets the same day care as Alexander but cannot recognise letters, which suggests that differences in their individual abilities, interests or interactions with staff matter more than day care itself.

In conclusion, day care can have both positive and negative effects on children's development: it may have helped Alexander's social and cognitive development, and it may have contributed to Julius' avoidant behaviour if he spends long hours there.

However, because the twins attend the same day care but develop differently, factors such as temperament, quality of care and the time and type of interaction with staff



and their mother are likely to be just as important as day care itself.

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(Total for Question 14 = 16 marks)

**TOTAL FOR SECTION B OPTION 2 = 36 MARKS**



### OPTION 3: HEALTH PSYCHOLOGY

Answer ALL questions.

If you answer OPTION 3 put a cross in the box ☒.

**15** During your studies in health psychology you will have carried out a practical investigation.

(a) State the aim of your practical investigation in health psychology.

(1)

*Our aim was to investigate whether modern pop songs reference drugs in a positive or negative manner.*

(b) Describe the procedure of your practical investigation in health psychology.

(4)

*We decided to pick the songs that were at numbers 1 to 40 in the UK and US charts in the week we planned our content analysis.*

*As a group we printed the lyrics to each of the forty songs and noted down any references to drugs, including alcohol, and what exactly those references were.*

*Once we had all the references to drugs, we decided what the most common themes were and put them in a tally chart under positive and negative.*

*We then watched the music videos to check that the references were drug related, and two of us coded the songs separately to check inter-rater reliability.*

(Total for Question 15 = 5 marks)

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**16** Brie carried out an experiment to see the effect of a new drug for treating heroin addiction. The new drug was developed to reduce the impact of withdrawal symptoms. She selected heroin addicts from those who were available at a local rehabilitation centre one Monday.

She compared two groups of heroin addicts.

- Condition A: the heroin addicts who were not given the new drug.
- Condition B: the heroin addicts who were given the new drug.

Brie then asked the heroin addicts to rate the intensity of their withdrawal symptoms. A score of 7 was 'high intensity of withdrawal symptoms' and a score of 0 was 'low intensity of withdrawal symptoms'.

(a) Identify the sampling technique used by Brie in her experiment.

(1)

*Brie used an opportunity sample, as she used heroin addicts who were available at the local rehabilitation centre that Monday.*

The results from the experiment carried out by Brie are shown in **Table 4**.

|                                                                            | <b>Condition A: the heroin addicts who were not given the new drug</b> | <b>Condition B: the heroin addicts who were given the new drug</b> |
|----------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------|
| <b>Mean score (out of 7) for the intensity of the withdrawal symptoms.</b> | 5                                                                      | 3                                                                  |

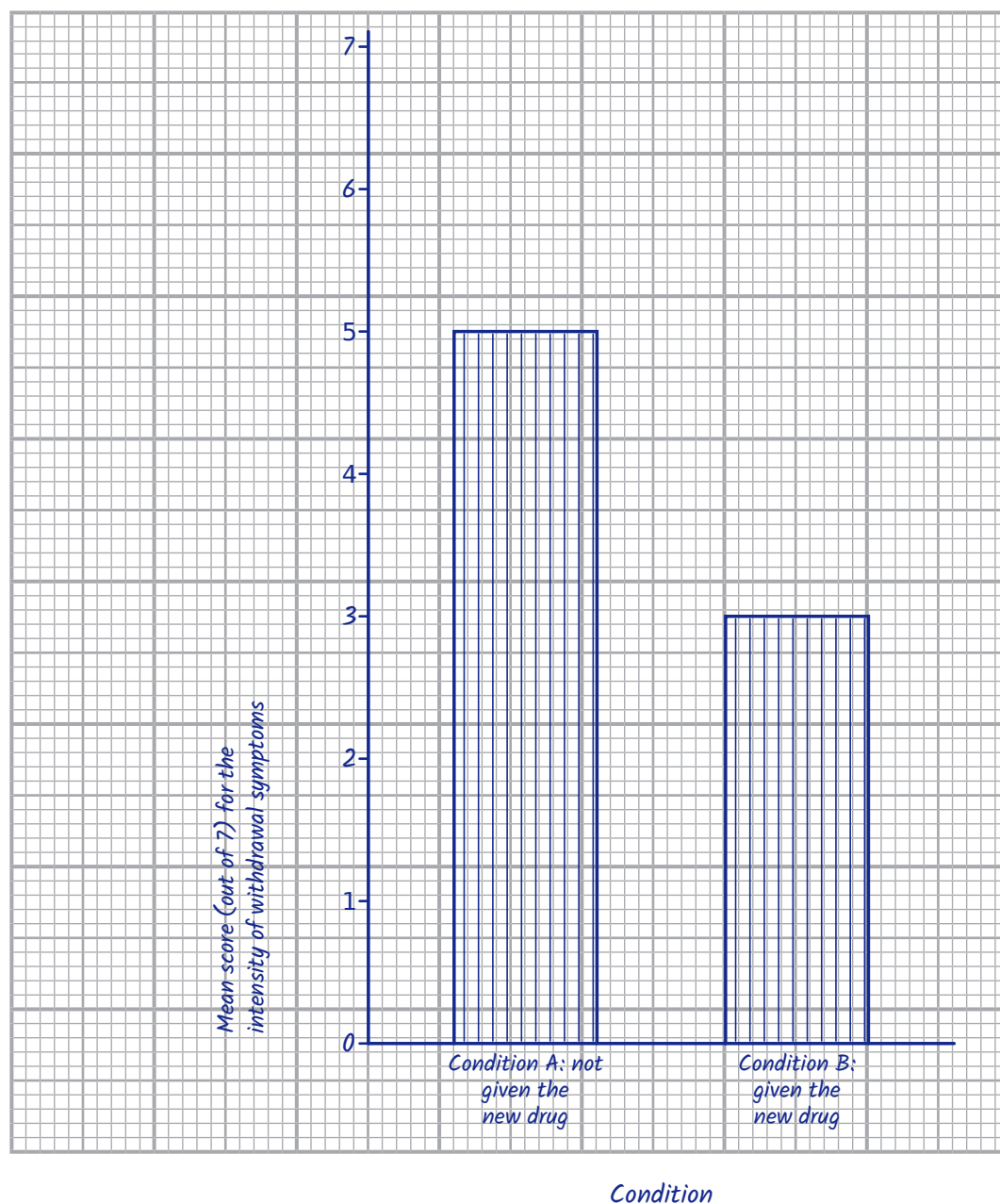
**Table 4**



(b) Draw a suitable graph to represent the results shown in **Table 4**.

(3)

Title *A bar chart to show the mean score (out of 7) for the intensity of withdrawal symptoms in heroin addicts who were not given or were given the new drug*



(c) Brie used an independent groups experimental/research design.

Compare independent groups and matched pairs experimental/research designs as used in health psychology.

(3)

*Both independent groups and matched pairs designs would have different heroin addicts in each condition of a study into drugs, such as testing the new drug.*

*In matched pairs the researcher matches the addicts in each group on important characteristics, such as length of addiction or amount of heroin used, whilst in independent groups the addicts in each group could have different characteristics, so participant variables are better controlled in matched pairs.*

*Both independent groups and matched pairs are less likely to have demand characteristics and order effects than repeated measures, as the addicts only take part in one condition, so they are less likely to guess the aim of a study into drug treatment.*

(Total for Question 16 = 7 marks)



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17 Pat is addicted to alcohol and so is his father. When Pat was a child he saw his father drink alcohol. His father was often in a bad mood until he had his first alcoholic drink.

When Pat drinks alcohol he feels more relaxed and calm. He often has a drink after his evening meal, and now wants a drink every time he has his evening meal. He can now drink a lot of alcohol without feeling the effects.

Pat also drinks when he is out with his friends who praise the person that can drink the most alcohol. If Pat does not have a drink during the day he feels ill.

Discuss how far **one** learning explanation can account for Pat's addiction to alcohol.

You must make reference to the context in your answer.

(8)

*Operant conditioning (Skinner) states that behaviour is learned through its consequences. If a person is reinforced for a behaviour, they are more likely to repeat it, and if they are punished, they are less likely to repeat it.*

*Alcohol acts as a positive reinforcement because it makes people feel more relaxed and lowers their inhibitions. When Pat drinks alcohol he feels more relaxed and calm, which is a pleasant consequence, so he is more likely to drink again.*

*Pat is also positively reinforced socially, as his friends praise the person who can drink the most alcohol. This praise rewards Pat's heavy drinking, so he will repeat the behaviour and drink more when he is out with his friends.*

*Withdrawal symptoms from alcohol are unpleasant, such as headaches and shaking, so they act as a punishment for not drinking. When Pat does not have a drink during the day he feels ill, and drinking alcohol gets rid of these unpleasant withdrawal symptoms, so drinking is negatively reinforced, which maintains his addiction.*

*A strength of operant conditioning is that it explains why addiction is maintained, as positive reinforcement explains why Pat continues to drink, and negative reinforcement explains why it is hard for him to stop. It has also led to successful treatments such as contingency management, where addicts are rewarded with vouchers for staying abstinent, which supports reinforcement as a cause of addiction.*

*However, operant conditioning cannot fully explain why Pat started drinking. Social*



learning theory may explain this better, as Pat saw his father drink as a child and saw that his father's bad mood improved after his first drink, so he was vicariously reinforced. Classical conditioning may explain why Pat wants a drink every time he has his evening meal, as he has associated the meal with alcohol. Pat's father is also addicted, so a biological explanation such as genes could explain his tolerance, as he can now drink a lot without feeling the effects.

In conclusion, operant conditioning can account for a lot of Pat's addiction, especially why it is maintained, but it is not a complete explanation, as social learning, classical conditioning and biological factors also play a part.

Total for Question 17 = 8 marks)



- 18 Cassandra is addicted to nicotine, and smokes over 30 cigarettes a day. When she smokes a cigarette Cassandra feels the effects almost immediately. She sometimes feels more alert, and sometimes feels more relaxed. She also feels happier and finds her memory improves after smoking a cigarette.

When she started smoking cigarettes Cassandra only had around five cigarettes a day, but this quickly increased as she found that the cigarettes were not having as much effect.

To what extent can **one** biological explanation account for Cassandra's addiction to nicotine?

You must make reference to the context in your answer.

(16)

*One biological explanation of nicotine addiction is the neurotransmitter explanation.*

*When a cigarette is smoked, nicotine goes from the lungs into the bloodstream and reaches the brain within a few seconds. This explains why Cassandra feels the effects of a cigarette almost immediately.*

*Nicotine molecules are a similar shape to acetylcholine (ACh) molecules, so nicotine binds to nicotinic ACh receptors in the brain. After nicotine attaches to the ACh receptors, it makes the neuron fire more frequently, which leads to feelings of alertness. This explains why Cassandra sometimes feels more alert after smoking. The excess ACh activity also increases norepinephrine (noradrenaline) levels, leading to better memory functioning, which explains why Cassandra finds that her memory improves after smoking.*

*Nicotine also increases the release of dopamine in the mesolimbic reward pathway (the ventral tegmental area to the nucleus accumbens), leading to feelings of pleasure.*

*Cassandra feels happier after smoking because the nicotine has increased dopamine in the reward pathway in her brain. The smoke from cigarettes may also decrease the level of monoamine oxidase (MAO), which means dopamine is not broken down as quickly, so it has a greater effect on the reward system. Nicotine also stimulates the release of other neurotransmitters such as serotonin and endorphins, which may explain why she sometimes feels relaxed.*



With repeated smoking, the brain adapts to the high levels of neurotransmitter activity by adjusting its own natural production and the number and sensitivity of the receptors, so more nicotine is needed for the same effect (tolerance). When Cassandra started smoking she had around five cigarettes a day, but this quickly increased to over 30 a day because the cigarettes were not having as much effect, as her brain had become used to the nicotine. Without nicotine, dopamine levels fall and withdrawal symptoms occur, so she smokes to avoid them.

There is research evidence for this explanation. Kenny and Markou (2006) found that rats that self-administered nicotine had increased sensitivity of their brain reward systems, suggesting that nicotine does increase dopamine activity and lead to addiction. Brunzell et al. (2010) found that rats with specific nicotine-sensitive ACh receptors self-administered nicotine more than rats without these receptors, showing that neurotransmitter receptors affect whether people become addicted to nicotine. Markou et al. (1998) found a significant decrease in the activity of the brain reward pathway in rats when they were withdrawn from nicotine, so neurotransmitters can effectively explain the withdrawal symptoms experienced by smokers.

However, much of this research uses animals, and there are biological and cognitive differences between rats and humans, so the findings may not explain how nicotine affects Cassandra's brain or why humans become addicted. The neurotransmitter explanation also cannot explain why people smoke their first cigarette, as the person has not yet experienced the effects of nicotine, so it is not effective in explaining how addiction starts. Social factors, such as peer pressure, or role models who smoke may better explain why Cassandra started smoking.

There are also alternative explanations. The genetic explanation suggests some people inherit a vulnerability to nicotine addiction, for example through genes that affect dopamine or nicotine metabolism, and twin studies such as Vink et al. (2005) found



that a large proportion of the variation in smoking is heritable. Learning explanations suggest that the pleasurable effects of the dopamine reward pathway act as positive reinforcement, and removing withdrawal acts as negative reinforcement, so the biological explanation may not be a complete explanation on its own. It is also reductionist, as it ignores cues such as smoking with coffee or with friends that can trigger cravings.

In conclusion, the neurotransmitter explanation can account to a large extent for Cassandra's addiction, as it explains why she feels the effects immediately, why she feels alert, happier and has a better memory, and why her tolerance increased.

However, it cannot explain why she started smoking and is largely based on animal research, so a biopsychosocial approach combining biological, learning and social factors is likely to give a more complete explanation.



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(Total for Question 18 = 16 marks)

**TOTAL FOR SECTION B OPTION 3 = 36 MARKS**

**TOTAL FOR PAPER = 90 MARKS**



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