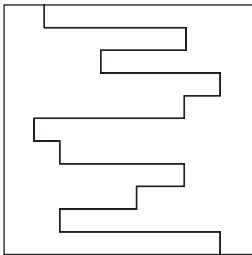This page is intentionally left blank

Answers and Explanations
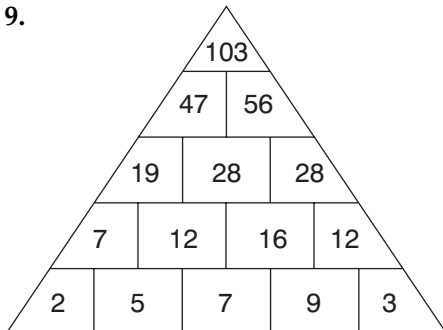
Test One: Answers

1. B;

2. allow;   **3.** 20: add 1, 1, 2, 2, 3, 3, 4, 4;   **4.** 3527: in the others the sum of the first two numbers is equal to the sum of the second two numbers, for example 5 + 2 = 6 + 1;
5. pressure;   **6.** D: lines across proceed +1, +2, +3. Lines down proceed +3, +2, +1;
7. C: in all the others the black circle is connected to three white circles. In C it is only connected to two white circles;   **8.** weight, speed;

9.

10. B: the rest are the same figure rotated;   **11.** 44 minutes: 12 noon less 44 minutes = 11.16, 11.16 less 48 minutes = 10.28, 9 am plus 88 minutes (44 × 2) = 10.28;   **12.** SHIVER, EROTIC, ICICLE, LENGTH, THRASH;   **13.** cube: it is a three-dimensional figure. The rest are all two-dimensional figures;   **14.** Switch A is faulty;   **15.** B: in each line and column, each of the three rings is shaded black once;   **16.** impact;   **17.** WIN BOAR = rainbow. The foods are spaghetti (PAST EIGHT), macaroni (I CAN ROAM), pancake (CAN PEAK) and chocolate (COOL CHEAT);   **18.** 4: looking across at the three circles, the number in the middle is the product of the two numbers in the same segment in the other two circles. Thus, 3 × 2 = 6, 7 × 3 = 21 and 4 × 4 = 16;   **19.** PROFESSIONAL;   **20.** 11;   **21.** D: in each line across and down the arrows point in each of three directions left, right and down. The number of arrows increases 1, 2, 3 in each row;   **22.** $5\frac{1}{16}$: there are two alternate sequences: $-1\frac{1}{4}$ and $+1\frac{1}{4}$;   **23.** linguist, polyglot;   **24.** 888, 890: the sequence progresses ×3, +2;   **25.** take: all words can be prefixed with PAR to form another word – parable, parrot, parson, parking, partake;   **26.** swimmer, skier;   **27.** place/pace;   **28.** Alf 144, Jim 36, Sid 12;   **29.** sexed Utah = exhausted. The words meaning out of this world are: wonderful (flow under), unbelievable (enviable blue), incredible (icier blend);   **30.** 40 socks. If he takes out 38 socks, although it is very unlikely, it is possible they could all be blue and red. To make 100 per cent certain that he also has a pair of black socks he must take out a further two socks;

31.

The black dot is moving up (then down) by one position at each stage;

32. 37 minutes: 12 noon less 37 minutes = 11.23, 11.23 less nine minutes = 11.14. 10 am plus 74 minutes (2 × 37) = 11.14;   **33.** medley, conglomeration;   **34.** evil: when joined together each pair of words forms another word – brokerage, prosecute, daredevil;   **35.** 93541;   **36.** D: so that one dot appears in the triangle and one circle; and the other dot appears in the triangle and three circles;   **37.** HANG GLIDER;   **38.** G;   **39.** 0: looking at lines of numbers from the top: 9 × 8 = 72; 72 × 8 = 576; 576 × 8 = 4608;   **40.** C: each opposite corner block of four squares are identical.

Test Two: Answers

1. E: the number of white dots is increased by one each time, both vertically and horizontally, and all white dots are connected;   **2.** PART: RAMPART and PARTRIDGE;   **3.** B: lines across proceed +2, –3, +2. Lines down proceed –3, +2, –3;   **4.** glass;   **5.** 5: (8 + 7) × 5 = 75;   **6.** fact is stranger than fiction;   **7.** B: black objects turn to white and vice versa;   **8.** 7.5: the sequence proceeds +4, ÷2, +4, etc;   **9.** meridian, parallel;   **10.** B: in lines and columns, add the first three numbers to arrive at the fourth number;   **11.** observe;

12.
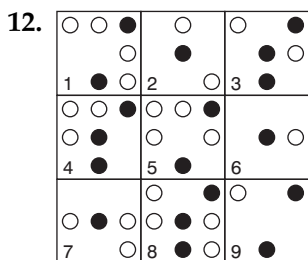
Tile 7 is incorrect, and should be replaced by tile B;

13. frivolity, sobriety;

14.
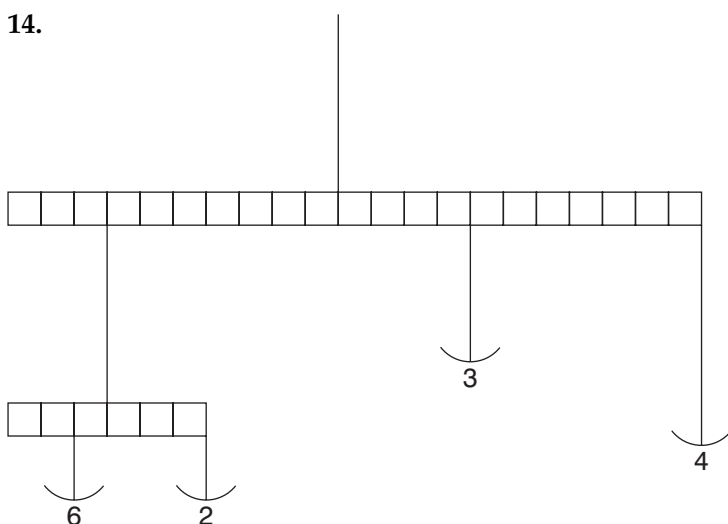
6 × 1 = 2 × 3: 7 × 8 (6 + 2) = 56, 11 × 4 = 44, 4 × 3 = 12, 44 + 12 = 56;

15. weigh hay;   **16.** D;   **17.** mandible: it is the jaw bone, the rest are bones in the leg;
18. 10 pm: 12 noon = 12 noon, 1 pm = 12.43, 2 pm = 1.26, 3 pm = 2.09, 4 pm = 2.52,
+6 hours = 10 pm;   **19.** OPTICAL ILLUSION;   **20.** A: each line across and down
contains five black dots and four white dots;   **21.** A: the figure is tumbling 45° at
each stage and alternates white/black/striped;   **22.** crossfire: all words contain an
embedded tree – do(pine)ss, uncl(oak)ing, dishw(ash)er, cross(fir)e;   **23.** 57: there
are two alternate sequences: +14, –97;   **24.** C;   **25.** 27, 9, 12: the sequence progresses
÷3, +3, ×3, –3 repeated;   **26.** D: it contains a triangle in a circle, a circle in a triangle
(with the same orientation of the triangle) and a black dot in a square;
27. minimum;   **28.** 7: 91 ÷ 13;   **29.** Switch D is faulty;   **30.** coalesce;   **31.** 17: it is the
sum of the two digits (9 + 8) in the quadrant directly opposite;   **32.** E: so that the dot
appears in two circles and the square;   **33.** 32: the next cube number below 64 (4 × 4
× 4) is 27 (3 × 3 × 3). In order to construct a solid cube, therefore, with none left over, 59
– 27 = 32 blocks need to be taken away;   **34.** DERIVE/DRIVE;   **35.** 49: (73 + 25) ÷ 2;

36. COMPUTE;   **37.** D: the last two rows of figures repeat the first two rows of figures in reverse;   **38.** MEDIOCRE, SUPERIOR;   **39.** 8: each number in the segment at the bottom is the sum of the four numbers in the sections either side. Thus: 8 + 3 + 4 + 3 = 18;   **40.** E.

Test Three: Answers

1. E: only lines that appear three times in the same position in the first three squares are carried forward to the final square;   **2.** trombone: the rest are percussion instruments;   **3.** head of school = principal, fundamental truth = principle, standing still = stationary, writing materials = stationery, smaller in amount = less, smaller in number = fewer (score 1 point if all answers are correct);   **4.** 683: in the other numbers add the first and last digits to arrive at the middle digit;   **5.** PAST, FUTURE;   **6.** L;   **7.** D: to each arc, add a quarter of a circle clockwise;   **8.** ESCALATE, HEIGHTEN;   **9.** 30, 26: there are two alternate sequences. Add 5 starting at 1. Subtract 5 starting at 50;   **10.** acellular, acerbated, acerbates, acescence, acescency, acetabula, acetamide, acetified;   **11.** D;   **12.** B: start at the bottom left-hand corner square and work along the bottom row, then back along the next row up etc, repeating the numbers 38219;   **13.** government;   **14.** E: each line across and down contains one each of the three symbols. In each line one symbol is black, and one is upside down;   **15.** PAMPHLET, BROCHURE;

**16.** VHU: the numbers spelled out below are the number of sides in the figures in which they appear;
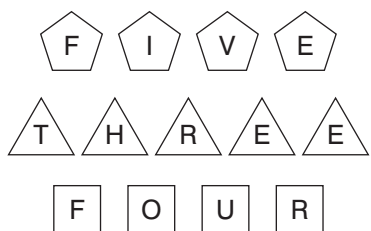
17. 4: 6 × 9 = 54 (reading down the middle two blocks);   **18.** quirky;   **19.** 600: 72 ÷ 12 × 100;   **20.** C: looking across and down the triangles turn through 90°;   **21.** IVH: the first letter moves three places in the alphabet forwards: FghI; the second letter moves four letters in the alphabet forwards: RstuV; the third letter moves two places in the alphabet backwards: JiH;   **22.** C;   **23.** C: each circle is repeated rotated;   **24.** PROPELLER;   **25.** 11: there are two alternate sequences: +3 and –4;

26. $\dfrac{14}{55} \times \dfrac{77}{56} = \dfrac{1}{5} \times \dfrac{7}{4} = \dfrac{7}{20}$

27. C: each row and column contains six complete lines and six broken lines; **28.** improbable; **29.** £8.00 per person: starter = 1 unit, sweet = 2 units, main course = 4 units, = 7 units in total. Therefore, cost per unit = £56 ÷ 7 = £8.00. The main course, therefore, cost 4 × 8 = 32 (or £8.00 per person); **30.** maroon: the letters start and finish with the alphabetic sequence: ABcDEfGHiJKlMN; **31.** C: the top arm moves 45° clockwise at each stage and the bottom arm moves 90° clockwise; **32.** 55: each number indicates its position in the grid. 55 indicates row 5 column 5; **33.** GET A MOVE ON; **34.** B: only dots that appear in the same position just twice in the first three hexagons are carried forward to the final hexagons; **35.** 12: add the digits of each three-figure number to obtain the two-digit numbers; **36.** NO STRINGS ATTACHED; **37.** C: in each row and column only lines that are common to the first two squares are carried forward to the final square; **38.** They will never appear together in the same corner as in a heptagon three corners clockwise is the same as four corners anticlockwise; **39.** CHAMELEON: to produce ARC, ASH, SEA, GEM, PIE, AIL, HUE, AGO, MAN;

40.

5	18
36	15
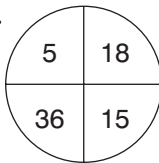
Top left is a third of bottom right, bottom right is three less than top right and top right is half of bottom left.

Test Four: Answers

1. B: the inner hexagon is being dismantled one side at a time working anti-clockwise, while the outer hexagon is being constructed one side at a time working clockwise; **2.** 92.2: deduct 2.6 at each stage; **3.** DISAPPEAR; **4.** 3649: in all the others multiply the first two digits together to produce the number formed by the last two digits; **5.** practicable, feasible; **6.** second, last; **7.** 72932;

8.
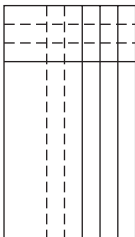
Vertical lines turn dotted, one at a time at each stage. One horizontal line is added at each stage, and the previous lines become dotted;

9. dishevelled;   **10.** 1417: 42 ÷ 3 = 14, 51 ÷ 3 = 17;   **11.** ADD FUEL TO THE FIRE; **12.** E: the rest are the same figure rotated;   **13.** tributary: in the other words the prefix tri- refers to three;   **14.** 7: the numbers round the centre increase by seven (in the others they increase by three and five respectively);   **15.** 157: 7 + 8 = 15, 2 + 5 = 7; **16.** B: looking across an outer circle is removed, looking down an outer circle is added;   **17.** silk;   **18.** 425136 or 631524;   **19.** SKYSCR(APE)R;   **20.** D: looking across, the dot in the top left-hand quarter moves to the opposite corner, the dot in the top right-hand quarter moves one corner anticlockwise at each stage, the dot in the bottom left-hand quarter moves between the top two corners, and the dot in the bottom right-hand quarter moves one corner clockwise at each stage;   **21.** C: the first three arcs are being repeated; and the position of the arc shifts 180°;   **22.** EXPAND, REDUCE;   **23.** C: looking across each line add three; looking down each column add two;   **24.** chord, cord;   **25.** Mary 16, George 17, Alice 24, Stephen 56, Claire 71; **26.** E: looking across and down, lines are carried forward from the first two squares to the final square when they appear in the same position twice in the first two squares. However, they then change from complete to broken lines, and vice versa; **27.** ILLICIT;   **28.** 9: (7 × 9) ÷ (7 × 1);   **29.** FOLLOWER, DISCIPLE;

30.
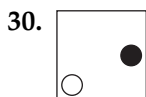
The white dot moves corner/side/corner anticlockwise and the black dot does the same clockwise;

31. elicit: the following word begins with the last two letters of the previous word reversed;   **32.** pentagon;   **33.** 9;   **34.** A: looking across the squares, the top left corner alternates one line/two lines/three lines; the top right corner alternates line right vertical/line left vertical; the bottom left corner alternates top horizontal/ bottom horizontal and the bottom right corner alternates diagonal between opposite corners;   **35.** 5/8 or 0.625 or 62.5 per cent;   **36.** F;   **37.** HIBERNATE; **38.** 1: work backwards from 120; that is, 120 − 60 − 12 − 3 − 1;   **39.** D: all lines are continued. However, wavy lines become straight and vice versa;   **40.** 52: start at the top left corner and work along the top line, then back along the second line, etc, adding nine then deducting three.

Test Five: Answers

1. C: it has three white and one black on the left and three black and one white on the right. The rest are the opposite way round;   **2.** cheeky;   **3.** ear, brain;   **4.** 6957: all the rest progress +3, −2, +3;   **5.** CIRCUMNAVIGATION;   **6.** 12;   **7.** 150, 157: the sequence progresses +1, ×2, +3, ×4, +5, ×6, +7;   **8.** alleviate: it means to lessen, the rest meaning to increase;   **9.** 4: (6 + 7) − (4 + 5);   **10.** OCTOPUS: to produce DUO,

ARC, SAT, AGO, MAP, YOU, WAS;   **11.** C: at each stage the third circle moves to the end and the sixth circle moves to the beginning;   **12.** 8: the number in the middle is the average of the numbers round the outside. So, 7 + 8 + 9 + 7 + 8 + 9 = 48, and 48 ÷ 6 = 8;   **13.** MAGNETISM;   **14.** 115: in eight years the combined age is 124; the age now is 124 – (8 × 3) = 100. Age in five years is 100 + (5 × 3) = 115;   **15.** ripe, mellow;   **16.** C: all lines carry on and change from dotted to unbroken, and vice versa;   **17.** crevice;   **18.** Jack 10 and Jill 5;   **19.** COME TO LIFE;

20.
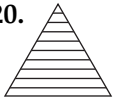
The sequence progresses circle, triangle, diamond, with alternate horizontal/vertical lines;

21. 730: deduct 135 each time;   **22.** C: it contains four black dots and three white;   **23.** might/mite;   **24.** 2646 (14 × 189);   **25.** using few words;   **26.** SATURATE, WATERLOG;   **27.** 65: there are two alternate sequences: +12 and +9;   **28.** C: the large rectangle is being dismantled, half a side at a time anticlockwise; the small rectangle is being constructed half a side at a time clockwise;   **29.** TESTIMONY;   **30.** 6: so that the numbers in the triangles, squares and circles add up to 33;   **31.** C: so that one dot appears in one triangle and the other dot appears in two triangles (in the example the right-hand side forms a small triangle and a larger triangle and the dot is in both);   **32.** 9: the alternatives are: England win both golf and tennis, Scotland win both golf and tennis, Wales win both golf and tennis, England win golf, Scotland win tennis, Scotland win golf, England win tennis, England win golf, Wales win tennis, Wales win golf, England win tennis, Scotland win golf, Wales win tennis, Wales win golf, Scotland win tennis;   **33.** retirement: statement/testament and fluster/restful are anagram pairs;   **34.** Switch A is faulty;   **35.** 2: so that each square block of four numbers totals 15;   **36.** E: the small ellipse moves 45° clockwise and alternates inside/outside of the larger ellipse;   **37.** BARRIER REEF;   **38.** K;   **39.** 3645: in all the others the number formed by the first two digits added to the number formed by the second two digits equals 99;   **40.** B: looking across and down, only dots that appear in the same position in the first two squares are carried forward to the third square; however, they then change from black to white and vice versa.

Test Six: Answers

1. OSCILLATE, FLUCTUATE;   **2.** 47: each number is the sum of the previous two numbers, ie 18 + 29 = 47;   **3.** expand, reduce;   **4.** E;   **5.** fry;   **6.** 40 minutes: (70 × 8) ÷ 14. Total time for eight players = 70 × 8 = 560 minutes. However, as 14 people are each on the pitch for an equal length of time, they are each on the pitch for 40 minutes (560 ÷ 14);   **7.** two sides to every story;

8.
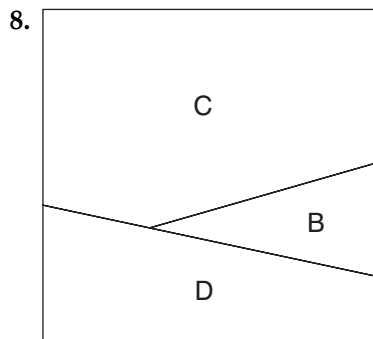
9. abutment: it is part of a structure, the rest are specific types of arch;   **10.** 4: in each row and column in order to arrive at the final number multiply the first two numbers together and divide by 6;   **11.** F;   **12.** D: looking both across and down, only lines that appear in both the first two squares are carried forward to the third square;   **13.** TO LIE IN WAIT;

14.
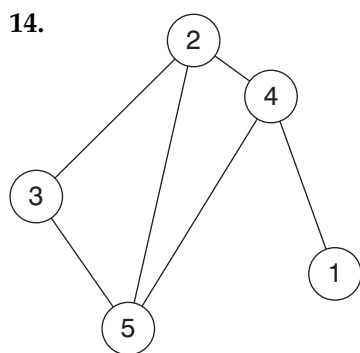
15. PANORAMIC;   **16.** C: only lines and symbols that appear just twice in the outer circles appear in the inner circle;   **17.** SUCCINCT, RAMBLING;   **18.** the Arctic = architect. The buildings are: cathedral (delta arch), minaret (raiment), castle (cleats), bungalow (a blowgun);   **19.** 40 days: five men take $5 \times 16 = 80$ man days to build the house. Two men will, therefore, take 40 days to build the house ($80 \div 2$);   **20.** A: each pair of circles are mirror images of each other;   **21.** E: the number of sides reduces by one at each stage, and the section two clockwise from the single white dot disappears;   **22.** come to life;   **23.** MOP. JklM – RqpO – MnoP;   **24.** 11615: $8 + 3 = 11$; $1 + 5 = 6$; $9 + 6 = 15$;   **25.** FREE, LIBERATE;   **26.** C: the two circles overlap each other and the square; the triangle and square overlap;   **27.** rues / ruse;

28. $\dfrac{27}{74} \times \dfrac{37}{9} \times \dfrac{6}{17} = \dfrac{3}{2} \times \dfrac{6}{17} = \dfrac{18}{34} = \dfrac{9}{17}$

29. N;

30.
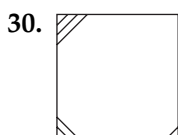
At each stage lines are added to a new corner working anticlockwise and a new line is added to corners already containing a line;

31. 6: $36 \times 2 = 72$; $14 \times 2 = 28$ and $43 \times 2 = 86$;   **32.** hold: to form compound words: nightlong, longboat, boathouse, household;   **33.** sword;   **34.** 32: $6 \times 4 = 6 + 18$, $7 \times 3 = 11 + 10$, $9 \times 2 = 5 + 13$, $16 \times 4 = 32 + 32$;   **35.** B: looking across and down add another circle, alternating black/white, to alternate squares;   **36.** 1: average $45 \div 9 = 5$; second lowest even number $= 4$;   **37.** 2 kilograms: half weight $= 1$ kg $(+1$ kg$) = 2$ kg;   **38.** EUCALYPTUS, SANDALWOOD;   **39.** 5: $(6 + 8) - 9$;   **40.** B: so that each connected straight line of three circles contains one each of the three different types of star.

Test Seven: Answers

1. A: the square goes inside the diamond and the diamond in turn goes inside the pentagon, which turns onto its base;   **2.** staff: it is a support for a flag. The rest are all types of flag;   **3.** £900: change everything to twentieths. So, $^8/_{20} + {}^{11}/_{20} = {}^{19}/_{20}$. Therefore, £45.00 must be equal to $^1/_{20}$ and the original sum of money must be $45 \times 20 = 900$;   **4.** C;   **5.** elemental;   **6.** WIND: HEADWIND and WINDLASS;   **7.** 1: the number formed at the top is half of the number formed at the bottom, ie $358 \times 2 = 716$;

8.

5	3	7
8	6	2
1	9	4

The above numbers indicate the order in which the nine squares should be visited from the starting point (the square numbered 1) through to the finishing point (the treasure square number 9);

9. B: looking across, the dot moves 45° clockwise at each stage, but looking down it moves 45° anticlockwise;   **10.** A: lines across progress, in turn, –1, –3, –5, –4;   **11.** proficient, unskilled;   **12.** venture, introduce;   **13.** 971613: numbers are obtained by adding pairs of digits, ie with 571219: $5 + 7 = 12$; $7 + 12 = 19$. To follow this same pattern 971613 would have to be 971623;   **14.** pull wool;   **15.** B: the dot moves corner/side anticlockwise, the straight line and the curved line both move

corner to corner clockwise;   **16.** 72.5: the amount deducted increases by 2.75 each time, ie 2.75, 5.5, 8.25, 11;   **17.** tree;   **18.** 32: the total of three numbers must be 48 × 3 = 144. The total of two numbers must be 56 × 2 = 112. Therefore, 144 – 112 = 32; **19.** actions speak louder than words;   **20.** 6;   **21.** OBLIGATE;   **22.** PUSH THE BOAT OUT;   **23.** E: the rectangle starting on the left is moving from left to right one place at a time at each stage;   **24.** 83: there are two alternate sequences: +3 and –4; **25.** stead: to give homestead and steadfast;

26.

5	2	8	6
6	5	9	1
3	6	3	9
7	8	1	5

27. DORMOUSE and SQUIRREL;   **28.** F: looking across and down, lines are carried forward from the first two squares to the final square, except where two lines appear in the same position in the first two squares, in which case they are cancelled out; **29.** EVIDENTIAL;   **30.** 9: (6 + 17) – (5 + 9);   **31.** B: the white dots are each moving left to right and bottom to top (and vice versa) one place at a time at each stage; **32.** D;   **33.** 82: combined age in 9 years time will be 94 – (3 × (13 – 9));   **34.** ASSEMBLE, DISPERSE;   **35.** 31 and 4: 12 × 7 = 84; 8 + 12 + 7 + 4 = 31;   **36.** B: the left side contains the same symbols as the right side but with black/white reversal;   **37.** Switch B is faulty;   **38.** PALATABLE, TASTELESS;   **39.** 6: 5749827 + 3864759 = 9614586;   **40.** E: looking across and down, lines are carried forward from the first two squares to the final square, except where two lines appear in the same position in the first two squares, in which case they are cancelled out.

Test Eight: Answers

1. 19, 21, 24: the sequence progresses +1, +2, +3 repeated;   **2.** crater/cater;   **3.** 8; **4.** B: looking across, the letters jump +2, +3 in the alphabet, for example – AbcdeF. Looking down, they progress +4, +5, for example – AbcdEfghiJ;   **5.** D: so the dot appears in the diamond and circle only;   **6.** PUPILS SLIP UP;   **7.** 2 6, 0 3. Looking across, the numbers in the same position in each pair progress: 8, 6, 4, 2; 3, 4, 5, 6; 9, 6, 3, 0; 6, 5, 4, 3;

8.
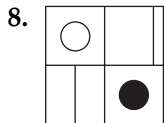
The top left-hand corner alternates black dot/white dot; the top right-hand corner alternates horizontal line/vertical line; the bottom left-hand corner line moves diagonal/vertical/diagonal/horizontal/diagonal, and the bottom right-hand corner alternates white dot/black dot;

9. sow: it is a female animal, the rest are male; **10.** Margaret 17, Stuart 12, Jeffrey 32, Brian 25 and Philip 21; **11.** CREATIVITY, REACTIVITY;

12.
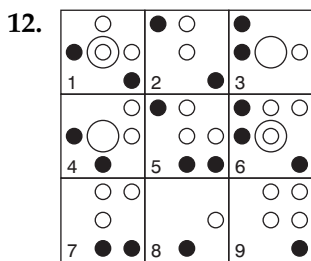
Tile 6 is incorrect and should be replaced by tile E;

13. watertight, tenuous; **14.** 6: the total of the numbers in each column alternates 20, 30, 20, 30, 20, 30; **15.** GESTURE; **16.** A; **17.** overt; **18.** Harry 32, Larry 24, Carrie 18; **19.** salubrious, healthy; **20.** F: the circle becomes a square and the four white squares become white circles; **21.** D: looking across, the number of dots increases by one and white becomes black. Looking down, the number of dots decreases by one and the dots stay the same colour; **22.** ABSOLUTE MAJORITY; **23.** Switch C is faulty; **24.** C: the black square originally in the top right-hand corner is moving right to left one space at a time at each stage. The other black square is moving from bottom to top; **25.** LINE OF WORK; **26.** 1456 (91 × 16); **27.** ANOIP = PIANO; **28.** 12.25: add 1.25, 1.5, 1.75, 2, 2.25, 2.5; **29.** hand: second hand, handsome; **30.** E: looking across, the number of lines increases. Looking down, the number of circles increases by one and the circles fit within the bands formed by the lines; **31.** 22 minutes. Midnight less 22 minutes = 11.38. Less 32 minutes = 11.06. 10 pm (22.00) plus 66 minutes (22 × 3) = 11.06; **32.** tiara. The consonants b t r n and l are being repeated in the same order; **33.** LENGTHEN, DIMINISH; **34.** 131: add 30, 28, 26, 24, 22;

35.
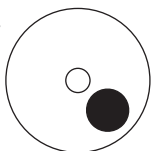
The large circle moves 45° clockwise and alternates white/black. The centre dot alternates black/white;

36. LAND LOCKED;   **37.** DISBELIEF;

38. $\dfrac{5}{9} \times \dfrac{18}{15} = \dfrac{2}{3}$

39. 50 per cent: it is a certainty that at least two coins will land with the same side face up. It is equally likely that these two coins will land heads up as they will land tails upwards. It is immaterial what occurred in the previous toss;   **40.** B: it has three circles of differing sizes, one triangle, one dot out on its own, one dot in the large circle only and the other dot in the middle-sized circle and triangle.

Test Nine: Answers

1. A: square 1 moves to bottom right, square 2 moves to top left, square 3 moves to top right and square 4 moves to bottom left;   **2.** HIDE, REVEAL;   **3.** black, olive, fawn, cyan, pink;   **4.** A: lines across progress +2, +4, +6, + 8 in turn. Columns down progress +3, +5, +7, +9 in turn;   **5.** D;   **6.** H: in all the others the outer figure is repeated in the middle;   **7.** TENDER LOVING CARE;   **8.** 2: the total of the numbers in the shaded section in each hexagon is half the total of the remaining numbers;   **9.** include: each word begins with the sixth and fifth letters of the preceding word;

10.
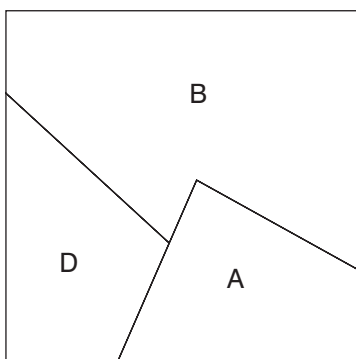
11. SCARE, ALARM;   **12.** pit;   **13.** 85647: reverse the first number and discard the highest and lowest digits;   **14.** U: AbCdeFghiJklmnOpqrstU;

15.
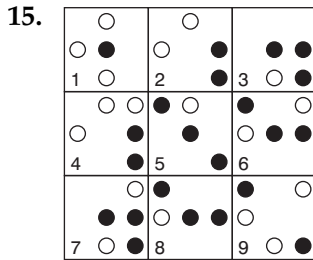
Tile 8 is incorrect and should be replaced by tile B;

16. 81: add 27 each time;   **17.** calypso: it is a song, the rest are dances;   **18.** B: looking across, lines progress +4, looking down, columns progress +3;   **19.** Stella: each name begins with the middle two letters of the previous name;   **20.** C;   **21.** E: it contains exactly the same symbols as the original;   **22.** 4: all lines and columns total 18;   **23.** GERANIUM, DAFFODIL;   **24.** C: the contents of each pentagon are determined by the contents of the two pentagons immediately below it. Lines and dots are carried forward from these two pentagons, except when a line or dot appears in the same position, in which case they are cancelled out;   **25.** PEACH, OLIVE, COCONUT;   **26.** 13: opposite numbers total 15;

27.
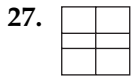
Lines are added vertically then horizontally alternately;

28. HARMFUL, SAFE;   **29.** 1394: (82 × 17);   **30.** reef: acti(**on e**)ffor(**t wo**)r(**th ree**) (**f our**)self;

31.
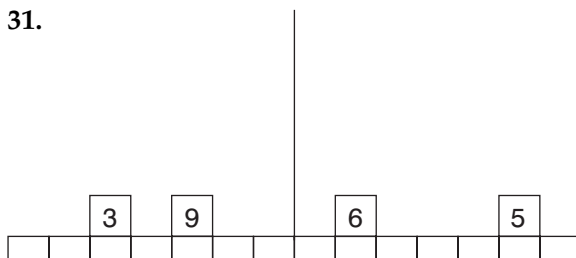
5 × 3 = 15, 3 × 9 = 27, 15 + 27 = 42, 30 + 12 = 42, 6 × 5 = 30, 2 × 6 = 12;

32. 5: each row of numbers contains the digits 1–9;   **33.** C: the arms move clockwise in turn 45°;   **34.** water: to give salt water, waterfall;   **35.** detonator: the rest contain

the letters 'der' adjacently;   **36.** £43.20: Christine = £24 or five parts, therefore, each part = £4.80. Total of nine parts shared = £4.80 × 9 = £43.20;   **37.** £54.00: Christine's share = £24.00 or four parts, therefore, each part = £6.00. Total of nine parts shared = £54.00;   **38.** D: the diamond is moving round each corner clockwise. The black portion alternates overlapping section/diamond/square;   **39.** PRAISEWORTHY;

40. A   B   C   D

A	B	C	D
7	9	4	5
13	11	14	9
25	27	20	23
47	45	50	43
95	97	88	93

The numbers in each row are determined, as follows, by the numbers in the row above: A + C = B; B + D = C; B + C = A; C + D = D.

Test Ten: Answers

1. 17: 8 + 9 = 17; 7 + 6 = 13;   **2.** bland;   **3.** 86: the amount deducted increases by 0.5 each time, ie 0.5, 1, 1.5, 2, 2.5, 3, 3.5;   **4.** Switch B is not working;   **5.** D: so that the dot is in the square and two circles;   **6.** deltoid: it means triangular in shape. The rest mean double or twofold;   **7.** 2: in rows and columns alternate digits total the same, for example 5 + 9 = 10 + 4;   **8.** METEORIC: to give some/melt, late/test, door/oral, epic/icon;   **9.** C: the rest are the same figure rotated;   **10.** The fathers' rights activist's dog buried its bone in the garden;   **11.** 6394: all the others are in pairs where the second and fourth digits change places: 5278/5872, 9416/9614, 7895/7598, 6231/6132;   **12.** D: the contents of each pentagon are determined by the contents of the two pentagons immediately below it. Only when a dot appears in one of the corner positions or centre just once in these two pentagons, is it carried forward to the pentagon above;   **13.** austere;   **14.** EJBATC = ABJECT;   **15.** 6471589: reverse the first three digits, then the last four digits;   **16.** E: it contains a triangle in a circle, a circle in a square and a black dot in a triangle;   **17.** spur;

18.
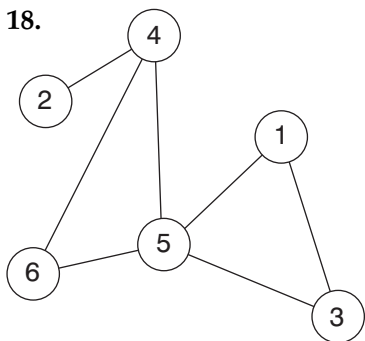
Alternatively as above but with 1 and 3 reversed;

19. BELL: BLUEBELL, BELLOWED; **20.** C: in each row and column the contents of the third square is determined by the contents of the first two squares. Lines are transferred from these two squares to the third square, except when they appear in the same position in both squares, in which case they are cancelled out; **21.** C: a line is added at the top and bottom alternately; **22.** haughty, arrogant; **23.** Switch B is faulty; **24.** SPINACH, CARROT, POTATO; **25.** B: the figure is tumbling over and alternates white/striped; **26.** revival, extinction; **27.** B; **28.** irrational; **29.** 25: there are two alternate sequences: +4 and –3; **30.** cost: all the words have their letters in alphabetical order; **31.** FRAME OF MIND; **32.** D: the dot is in a triangle; **33.** 5: 70 ÷ 14 = 5; 91 ÷ 13 = 7, 120 ÷ 24 = 5; **34.** H; **35.** PULL TO PIECES; **36.** 46: start at 1 and work clockwise adding 3, 6, 9, 12, 15, 18; **37.** D: so that it appears in a circle with three secants (lines) passing through it; **38.** 425: (68 ÷ 16) × 100;

39. PAUSE:

```
  5 1        (1 2 3 4 5)     3 2    4
  E M P T Y (P R I S M) V  I R U S
  D E P T H (P A U S E) D U A  L S;
```

40. 13: the numbers in each circle total 100.

Test Eleven: Answers

1. E: divide into groups of four identical arrows. In each group of four, each arrow moves 90 degrees clockwise. One arrow appears black in each group moving forward one place each time; **2.** INSULT, PRAISE; **3.** COSMOPOLITAN; **4.** 41 minutes; **5.** F: the figure at the top of the main figure flips into it, and the figure originally inside flips out; **6.** lupine: it is a word meaning wolf-like. The remaining words are all connected with foxes; **7.** FLEET;

8.

$D \times C = B$
$B + D = A$
$B + C + D = E;$
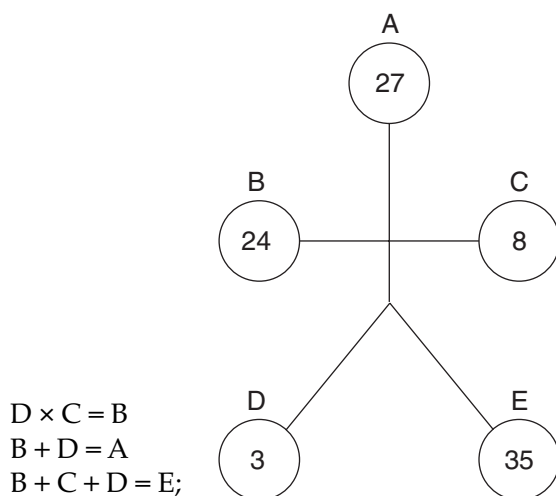
9. C: looking down, a vertical line is added to the bell, and looking across, two horizontal lines are added;   **10.** colour: Beaufort is a scale of wind, Munsell is a scale of colours;   **11.** bawdiness (wise bands);

12. d. 87923

A	B	C	D	E		B	E	D	C	A
6	4	5	2	1		4	1	2	5	6
A	B	C	D	E		B	E	D	C	A
3	8	2	9	7		8	7	9	2	3;

13. 15;   **14.** GRACIOUS, MERCIFUL;   **15.** CHINA;   **16.** 239: $1 \times 2 + 1 = 3$; $3 \times 3 + 2 = 11$; $11 \times 4 + 3 = 47$; $47 \times 5 + 4 = 239$;   **17.** C: each segment is a mirror image of the segment opposite, but with black/white reversal;   **18.** to hot up;   **19.** 72.5: the amount deducted increases by 2.75 each time, ie 2.75, 5.5, 8.25, 11;   **20.** F: all the others have an identical pairing;   **21.** cats lie = elastic. The colours are: such tent = chestnut, cap riot = apricot, red navel = lavender, for fans = saffron;   **22.** D: the curl alternates left/right, the eyes alternate left/forward/right, the nose alternates black/white and the mouth alternates happy/sad/straight;

**23.** 17   10   15

12   14   16

13   18   11

Magic number 42;

24. D: A is the same as E but with black/white reversal, and similarly B is the same as C;   **25.** lope;   **26.** ALCOVE, VESSEL, ELAPSE, SERIAL;   **27.** 2 minutes 33 seconds (2.55 minutes). At 50 mph the train takes $2.125 \times 60 \div 50$ to pass through the

tunnel, ie 2.55 minutes;   **28.** 16;   **29.** eat;   **30.** MONDAY;   **31.** 7 6 8 5 8. The first three lines are repeated, but reversed;   **32.** D: the rest are the same figure rotated; **33.** PRO: PROFANE, PROPER;   **34.** TPHED = DEPTH;   **35.** 36: 32 ÷ 8 × 9 = 36. Similarly 12 ÷ 3 × 2 = 8 and 24 ÷ 6 × 7 = 28;   **36.** B: in all the others, only the portion common to all three figures is shaded;   **37.** b. to obscure;   **38.** TERMINAL VELOCITY;

39.
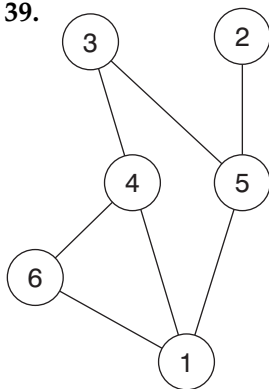
40. A: the contents of each hexagon are determined by the contents of the two hexagons directly below it. In the second row from the bottom, add the number of circles in the hexagons below. In the third row from the bottom take the difference ie, subtract, therefore, in the top circle add again, so one circle plus two circles means three circles in the top hexagon.

Test Twelve: Answers

1. D: first add one black dot to the horizontal, then two black dots to the vertical, then one white dot to the vertical and then two white dots to the horizontal; **2.** SCENT, AROMA;   **3.** STEADFAST;   **4.** 4 mph. Say the journey is six miles each way. Then at 6 mph the outward jog would take one hour and the inward walk two hours. This means he takes three hours to travel 12 miles or one hour to travel four miles;   **5.** B: it contains one dot in one circle, one dot in two circles and one dot in three circles;   **6.** HAMPER;   **7.** 30 mph;   **8.** D: each horizontal and vertical line contains a circle, triangle and diamond. Also one square has no line, one has a vertical line and one a horizontal line;   **9.** indurate: this is a word meaning harden, the other words mean soften;   **10.** Shakespearean (a keen phrase as);   **11.** verso, which is a word meaning a left-hand page and should, therefore, be in the left-hand column;   **12.** 5: the difference between 6 and 1 is 5, and the difference between 9 and 4 is 5. Similarly the difference between 7 and 3 is 4 and the difference between 5 and 2 is 3;   **13.** C: each fourth square contains a circle, each alternate square contains a diamond and each third square contains a dot;   **14.** superseded;   **15.** LIKE

FATHER LIKE SON;   **16.** 9 pm;   **17.** C;   **18.** pet hens = Stephen. The buildings are: spoil hat = hospital, my bases = embassy, eel clog = college and admit us = stadium;   **19.** 9.25: add 1.65 each time;   **20.** D: the contents of each pentagon are determined by the contents of the two pentagons immediately below it. Lines are carried forward from these two pentagons, except when two lines appear in the same position, in which case they are cancelled out;   **21.** B: circles are only transferred to the middle circle when they appear in the same position just once in the four surrounding circles;   **22.** wizened, plump;   **23.** consternation (tennis cartoon);   **24.** 45: 36 ÷ 4 × 5; similarly 56 ÷ 8 × 5 = 35 and 42 ÷ 14 × 5 = 15;   **25.** D: each segment is moving 45 degrees clockwise at each stage;   **26.** cleverness;   **27.** FALL;   **28.** 7.5 kg: 9 × 5 = 45 and 6 × 7.5 = 45;   **29.** B: the rest are the same figure rotated;   **30.** year in year out;   **31.** 6: 58 − 49 = 9   3 × 18 = 54   54 ÷ 9 = 6;   **32.** B: the middle figure goes to the bottom, the right-hand figure goes to the top and rotates 180 degrees, the left-hand figure goes to the middle and rotates 180 degrees. The black dot goes to the top;   **33.** sabot: it is a shoe, the rest are hats;   **34.** dun;   **35.** 6: looking at the rows of numbers across, the totals from the top are 6, 7, 8, 9, 10;   **36.** D: A is the same as E with flaps in/out and similarly, B is the same as C;   **37.** ear;   **38.** bend over backwards;   **39.** 0: all numbers in the same position in each of the three squares add up to 10. Also, numbers formed in lines across add up to 1,110, eg, 574 + 212 + 324 = 1,110;   **40.** F: in each horizontal and vertical row of squares, the contents of the third square are determined by the contents of the first two squares. Lines are carried forward only when they appear in the same position in the first two squares.

Test Thirteen: Answers

1.   BETRAYAL   DEVOTION;
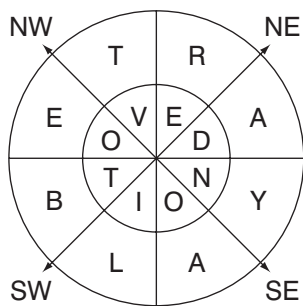
2. D: the rest are all the same figure rotated;   **3.** intricately (tiny article);   **4.** 586: 69 + 517 = 586;   **5.** E: looking down, the line is moving 90 degrees anticlockwise and the white circle is moving 45 degrees clockwise. Looking across, the line is moving 45 degrees clockwise and the white circle is moving 90 degrees anticlockwise;   **6.** captivity;   **7.** STAMPEDE: to give MAST/STAR, TEAM/AMID, PIPE/PERT and TIDE/DEAL;   **8.** 237 yards: eight holes average 156 = 1,248 yards, nine holes average 162 = 1,458 yards (+ 210), nine holes average 165 = 1,485 yards (+ 237);

9. E: the black dot is moving round the two verticals clockwise top/bottom/ bottom/top. The white dot is moving up and down the first vertical by half its length each time;   **10.** segment: it is a part, the rest are whole;   **11.** break, rake; **12.** £384. Harry's share is £240, ie each part is £48 (£240 ÷ 5). Therefore, the original amount was £48 × 8 (parts) (3 + 5) = £384;   **13.** C: looking across, the dot is moving from corner to corner clockwise. Looking down, it is moving from corner to corner anticlockwise;   **14.** lee crock = cockerel. The jobs/professions are: engineer = rein gene, mechanic = can chime, salesman = mean lass and attorney = no treaty; **15.** 29: 52 + 64 = 116. 116 ÷ 4 = 29. Similarly 93 + 95 = 188. 188 ÷ 4 = 47;   **16.** E: in all the others all areas common to two circles are shaded. In E, one such area is not; **17.** titanic;   **18.** IJKON: the rest are in the sequence three consecutive letters of the alphabet, then miss a letter, then reverse the next two;   **19.** 7462/2647;   **20.** A; **21.** C: the rest are the same figure rotated;   **22.** vestigial, rudimentary;   **23.** READ, WORN;   **24.** 27: halve the second and third numbers then multiply the first three numbers in each line to produce the fourth number, so 9 × 3 (6 ÷ 2) × 1 (2 ÷ 2) = 27; **25.** to fight shy of;   **26.** C: A contains the same figures as E and B contains the same figures as D;   **27.** 8: multiply the two outside numbers to obtain the number formed by the middle two digits reversed;   **28.** F: so that the first column is a mirror image of the third column and the second column is a mirror image of the fourth column; **29.** affluent;   **30.** generalities;   **31.** 4 6 1 3 5 2 or 2 5 3 1 6 4;   **32.** H: the left-hand figure rotates 90 degrees clockwise and goes to the bottom. The right-hand figure rotates 90 degrees anticlockwise and goes to the top. The centre ellipse changes from black to white;   **33.** contemplate;   **34.** ignorant = no rating. The synonyms are erudite = rude tie, learned = dear Len and literate = elite art;   **35.** 5617: in all the others, the third digit is the difference between the first and second digits and the first digit is the difference between the third and fourth digits;   **36.** A: each line and column contains the main figure once reversed, a white dot, a black dot and the internal figure once reversed;   **37.** tyro;   **38.** HUMANELY;   **39.** 1: each triangle contains the digits 1–9 once each only;   **40.** D: in each line and column ellipses are only carried forward to the third cloud when the same colour ellipse appears in the same position in the first two clouds; however, they then change from black to white and vice versa.

Test Fourteen: Answers

1. D: each segment is a mirror image of the segment opposite;   **2.** trip, jaunt;   **3.** R: skip two letters then three, ie AbcDefgHijKlmnOpqR;   **4.** 7, 8: looking down each column alternately, take the difference, then add, so, the difference between 2 and 9 = 7 and 5 + 3 = 8;   **5.** D: so that the four arrows are pointing North, South, East, West and opposite pointers are the same type, ie finger or arrow;   **6.** CRUDE, SUBTLE; **7.** premise;   **8.** 21: pairs of numbers in lines reading across = 24;   **9.** D: opposite corner blocks of four squares are identical;   **10.** pillory;   **11.** pleasant present; **12.** 1212: 6 × 2 = 12, 5 + 7 = 12. Similarly 4 × 6 = 24 and 9 + 7 = 16 (2416);   **13.** C: the

square on the left goes to the top, the square second left goes to middle right, the square second right goes to the bottom and the square on the right goes middle left; **14.** rod arch = orchard. The musical terms are baritone = no baiter, concerto = rent coco, overture = revue rot and rhapsody = shop yard;   **15.** 2 in the left-hand square and 8 in the right-hand square. Each row of numbers in the left-hand square is multiplied by 2 to arrive at the row opposite in the right-hand square, ie 3967 × 2 = 7934;   **16.** H: each row and column contains three black stars and four white stars; **17.** ON CLOUD NINE;   **18.** Jill 30, Peter 40, Kate 50;   **19.** to give a dog a bad name; **20.** C: all white segments remain the same but black segments turn white and flip over;   **21.** 5: each number represents the number of times that a number is adjacent to it, either horizontally, vertically or diagonally;   **22.** B: the contents of the third hexagon in each row and column are determined by the contents of the first two hexagons. Only when lines appear once in the same position in these two hexagons are they carried forward to the third hexagon;   **23.** ADORE, CHERISH, VENERATE, REVERE;   **24.** WITH ONE FELL SWOOP;   **25.** E: work along the top row, then back along the second row etc, repeating the first three symbols; **26.** OPPOSITE, MATCHING;   **27.** MUYJP = jumpy;   **28.** 50 minutes;   **29.** A: looking across and down, only when the same colour dot appears in the same position in the first two hexagons is it carried forward to the third hexagon, but then changes from white to black and vice versa;   **30.** fanlight: it is a British-English term, the rest are American-English terms;   **31.** F;   **32.** 7 and 9: the numbers at the bottom are the sum of the digits of the connected numbers at the top;   **33.** C: the taller triangle remains stationary. The other triangle moves from right to left by half the distance of the base of the taller triangle each time. The section common to both triangles is always shaded;   **34.** breastbone;   **35.** PENINSULA;   **36.** Tony 42, Cherie 38, Gordon 56;   **37.** 7: all the rest have a mirror-image pairing;   **38.** artichoke = take choir. The animals are antelope = one leapt, elephant = the plane, panther = trap hen and gazelle = leg laze;   **39.** 17: add the number of items together, which gives 83 + 77 + 62 + 95 = 317 among 100 women. This gives three items to each and four items to 17 of these women. The least number of women to have all three items is, therefore, 17;   **40.** B: the square moves from right to left, the ellipse rotates 90 degrees and goes from left to right and the dot moves to the extreme right within the ellipse.

Test Fifteen: Answers

1. C: all the other figures are identical. In C the dot is in the wrong place;   **2.** Billy; **3.** tit for tat;   **4.** 11: each pyramid of three numbers totals 21;   **5.** B: one rectangle remains stationary while the other rotates by half of the length of the stationary rectangle anticlockwise at each stage;   **6.** concerto: it is music written for instruments, the rest being songs, typically with words;   **7.** scale;   **8.** 32: (32 less 75 per cent = 8, less 0.625 = 3, less 1 = 2);   **9.** 17;   **10.** ineptitude;   **11.** contribution;   **12.** 2: the numbers surrounding each dot are always in ascending/descending order, eg

2467 or 7642;   **13.** E: the only one where a tail with a little circle is attached to a triangle;

14.

P	E	A	K	■	Z	E	A	L
■	A	■	I	■	E	■	■	■
■	S	■	N	O	S	Y	■	V
S	T	A	G	■	T	A	M	E
U	■	T	■	■	■	W	■	T
C	O	O	L	■	U	N	D	O
H	■	M	A	I	N	■	A	■
■	■	M	■	I	■	R	■	
S	H	I	P	■	T	A	K	E

15.   8   3
       4   2

Start at the bottom left-hand square and work round the perimeter anticlockwise spiralling into the centre and repeating the numbers 38429;

16. D: so that looking round the octagon at segments in pairs, there are four identical pairs with black/white reversal;   **17.** cold;   **18.** 30 18 48 66. Starting at the top, add pairs of numbers in each column to arrive at the next number;   **19.** flippancy, levity;   **20.** A: the top and bottom figures fold down and up onto the line respectively;   **21.** C: in all the others each line across in the same position in each square contains the same three symbols, albeit in a different order;   **22.** man to man;   **23.** intricate;   **24.** 60 kg + one-sixth of its own weight = 72 kg; 46 kg + one-third of its own weight = 69 kg (ie, 69/3 = 23);   **25.** D;   **26.** retrograde: it means to worsen, the rest being to improve;   **27.** 22: there are two alternate sequences, the first increases by 2, 4, 8 etc and the second decreases by 4, 8, 16 etc;   **28.** long;   **29.** A: the combination of dots on the inside is the same as in the diamond directly opposite;   **30.** 3: reverse the numbers either side and divide. So, 75 (57) ÷ 25 (52) = 3;   **31.** EAST-BOUND;   **32.** consequence;   **33.** D: all the others are identical. D contains a line in the wrong position;   **34.** 5: 5 × 18 = 90. 90 ÷ 2 = 45. Similarly 7 × 6 = 42. 42 ÷ 2 = 21;   **35.** past;   **36.** B: it contains the same shape of string but with large/small circle reversal;   **37.** 3: the numbers in the outside ring, top and bottom are arrived at by adding, ie 4 + 2 + 3 = 9 and 7 + 6 + 3 = 16. The numbers in the outside ring left and right are arrived at by multiplying, ie 4 × 7 × 3 = 84 and 2 × 6 × 3 = 36;   **38.** keen as mustard;   **39.** allegorical, factual;   **40.** E: the only one where an arrow points to a figure that has an odd number of sides.

Text Sixteen: Answers

1. sure;   **2.** E: it contains a triangle in a circle, a circle in a square and a circle in a triangle;   **3.** ear, leg and rib, to make weary, elegy and tribe;   **4.** 5: add the first three numbers in each row, then divide by 3 to obtain the final number: $2 + 9 + 4 = 15 / 3 = 5$; **5.** transcend: all the other words relate to fall. Transcend is a word relating to rise; **6.** B: the contents of the final square in each horizontal and vertical line is determined by the contents of the first two squares. Lines are carried forward from the first two squares to the final square, except where two lines appear in the same position, in which case they are cancelled out;   **7.** YIGEN = eying;   **8.** slight;   **9.** 2 mins 30 seconds $((3.5 + 0.25) \times 60 / 90)$ minutes $= 3.75 \times 60 / 90 = 2.5$ mins or 2 mins 30 secs; **10.** silver;   **11.** E: the first four complete figures are being repeated in the same order but only the left half is shown;   **12.** 15. Add the top and left-hand numbers and divide by 4: $47 + 13 = 60 / 4 = 15$;   **13.** hardly ever;   **14.** 5: looking down columns from left to right, $96 + 427 = 523$;   **15.** F;   **16.** D: the rest are all the same figure rotated;   **17.** O. Start at A and jump to alternate segments working clockwise in the sequence: AbCdeFghiJklmnO;   **18.** summit, conference;   **19.** end: to give impend and endear;   **20.** rear;   **21.** d. like a pyramid;   **22.** merlin;   **23.** Be sure the brain is engaged before putting the mouth in gear;   **24.** Yoga: the first letter of each word is the same as the last letter of the preceding word;   **25.** 38: $(8 \times 7 = 56) - (3 \times 4 = 12) = 44$; $(7 \times 9 = 63) - (4 \times 8 = 32) = 31$; $(5 \times 10 = 50) - (2 \times 6 = 12) = 38$;   **26.** By the time a man can read a woman like a book he is too old to collect a library;   **27.** C: each pair of circles is added together to produce the circle above, but similar symbols disappear;   **28.** 21;   **29.** disgorge;   **30.** The first two letters start the name of a country and the last two letters finish the name: POLAND, TONGA, SENEGAL, FINLAND, JORDAN, SPAIN;   **31.** GIGANTIC;   **32.** 96: $(6 \times 5) + (2 \times 4) = 38$; $(6 \times 2) + (7 \times 7) = 61$; $(8 \times 7) + (5 \times 8) = 96$;   **33.** mullet, grilse;   **34.** A;   **35.** F: looking both across and down, only lines or dots that are common to the first two squares are carried forward to the third square;   **36.** carapace;   **37.** c. flower;   **38.** scarab; **39.** LCA. The others make: flagon, fiacre, feline;   **40.** bantam-weight.

Test Seventeen: Answers

1. 11.27 am, ie 33 mins before 12 noon. $4 \times 33 = 132$ mins past 9 am $= 11.12$ am; **2.** Ban(glad)esh;   **3.** boycott, proscribe;   **4.** B: each horizontal line contains one each of the three different left-hand, right-hand and middle portions;   **5.** 1792 steps (896×2);   **6.** temper, ermine, negate;   **7.** chaste/chased;   **8.** D: the curved lines turn straight, and the straight lines turn curved;   **9.** astute;   **10.** HESITATE, RELATIVE; **11.** TY. Read along the top lines, middle lines and bottom lines in each set respectively to spell out the words: solitude, dedicate and alacrity;   **12.** 99: $4 + 5 = 9$, $3 + 6 = 9$;   **13.** February;   **14.** kill two birds with one stone;   **15.** card: all the words in list A can be prefixed with 'red', all the words in list B can be prefixed with 'blue'; **16.** A: starting at the black circle the circles are in sets of five, which are being repeated, except that in each set of five the black circle moves up one space;

17. domains and aim; all the other words are in pairs so that each three-letter word is spelt backwards in the middle of one of the seven-letter words: precast/ace, panache/can, attempt/met, sadness/end, special/ice, presume/use, suburbs/rub. The word *domains* spells iam backwards, not aim;   **18.** 3: starting at the top, and reading clockwise, each number, formed by the top and bottom digits in that order, is the previous number plus the sum of its digits;   So, 12 + 1 + 2 = 15, 15 + 1 + 5 = 21;   **19.** uniform;   **20.** A: C and D are the same with black and white reversed, as are B and E;   **21.** c. a sail;   **22.** A: the figure at the bottom rotates 90 degrees and goes to the left. The figure at the top rotates 180 degrees and goes inside the figure now on the left. The figure in the middle rotates 90 degrees and goes to the right;   **23.** D;   **24.** desserts (or 'stressed' anticlockwise);   **25.** beagle, barbet;   **26.** 145. Each number is obtained by adding the previous four numbers;   **27.** C;   **28.** d. steak;   **29.** The most brilliantly dressed army will usually lose;   **30.** Each word has three letters in succession in the alphabet;   **31.** night;   **32.** (40; 4 × 7 = 28) + (9 × 2 = 18) = 46; (7 × 3 = 21) + (8 × 4 = 32) = 53; (5 × 6 = 30) + (2 × 5 = 10) = 40;   **33.** perishable;   **34.** D;   **35.** D: opposite segments are a mirror image of each other, but with black/white reversal;   **36.** pedestal;   **37.** plaice;   **38.** a. brougham;   **39.** industrial revolution;   **40.** harridan.

Test Eighteen: Answers

1. A: directly opposite squares are a mirror image of each other;   **2.** 10: each number on the outside is the sum of the two numbers in the middle ring adjacent to it, plus the number in the centre. So, 4 + 3 + 3 = 10;   **3.** NO SLAM = salmon. The dogs are: looped = poodle; bag eel = beagle; sail UK = saluki; and bastes = basset;   **4.** manners: all words can be prefixed with *table*;   **5.** E: the sequence appears looking across each row of circles in the ellipses. The top row alternates right-sloping stripes, left-sloping stripes etc, the middle row is repeating the first three circles, and in the bottom row, the black segment is moving one segment clockwise at each stage;   **6.** out of this world;   **7.** brow;   **8.** all hands on deck;   **9.** 569 and 986: all the others are in anagram pairs of numbers, 749/479, 682/268, 516/165, 382/238, 578/758 and 129/291;   **10.** air, to give fair, hair, pair, chair and flair;   **11.** D: the figures on the outside transfer to the inside and change shape and colour. So, a white circle on the outside becomes a black triangle on the inside;   **12.** a. hard white mineral;   **13.** 3: 39 + 72 = 111, 21 + 16 = 37, 111 ÷ 37 = 3;   **14.** D: the contents of each hexagon are determined by the contents of the two hexagons immediately below it. Where two identical circles appear in the same corner in these two hexagons, they are carried forward to the hexagon above but change from black to white and vice versa;   **15.** conducted tour;   **16.** schism, rift;   **17.** edacious, generous;   **18.** 1: so that the total of each vertical line of numbers increases by one each time;   **19.** clog;   **20.** curt;   **21.** c. gown;   **22.** $1^{47}/_{81}$ (× $1^{1}/_{3}$);   **23.** beauty;   **24.** papillon;   **25.** 69: (6 × 9 = 54) + (7 × 8 = 56) = 110; (2 × 7 = 14) + (9 × 11 = 99) = 113; (5 × 3 = 15) + (6 × 9 = 54) = 69;   **26.** jackal, alpaca;   **27.** E: the symbols in the lower two circles combine to form the circle above, but similar symbols disappear;   **28.** d. a ranch;   **29.** William Tell Jr had

headaches;   **30.** c. ignorant;   **31.** $1^{115}/_{128}$ (× 1.5);   **32.** D. The others are: a. torque, b. toucan, c. toupee;   **33.** protract, lengthen;   **34.** A;   **35.** B: the figures are mirror-images but with black/white reversal;   **36.** C: so that each adjoining pair of hexagons contains three black dots and five white dots;   **37.** d. (hockey). The others are: marine, anchor, beacon, piracy;   **38.** 13¼. There are two series: +1¾ and –1¾: 8, 9¾, 11½, 13¼ and 10, 8¼, 6½;   **39.** lengthways;   **40.** southerly.

Test Nineteen: Answers

1. 12;   **2.** flower: this is the whole thing, the rest are parts of a flower;   **3.** 49, 46, 47, 44. Look at pairs of lines: 7 + 9 = 16, 4 + 9 = 13, 9 + 2 = 11, 7 + 2 = 9. Therefore, 22 + 24 = 46, 20 + 24 = 44, 24 + 25 = 49, 22 + 25 = 47;   **4.** quail;   **5.** new clue;   **6.** C: so that each straight line of three hexagons contains one each of the three different symbols;   **7.** tiny magical alarm;   **8.** 80: each number is formed by multiplying the number formed by the first two digits of the previous number by its third digit. So, 16 × 5 = 80;   **9.** signs of the zodiac;   **10.** principal, subsidiary;   **11.** F: the contents of the last square in each row and column is determined by the contents of the first two squares. Only when the same figure appears in the same position is a figure carried forward to the final square, in which case two circles become a trapezium, and two trapeziums become a circle;   **12.** 5 and 14: each number represents a letter of the alphabet according to its numerical position in the alphabet. The letters in each column spell out three letter numbers: 1, 2, 6 and 10;   **13.** weaponless: all the other words contain the adjacent letters ONE;

14.
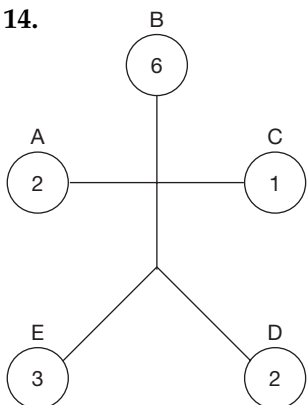
In each figure, A + C = E, A + C + E = B, B/E = D;

15. founder;   **16.** R: the letter on the outside is positioned midway between its two adjacent letters on the inside, in the alphabet;   **17.** XYZ = OLD: oldest, folded, scolds, uphold;   **18.** B: the outer arc moves 90° clockwise at each stage, the middle arc moves 180° at each stage, the inner arc moves 180° at each stage;   **19.** waspish,

peppery;   **20.** 48 mph. Say the journey takes 120 miles. The first half of the journey (60 miles) takes $60/40 = 1.5$ hours; the second half takes $60/60 = 1.0$ hour. So, the journey of 120 miles takes $1.5 + 1.0 = 2.5$ hours and therefore, the average speed is $120/2.5 = 48$ mph;   **21.** MICROSCOPE;   **22.** badger;   **23.** a. iron bucket; **24.** midge, the others start with a fish: bass, sole, dab, brill, cod, carp;   **25.** cuckoo, chough;   **26.** wheels within wheels;   **27.** IB;   **28.** hard;   **29.** The dimmer the light the greater the scandal;   **30.** a. bird;   **31.** a. tctale = cattle. The others are: canary, merlin, puffin, peewit;

32.   63. Multiply opposites:

$4 \times 3 = 12$	$1 \times 6 = 6$	$6 \times 7 = 42$
$2 \times 6 = 12$	$2 \times 4 = 8$	$1 \times 3 = 3$
$7 \times 9 = 63$	$7 \times 8 = 56$	$2 \times 9 = 18$
Total: 87	70	63

33. eggplant;   **34.** C;   **35.** Two letters can be placed at the beginning to make a new word: abalone, behold, changer, damask, enforce;   **36.** peculiar;   **37.** trochlea; **38.** They all contain the name of a tree: ash, elm, oak, lime, plum;   **39.** endanger, preserve;   **40.** 25.

Test Twenty: Answers

1. 105 kg; $250 \times 0.7 \times 0.8 \times 0.75$;   **2.** advocacy;   **3.** rambling: the rest are all anagrams of each other;   **4.** 3: the rest all have a mirror image pair, $1/9, 2/11, 4/12, 5/10, 6/14, 7/15, 8/13$;   **5.** 248: in the rest there is the same difference between each digit, eg 8 (–3) 5 (–3) 2;   **6.** Tuesday;   **7.** A: black segments only appear in the final square in each row and column when they appear in the same position in the first two squares; **8.** ruminate;   **9.** Their last four letters spell out another word reading backwards; groom/moor, spank/knap, plaid/dial, breve/ever;   **10.** C: it contains one figure which has been inverted and cannot be rotated to look the same; **11.** 4725: delete the digits outside the brackets that appear twice, and insert the remaining digits in the brackets in the same order that they appear outside the brackets – *8418* (4725) *1725*;   **12.** circle;   **13.** cranberry, to give arc, sir, pea, can, rub, ode, for, mar, coy;   **14.** desperado;   **15.** Measu(re For M)easure;   **16.** be all and end all;   **17.** obdurate, amenable;   **18.** C: each triangle changes from black to white in turn. At each stage a new triangle is added moving anticlockwise, and this new triangle first of all appears black, then alternates black/white at each stage; **19.** bream, cod, salmon;   **20.** 16 at the top, 10,920 at the bottom. The top number is the sum of all the digits in the previous diamond $(1 + 3 + 8 + 4 + 0)$. The bottom number is the product of the two numbers in the previous diamond (13×840); **21.** 21534 or 43512. Note that the sum of the numbers 1–5 is 15. According to the first line of the question, the numbers 2 and 4 must, therefore, be in the outside circles;

22. scarlet: the other words all carry an animal in reverse: elk, ram, dog, cat, rat; **23.** $^7/_{648}$ (x − $^1/_3$);   **24.** b. pumpkin;   **25.** knockabout;   **26.** No matter which way you ride, it is always up hill and against the wind every time, just bad luck;   **27.** A: the two circles below combine to produce the circle above, but similar symbols disappear;   **28.** incite, calm;   **29.** Fools rush in where fools have been before; **30.** E: so that the dot can be placed in the circle and the triangle only;   **31.** Vatrac (cravat). The others are: willow, spruce, acacia, deodar;   **32.** THIEVISH, CRIMINAL; **33.** CROOK;   **34.** E;   **35.** cabal, junta;   **36.** C: only black dots from the circles and white dots from the squares are carried forward to the hexagon;   **37.** Chaplin. The others are: Carter, Hoover, Truman, Wilson;   **38.** bonanza;   **39.** mildness, rigidity; **40.** 4: (13 − 7 = 6) × (8 − 6 = 2) = 12; (9 − 5 = 4) × (7 − 3 = 4) = 16; (9 − 8 = 1) × (7 − 3 = 4) = 4.

Test Twenty-One: Answers

1. E: it only contains four small white circles whereas the rest contain five;   **2.** 28; **3.** kidney;   **4.** quatrain: it is connected with the number four, whilst the rest all have a connection with the number five;   **5.** pose, model;   **6.** T: the letters in the middle convert the verb around the outside into past tense: come/came, know/knew, send/sent;   **7.** 16;   **8.** 871: 65/50 × 670;   **9.** badger, monkey, rabbit. The missing letters can be arranged to spell out *bribed men*;

10.

¹S	²H	Y	³D	E	W
A	⁴O	N	I	O	⁵N
⁶L	A	U	G	⁷H	I
O	⁸X	⁹E	N	O	N
¹⁰N	E	W	E	L	J
¹¹O	W	E	¹²P	E	A

11. C: the contents of the third circle in each row and column is determined by the contents of the previous two circles. Only when black or white dots appear in the same position in each of these two circles are they carried forward to the third circle, but then change from black to white and vice versa;   **12.** 10: in each row and column the difference between alternate digits is the same, ie 16 − 10 = 10 − 4;   **13.** forest florist; **14.** BE TASK = basket. The ships are, in order: tanker, galley, launch, sampan;   **15.** bundle of laughs;   **16.** C: the left-hand portion is folded over onto the right-hand

portion;   **17.** hearsay, rumour;   **18.** 8612: all the other numbers have their digits in descending order;   **19.** tender loving care;   **20.** act your age;   **21.** B: if you draw a line down the centre to divide the set of pentagons into two halves, the right half is a mirror image of the left half;   **22.** FRONT;   **23.** D;   **24.** vicuna;   **25.** C. A is murmur; B is mumble; D is mulish;   **26.** ORTHODOX, SECEDING;   **27.** E: x is added to y to make z; 1 is added to 2 to make 3, but like symbols disappear;   **28.** times: the other words also make words when spelt backwards;   **29.** hilltops;   **30.** b. a ballet movement;   **31.** Y, Z: the letters are made with three straight lines;   **32.** YASHMAKS; **33.** IMMODEST, INDECENT;   **34.** E;   **35.** When the bell rings there had better be some supper;   **36.** London. The others are: Scilly, Penang, Orkney, Cayman; **37.** ALKALI;   **38.** MACARONI;   **39.** 8: $(9 + 7 + 1 = 17) - (4 + 3 = 7) = 10; (8 + 5 + 6 = 19)$ $- (7 + 2 = 9) = 10; (5 + 8 + 2 = 15) - (6 + 1 = 7) = 8;$ **40.** FEEBLENESS.

Test Twenty-Two: Answers

1. D: each circle in the bottom half is a repeat of a circle in the top half, but rotated 90° clockwise;   **2.** SEEK, SEED, FEED, FEND, FIND. Some variations are possible and allowable;   **3.** adroit;

4.   agent:

    ALIGHT (AGENT) BONNET
     1   2   5 1 2 3 4 5   4 3

5. 10: starting from the bottom and working to the top, each triangular group of three numbers totals 21;   **6.** O: opposite letters are the same number of letters from the beginning and end of the alphabet respectively;   **7.** B: so that each row and column contains one each of the three different symbols;

8. The number of votes received by the winning candidate was (93648 + 25627 + 10681 + 5924) divided by 4 = 33970.

	33970
The second received 33970 – 5924 =	28046
The third received 33970 – 10681 =	23289
The fourth received 33970 – 25627 =	8343
Total	93648

9. HA: take the numerical position of each letter in the alphabet to reveal the sequence of consecutive square numbers 1, 4, 9, 16, 25, 36, 49, 64, 81;   **10.** gilt: *dart, send* is an anagram of *stranded*; *dine, gilt* is an anagram of *diligent*;   **11.** H;   **12.** E: the rectangle rotates 90°, the parallelogram flips over and goes inside the rectangle and the ellipse rotates 90° and goes below the rectangle;   **13.** lap;   **14.** 7: add the numbers in the same segments of the first two circles to obtain the numbers in the

same segments in the third circle. So, 3 + 5 = 8, 2 + 7 = 9, 4 + 3 = 7;   **15.** experimental: add the letters e, m and n;   **16.** d. open to all;   **17.** go like hot cakes;   **18.** bilk, swindle;   **19.** 9: add the top line of numbers to the bottom line to obtain the middle line, ie 473892 + 516359 = 990251;   **20.** B: there are two alternate sequences. In the first, the hexagon is losing one side at a time, in the other the hexagon is being constructed one line at a time;   **21.** b. hassock;   **22.** A cluttered desk a man of genius;   **23.** d. loop of thread;   **24.** HORRIBLE, SHOCKING;   **25.** Inland Revenue;   **26.** knothole;   **27.** 2C;   **28.** sheldrake;   **29.** 4: take the Roman numeral value of the second/third letters: A**VI**ATOR;   F**IX**TURE;   **WIZ**ARDS;   **DI**VERSE;   **30.** willow;

31.   0.10. There are two series: –0.19 and +0.19:

   (–0.19)   0.67, 0.48, 0.29, 0.10
   (+0.19)   0.69, 0.88, 1.07, 1.26

32. PARAGRAPHS;   **33.** RESTRAIN, WITHHOLD;   **34.** E;   **35.** d. skiing;   **36.** 23: the third line is the first line of figures reversed. The fourth line is the second line of figures reversed;   **37.** A;   **38.** El Salvador (an anagram of lover, salad as Bangladesh is an anagram of blade, gnash);   **39.** importance;

40.   11. Opposite numbers are deducted then added:

   6 – 1 = 5   8 – 3 = 5   7 – 3 = 4
   7 –2 = 5   4 – 2 = 2   9 – 7 = 2
   9 – 3 = 6 +   9 – 1 = 8 +   6 – 1 = 5 +
   16   15   11

Test Twenty-Three: Answers

1. D: the black triangle affixes itself to each arm in turn, the white triangle moves backwards and forwards between two positions, the triangle with the dot moves to each end of the middle arm (above then below) in turn, and the circle moves clockwise to each internal corner in turn;   **2.** 8 kg: 16/2 = 8;   **3.** highland;   **4.** intricate, simple;
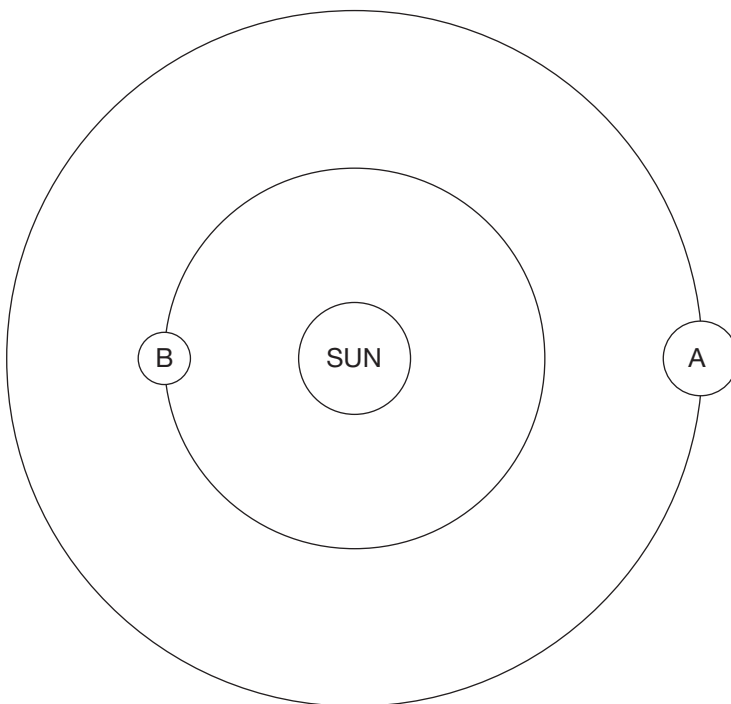
5.

A M B I	T E M G	I Y C H
T A A O	O M W O	E E M O
F R T D	N O I O	X F E L

The word *melodramatic* is spelt out round the outside perimeter;

6. D: the others are all the same figure rotated;

7. In 12 months' time;

8. take the bull by the horns;   **9.** A: large circles turn to small, and vice versa;   **10.** E: so that each line of letters produces an anagram of a colour: amber, green, azure,

lemon;   **11.** 10: each two-figure number is the sum of the digits of one of the three-figure numbers in the opposite circle;   **12.** Desdemona, to give: mid, ace, was, had, hue, him, who, ban, sea;   **13.** D: the figure rotates 90° at each stage and a different portion is shaded in turn;   **14.** at the ready;   **15.** aboriginal;   **16.** 16: 12 + 16 = 28/7 = 4;   **17.** banana, lemon, orange;   **18.** identical twins;   **19.** ch(ape)l;   **20.** satisfactory: add the letters i, f, t and r;   **21.** leaf;   **22.** shortage;   **23.** 4: from the top, 7 × 28 = 196 and from the bottom, 4 × 49 = 196;

24. 9 kg.   LH: 6 kg × 6 = 36 kg   RH: 5 kg × 5 = 25 kg
                           4 kg × 4 = 16 kg   9 kg × 3 = 27 kg
                           36 + 16 = 52 kg   25 + 27 = 52 kg

25. AEROBATICS;   **26.** LAZINESS, SLOWNESS;   **27.** E: x is added to y to make z, 1 is added to 2 to make 3, but similar symbols disappear;   **28.** b. pyramid (it is a solid, the rest are polygons);   **29.** irritant;   **30.** b. boat;   **31.** +12. There are two series: +5 and –9. –3, +2, +7, +12, +6, –3, –12;   **32.** 2: 4 × 10 = 40 and 23 + 15 = 38;   **33.** TIMOROUS, FEARLESS;   **34.** C;   **35.** d. sugar;   **36.** beetle;   **37.** bridge; the others are: eggcup, juicer, grater, scales;   **38.** Trust everybody but always cut the cards;   **39.** cardinal;   **40.** WORKADAY.

Test Twenty-Four: Answers

1. 330 and 41. Multiply the two numbers of the previous pair together to obtain the top number, and add the same two numbers to get the bottom number. So, 30 × 11 = 330, 30 + 11 = 41;   **2.** intrinsic: it is necessary because it is something that forms an essential part of a whole; the rest are necessary as a duty;   **3.** 75: 5 × 75 = 375. Similarly 7 × 52 = 364;   **4.** D: in all the others a black circle is in the middle of the chain of three connected circles;   **5.** temperature;   **6.** wary, rash;   **7.** past;   **8.** OPPORTUNE: add the letters p and u;   **9.** NFOLE = felon;

10.

A	D	R	O	I	T
C	H	O	P	A	A
T	A	L	A	S	P
M	D	E	S	K	A
U	O	B	I	N	D
D	E	M	A	N	D

11. B; it has lateral symmetry, in other words if the square was cut from top to bottom down the middle, the two halves (left and right) would be identical;   **12.** 3: the numbers in successive triangles add up to 8, 9, 10, 11, 12, 13;   **13.** skeleton;   **14.** foolish: all the other words start and finish with consecutive letters of the alphabet, eg *carried*;   **15.** speculator;   **16.** D: the figures are in the same order around the body;   **17.** O and H. There are two sequences going from top to bottom of the columns as follows: AbCdeFghiJklmnO, and ZyxWvutSrqpoNmlkjiH;   **18.** TA101: substitute Roman numerals for numbers to read: red, lime, navy, gold and blue. TA101 spells TAXI (10 = X and I = 1);   **19.** 88: 8 × 1 = 8, 8 + 0 = 8;   **20.** B: reverse each line and discard the third figure from the end each time;   **21.** c. a heap of stones;   **22.** They all commence with a boy's name: Bart, Tim, Pat, Don, Alf;   **23.** B: reversing the first analogy, the four black squares become one white square in the centre with four arms attached to it;   **24.** week, day, year;   **25.** 34: the first column is multiplied by the third column, and the second column deducted: (5 × 7) – 1 = 34;   **26.** ADVOCATE, ATTORNEY;   **27.** D. The lower circles' symbols combine to form the circle above, but similar symbols disappear;   **28.** c. fumerole;   **29.** All work and no play means you make money hand over fist;   **30.** winnow;   **31.** b. silk handkerchief;   **32.** a state of confusion;   **33.** 84: (7 × 4) × 9 / 3 = 84; (6 × 8) × 10 / 5 = 96; (3 × 7) × 8 / 2 = 84;   **34.** B;   **35.** RUBLEO (rouble). The others are: earwig, scarab, tsetse, hornet;   **36.** $1^7/_8$ (+$^1/_2$);   **37.** dahlia;   **38.** mere;

39.

17	6	12	8	22
24	13	14	9	5
11	7	1	25	21
3	23	18	19	2
10	16	20	4	15

40. grudgingly.

Test Twenty-Five: Answers

1. D: the figure is rotating 45° clockwise at each stage;   **2.** 40 minutes, or 11.20 am;   **3.** cohesive;   **4.** erect, supine;   **5.** B: at each stage the black element moves clockwise, first by one space, then two, then three, etc;   **6.** vicuna: it is a natural material, the rest are man-made;   **7.** soul / sole;   **8.** selling dwelling;   **9.** C: the top bit folds down into the square, and the bottom bit folds up into it;   **10.** 15: start at 0 and jump two segments each time clockwise in the sequence: 0 (+ 1) 1 (+ 2) 3 (+ 3) 6 (+ 4) 10 (+ 5) 15 (+ 6) 21;   **11.** like a cat on a hot tin roof;   **12.** evaporate: add the letters v and t;   **13.** A: only dots which appear twice in the same segment in the previous three circles are carried forward;   **14.** filament;   **15.** 941319: in all the others the first

two digits are added together to obtain the third and fourth digits, and the second digit is added to the third and fourth digits to obtain the fifth and sixth digits. For example, with 681422, 6 + 8 = 14 + 8 = 22;   **16.** spinach, carrot, bean;   **17.** JLM: in all the others there are two spaces in the alphabet between the first two letters and no space between the last two, eg AbcDE;   **18.** $65^2 = 16^2 + 63^2$;   **19.** reduce, cereal, allure;   **20.** megastar;   **21.** E: in all the others, the number of sides on the figure in the middle is one less than the number of sides on the figure on the outside; **22.** platform;   **23.** bubble;   **24.** a. dog;   **25.** scatterbrain;   **26.** DUMBSTRUCK; **27.** 2C;   **28.** METEORIC;   **29.** IRON;   **30.** BUTTER. The others are: mohair, sateen, damask, calico;   **31.** It won't work. Read the letter between the letters which follow: ie, H (i) JMZPS (t) UCAIV (w);   **32.** C. The others are: malice, makeup, makers; **33.** IMPOSING, SPLENDID;   **34.** C;   **35.** c. opaque;   **36.** felicity, bliss;   **37.** thinly sliced cabbage;   **38.** b. mixture;   **39.** GRIEVOUS, MOURNFUL;   **40.** shortbread.