Noesis

The Journal of the Titan Society
(Issue 19, October 1987)

Editorial

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The Titan Test: This issue contains my first typed draft of the test I have been working on for the past year. The multiple-choice answers have not been filled in yet, except for problem 36. I may replace some of the problems with others once I have some results from Trial Test "F", my sixth and (I hope) final preliminary test.

I am calling the test "The Titan Test." I would like, therefore, to rename the society "The Titan Society" again, at least until such time as my test has been published. If there is a clamor for a return to "The Noetic Society" after that, okay. I am retaining the name "Noesis" for this journal, but any new editor is welcome to change it to whatever he prefers, within reason. I have asked The Encyclopedia of Associations to list our society in its publication under the name "The Noetic Society," but I will ask them to change this to "The Titan Society" in its next edition.

I have sent a letter to Michael Steuben, a contributing editor with Discover magazine, to find out whether Discover would be interested in publishing my Titan Test in its "Brain Bogglers" puzzle column. Our member, Chris Cole, had suggested this to me. If I do not hear from Discover by the end of 1987, or if it cannot publish my test by the end of 1988, I will offer the test to Omni magazine instead, which published my Mega Test in April 1985.

Ideally, I'd like to build our membership up to around 50 and then launch a new one-in-a-million group, which I tentatively call "The Omega Society," since "Mega Society" is already taken. The Mega Society has been moribund for some time, but it may eventually revive. I have absolutely no interest in getting involved with the Mega Society again, but I wouldn't mind using its name if it should ever become defunct. About one-fifth of our members would be eligible to join the Omega Society, which might initially be merely an honorary society that continues to rely on our journal. We currently have 14 members, so presumably The Titan Test might boost our membership to 30 or so. One more test after that might bring us close enough to my goal of 50 members.

If my Titan Test is successful and is published in a mass-circulation publication like Discover or Omni, I might consider making the design and scoring of such tests my main vocation. I currently earn my living editing a monthly journal for the Triple Nine Society (if you call less than $400 a month a living!).

Questionnaire: I am enclosing a questionnaire in this issue. I hope all or most of you will fill it out. If you do not want your questionnaire responses published in this journal but are willing for the information to be grouped with other responses for statistical purposes, simply circle the word "Confidential" at the foot of the questionnaire. It would also be a good idea if all of you were to write to Chris Cole about his suggestion of a meeting for the entire membership, even if you have no interest in attending such a meeting.

The Titan Test

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This is a self-administered test of intelligence for adults with above-average intelligence. It is based on the best problems from six preliminary tests that were tried out by volunteers from several high-IQ societies. A sufficiently high score on this test will entitle you to join one or more high-IQ societies, whose names, addresses, and minimum requirements will be indicated on the score report form you will be sent if you attempt the test and submit your answers. Please read the following rules before starting the test:

(1) Time limit: There is no time limit. You may spend weeks or even months on the test if you wish. However, you may not change your answers once you have submitted them.

(2) Guessing: You will have one-third of a point subtracted from your total raw score for each wrong answer, so you should not guess unless you can reduce the number of likely solutions to three or fewer.

(3) Reference aids, etc.: You may use any reference aids (such as dictionaries, encyclopedias, textbooks, etc.) and any calculators (although all of the problems can be solved using only paper and pencil). But you should not ask or give anyone advice on how to solve the problems. None of the problems requires more than a high school education.

(4) Scoring fee: There is a scoring fee of $10.00. This will entitle you to a score report that includes (1) your total raw score on the verbal problems, (2) your total raw score on the non-verbal problems, (3) your I.Q., (4) your percentile standing vis-a-vis the general population, and (5) the names, addresses, and minimum requirements of all high-IQ societies that will accept this test for admission purposes. You will not receive the answers to the problems so that this test can continue to serve as an admissions test for high-IQ societies for an indefinite period of time. However, you will be sent a second test similar to this one for which the answers and scoring information (IQs and percentiles) will be supplied so that you can score yourself. Make your check or money order payable to "Ronald K. Hoeflin" and send it to the address given above. Non-U.S. participants should only use checks or money orders payable in U.S. dollars through a U.S. bank. Allow four to six weeks for a score report.

Verbal Analogies

It is an established fact that the larger one's vocabulary, the higher one's overall performance on an intelligence test is likely to be, and vice versa, perhaps because developing a good vocabulary requires curiosity, memory, and other important intellectual factors. For the first 25 problems, determine the word or prefix that best completes each analogy. Then find the first letter of that word or prefix among the five choices given and circle the letter that designates that choice on your answer sheet.

Example Cannibal : Anthropophagy :: Werewolf : ?

A) C B) J C) L D) P E) S

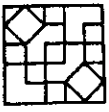
The best answer is Lycanthropy, the first letter of which is L, so you would circle the letter C on your answer sheet, since L follows C in the five choices given.

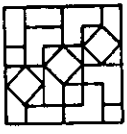
1.	Sword : Damocles :: Bed : ?	A)	B)	C)	D)	E)
2.	Eye : Ophthalmo- :: Navel : ?	A)	B)	C)	D)	E)
3.	Strip : Möbius :: Bottle : ?	A)	B)	C)	D)	E)
4.	Sum : Sigma :: Product : ?	A)	B)	C)	D)	E)
5.	Tire : Retread :: Parchment : ?	A)	B)	C)	D)	E)
6.	Pebble : Ripple :: Earthquake : ?	A)	B)	C)	D)	E)
7.	Leg : Ambulate :: Arm : ?	A)	B)	C)	D)	E)
8.	4 : Hand :: 9 : ?	A)	B)	C)	D)	E)
9.	All is one : Monism :: All is self : ?	A)	B)	C)	D)	E)
10.	Celebrity : Sycophantic :: Wife : ?	A)	B)	C)	D)	E)
11.	Victory (279 B.C.) : Pyrrhic :: Village (1787 A.D.) :	A)	B)	C)	D)	E)
12.	Ranch : Brand :: Book publishing house : ?	A)	B)	C)	D)	E)
13.	Easy job : Sinecure :: Guiding light : ?	A)	B)	C)	D)	E)
14.	Hear : Temporal :: See : ?	A)	B)	C)	D)	E)
15.	753 B.C. (geopolitics) : Roman Empire :: 1054 A.D. (astrophysics) : ?	A)	B)	C)	D)	E)
16.	Mosquitoes : Malaria :: Cannibalism : ?	A)	B)	C)	D)	E)
17.	One by one in succession : Seriatim :: Here and there throughout : ?	A)	B)	C)	D)	E)
18.	Gold : Malleable :: Chalk : ?	A)	B)	C)	D)	E)
19.	Physics applied to astronomy : Astrophysics :: Economics, statistics, etc. applied to history : ?	A)	B)	C)	D)	E)
20.	The set of sets that are not members of themselves : Russell :: The darkness of the night sky : ?	A)	B)	C)	D)	E)
21.	Teaching : Pedagogic :: Uplifting : ?	A)	B)	C)	D)	E)
22.	Sweetness : Suffix :: Boatswain : ?	A)	B)	C)	D)	E)
23.	The universe : Cosmo- :: Universal laws : ?	A)	B)	C)	D)	E)
24.	Absolutely certain : Apodeictic :: For rhetorical effect : ?	A)	B)	C)	D)	E)
25.	Language game : Ludwig :: Piano concerti for the left hand : ?	A)	B)	C)	D)	E)

Spatial and Numerical Problems

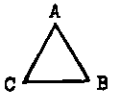
Overlapping squares: The pattern at right can be formed by using three squares lying flat on top of one another, as indicated by the numberings. For the following three problems determine the minimum number of squares--unmarked, unfolded, uncut, and opaque--lying flat on top of one another that are sufficient to create the patterns shown.

26.  A) B) C) D) E)

27.  A) B) C) D) E)

28.  A) B) C) D) E)

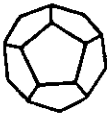
Crawling ants: Suppose there is an ant at each of the three vertices of an equilateral triangle--A, B, and C--as illustrated at right, and suppose the three ants simultaneously and at the same speed crawl along one of the edges of the triangle until coming to the next vertex. There are only two cases in which the ants will not encounter one another: if they all go left, LLL, or all go right, RRR. For the other six possibilities--LLR, LRL, RLL, LRR, RRL, and RLR--two of the ants will encounter one another. Thus, if each ant is just as likely to go right as it is to go left, the probability that no two ants will meet one another is 2/8. The following three problems test your ability to apply this lesson to more complex situations. You are to suppose that there is an ant at each vertex of a polyhedron, all of whose edges are of equal length, and that the ants all proceed simultaneously and with equal speed along any of the edges that meet at its initial vertex until it arrives at the next vertex, choosing with equal probability among the directions available to it. You are given for each polyhedron the denominator of the fraction that specifies the probability that no two ants will meet (either en route or at the next vertex) and your task is to determine the numerator. For instance, in the example of the triangle the solution is x/8, where x = 2.



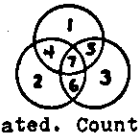
29. For the tetrahedron, depicted at right, the solution is x/81, where x = ? A) B) C) D) E)

30. For the cube, depicted at right, the solution is x/6561, where x = ? A) B) C) D) E)

31. For the dodecahedron, depicted at right, the solution is x/3,486,784,401, where x = ? A) B) C) D) E)



Interpenetrations: When two or more spatial figures interpenetrate, they may divide one another into a number of smaller pieces. Illustrated at right are three interpenetrating circles, yielding seven pieces. For each of the following problems, find the maximum number of pieces that can be formed by the particular combination of figures indicated. Count only pieces that are not further subdivided. You may freely vary the sizes of the figures in order to produce the maximum number of pieces, but none of the figures or their parts may be infinitely large or infinitessimally small.



32. How many bounded areas can be formed by the interpenetration of three circles and two triangles?
A) B) C) D) E)

33. How many bounded volumes can be formed by the interpenetration of a cube and a tetrahedron?
A) B) C) D) E)

34. Suppose you have a torus shaped like the inner tube of a tire, i.e., formed by rotating a circle about an axis in its plane that does not intersect the circle. Now suppose there are three Möbius strips, each looped once about the interior of the torus and interpenetrating one another, each having a 180° twist that is evenly distributed along the entire length of the strip. What is the maximum number of bounded volumes that can be formed?
A) B) C) D) E)

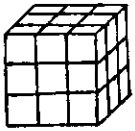
Painted polyhedra: Suppose each side of a cube is painted either white or black. The cube can be painted in ten distinct ways: (1) all sides white, (2) all sides black, (3) one side white and the rest black, (4) one side black and the rest white, (5) two opposite sides white and the rest black, (6) two opposite sides black and the rest white, (7) two sides that meet along an edge white and the rest black, (8) two sides that meet along an edge black and the rest white, (9) three sides that all meet at one point white and the rest black, and (10) three sides that do not all meet at one point white and the rest black. In how many distinct ways can the following polyhedra be painted:

35. A cube, each of whose sides is divided into two equal triangles by a diagonal line as illustrated at right, each triangle being painted either white or black, considering all possible orientations of the diagonals?
A) B) C) D) E)

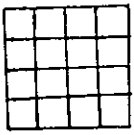
36. An octahedron, illustrated at right, whose eight sides are equilateral triangles of identical size, with each side painted either white or black?
A) 20 or less B) 21 or 22 C) 23 or 24 D) 25 or 26 E) 27 or more

37. An icosahedron, illustrated at right, whose twenty sides are equilateral triangles of identical size, with each side painted either white or black?
A) B) C) D) E)

Building blocks:



38. Suppose the figure at right represents 144 steel girders of equal length that are floating in space and that form a large cubical shape consisting of 27 smaller cubical modules. Suppose all but 12 of the girders are removed. The remaining 12 girders each remain attached at each end to the end of at least one of the other remaining girders, and all 12 girders form a single, interconnected structure. If none of the 12 girders is moved from the position it initially occupied when all 144 girders were together, how many distinct geometrical shapes can the 12 girders jointly possess? (If any two shapes can be made identical by a rigid rotation of either shape as a whole, then they are to be counted as a single shape rather than as two distinct shapes.)
A) B) C) D) E)



39. Suppose there are 16 square tiles of identical size arranged in a square pattern on a floor as depicted at right. Suppose 10 of these squares are removed, leaving 6 tiles. These 6 tiles are interconnected in such a way that one could have laid them one by one, with each new tile in contact with one of the previously laid tiles along at least one of its edges, not just at a corner. How many distinct shapes can these 6 tiles possess? (If any two shapes can be made identical by a rigid rotation of either shape as a whole without raising it off the floor or moving the floor itself, then they are to be counted as a single shape rather than as two.)
A) B) C) D) E)

40. Suppose there are 27 cubical blocks of identical size stacked in a cubical stack such as is depicted in problem 44. Suppose any three of the blocks are removed. (The central or core block can be removed without removing any of the six blocks that enclose it on its six sides.) How many distinct shapes can the remaining 24 blocks possess? (If any two shapes can be made identical by a rigid rotation of either shape as a whole, then they are to be counted as a single shape rather than as two.)
A) B) C) D) E)

Interpenetrations, Part Two: These problems are like the earlier set of interpenetration problems, only more difficult. Again you are to determine the maximum number of pieces that can be formed from the interpenetration of the figures indicated. Here, all the pieces are volumes.

41. One tetrahedron and four spheres.
A) B) C) D) E)

42. Two right circular cones (i.e., cones having a circular surface for their base which is at right angles to the central axis of the cone) and a torus (of the sort described in problem 34, but excluding the Möbius strips).
A) B) C) D) E)

43. Two right circular cones and one right circular cylinder (a right circular cylinder having a circular surface at each end, both at right angles to the central axis of the cylinder).
A) B) C) D) E)

Number sequences: What number best continues each of the following sequences:

44. 2 15 1,001 215,441 ?
A) B) C) D) E)

45. 5 3 5 6 2 9 5 1 4 1 ?
A) B) C) D) E)

46. 1 6 7 14 15 24 41 44 55 64 ?
A) B) C) D) E)

Miscellaneous problems:

47. If a lump of clay is shaped like a tetrahedron and is sliced six times by perfectly straight (i.e., planar) knife strokes, none of the pieces thus formed ever being rearranged, what is the maximum number of tetrahedral lumps of clay that can be formed in this way, counting only pieces that are not further subdivided?
A) B) C) D) E)

48. Given bottles that, when full, contain 50, 27, and 7 cubic centimeters of fluid, respectively, how many movements are necessary, at minimum, to arrive at 38 cubic centimeters of water in the largest bottle if one starts with empty bottles and can perform three types of movements: (1) fill any one bottle to the top with water from a faucet, (2) transfer water from one bottle to another, stopping only when the first bottle is empty or the second one is full, and (3) completely empty any one bottle by pouring its contents down a drain?
A) B) C) D) E)

49. Suppose there are tens of thousands of boxes in a room, each containing ten marbles of identical size and texture. Each marble is black or white, the color of each marble being determined by the flip of a coin (i.e., randomly) beforehand, heads resulting in the placement of a white marble and tails in the placement of a black one. After placement in a box, a marble's color cannot be determined except by removing it from the box for inspection. Suppose one of the boxes is chosen at random and marbles are removed from the box one by one for inspection, each being returned to the box and mixed thoroughly with the other marbles before another marble is removed for inspection. Suppose one inspects ten marbles in succession in this way and all turn out to be white. What is the probability to the nearest percent that all ten marbles in the box are white?
A) B) C) D) E)

50. A cube has eight vertices, twelve edges, six sides, and one volume, and, as indicated previously, if each side is painted either white or black, then ten distinct patterns are possible. A 4-dimensional hypercube has 16 vertices, 32 edges, 24 sides, 8 volumes, and one hypervolume. If each of the 32 sides is painted either white or black, how many distinct patterns are possible?
A) B) C) D) E)

END OF TEST

Answer Sheet

(For my records) (For your mailing label)

Name: _____ Name: _____

Address: _____ Address: _____

_____ _____

Age: _____ Sex: _____ Previous IQ and aptitude test scores (optional):

_____

_____

Your answers (circle one letter for each item, but do not guess wildly):

1.	A	B	C	D	E	26.	A	B	C	D	E
2.	A	B	C	D	E	27.	A	B	C	D	E
3.	A	B	C	D	E	28.	A	B	C	D	E
4.	A	B	C	D	E	29.	A	B	C	D	E
5.	A	B	C	D	E	30.	A	B	C	D	E
6.	A	B	C	D	E	31.	A	B	C	D	E
7.	A	B	C	D	E	32.	A	B	C	D	E
8.	A	B	C	D	E	33.	A	B	C	D	E
9.	A	B	C	D	E	34.	A	B	C	D	E
10.	A	B	C	D	E	35.	A	B	C	D	E
11.	A	B	C	D	E	36.	A	B	C	D	E
12.	A	B	C	D	E	37.	A	B	C	D	E
13.	A	B	C	D	E	38.	A	B	C	D	E
14.	A	B	C	D	E	39.	A	B	C	D	E
15.	A	B	C	D	E	40.	A	B	C	D	E
16.	A	B	C	D	E	41.	A	B	C	D	E
17.	A	B	C	D	E	42.	A	B	C	D	E
18.	A	B	C	D	E	43.	A	B	C	D	E
19.	A	B	C	D	E	44.	A	B	C	D	E
20.	A	B	C	D	E	45.	A	B	C	D	E
21.	A	B	C	D	E	46.	A	B	C	D	E
22.	A	B	C	D	E	47.	A	B	C	D	E
23.	A	B	C	D	E	48.	A	B	C	D	E
24.	A	B	C	D	E	49.	A	B	C	D	E
25.	A	B	C	D	E	50.	A	B	C	D	E