APPENDIX - G

RAVEN'S PROGRESSIVE MATRICES

ALONG WITH THE MANUAL

Standard Progressive Matrices

Sets A, B, C, D and E

(Revised Order 1956)

Prepared by J.C.Raven.M.sc.
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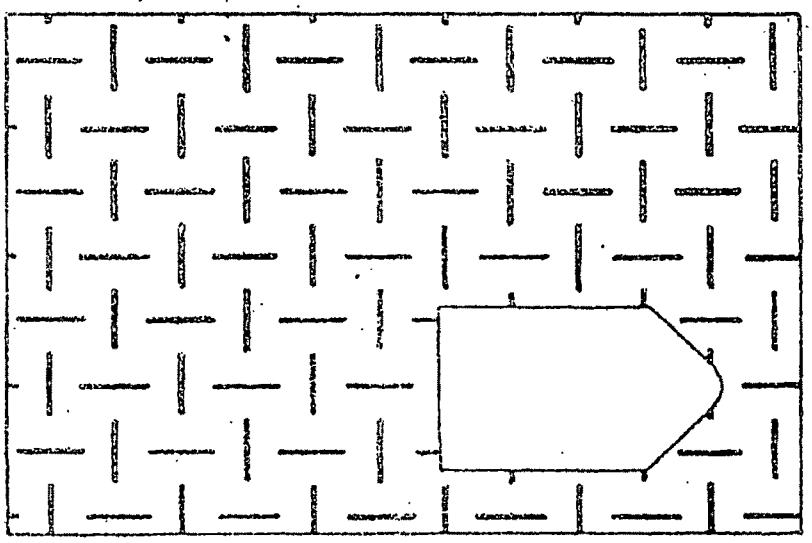
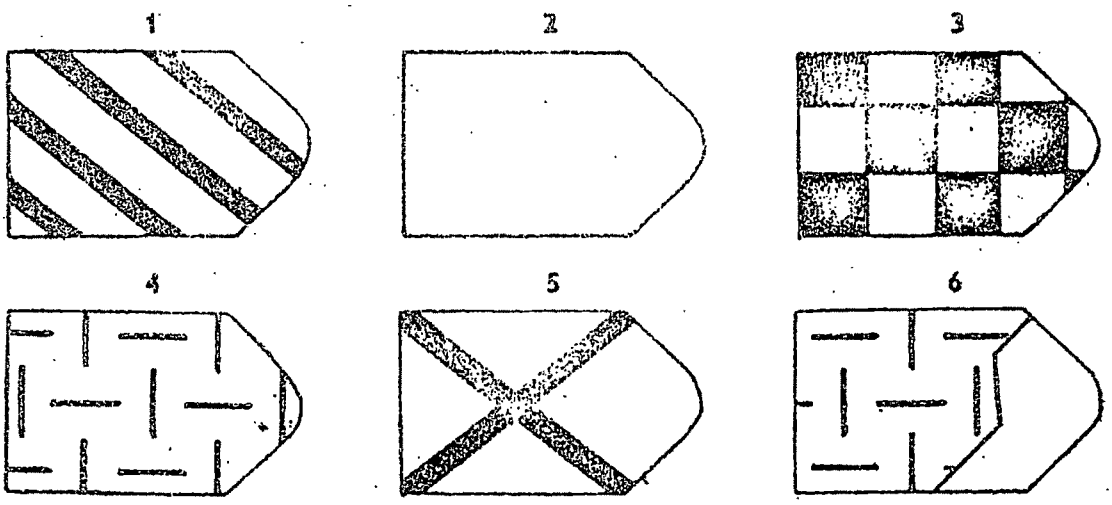
SET A

A 1





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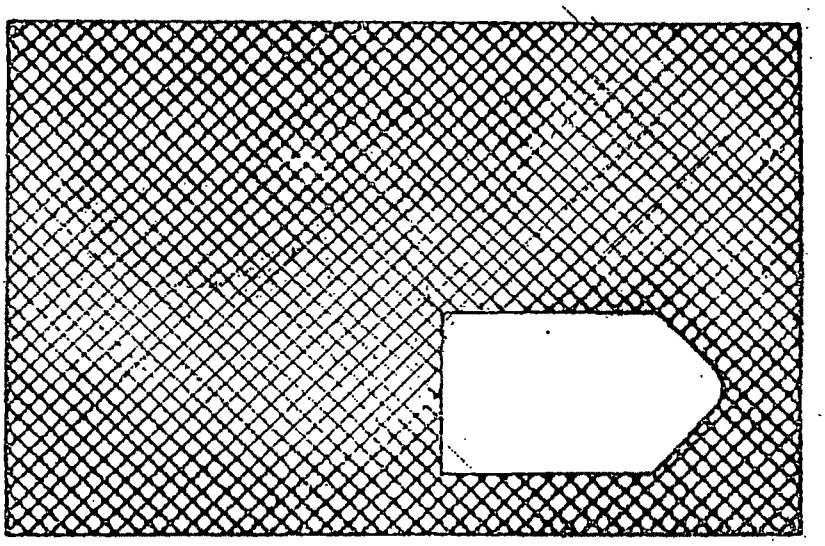

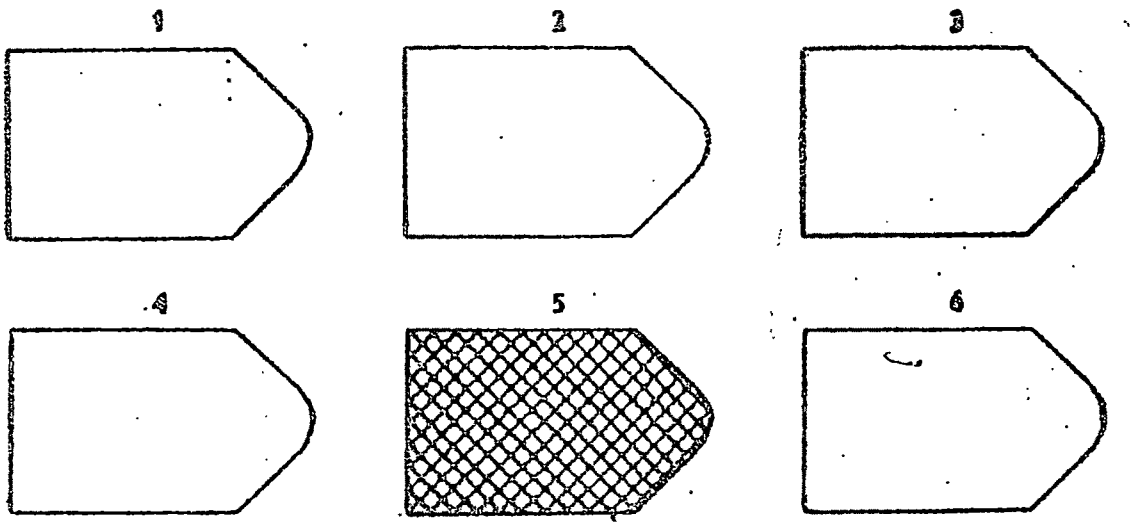

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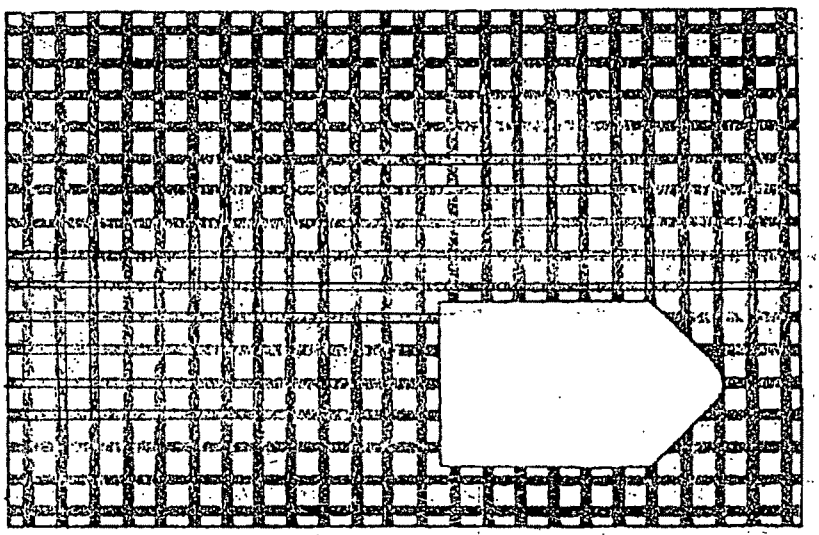

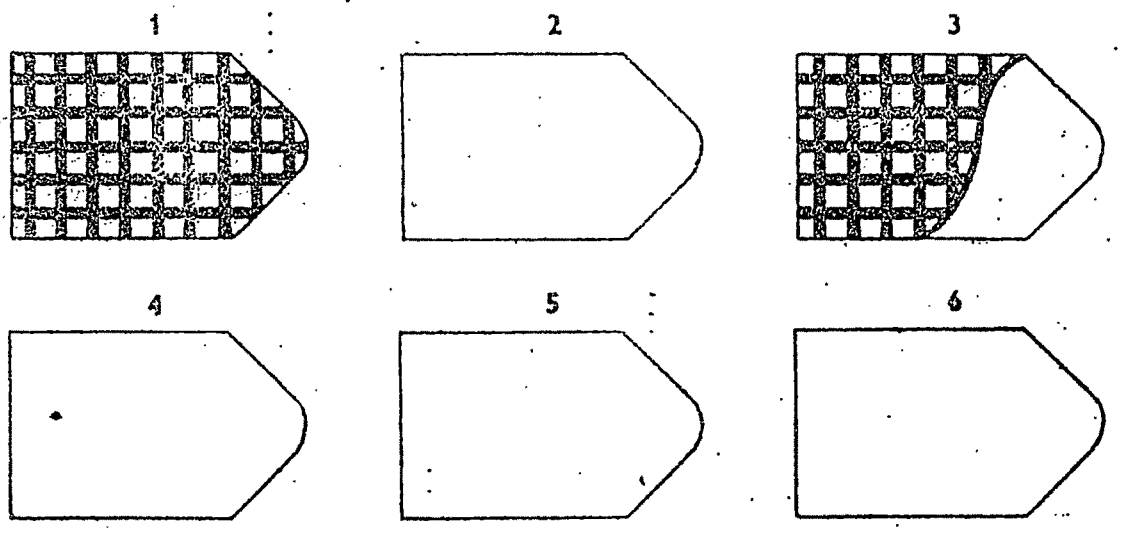

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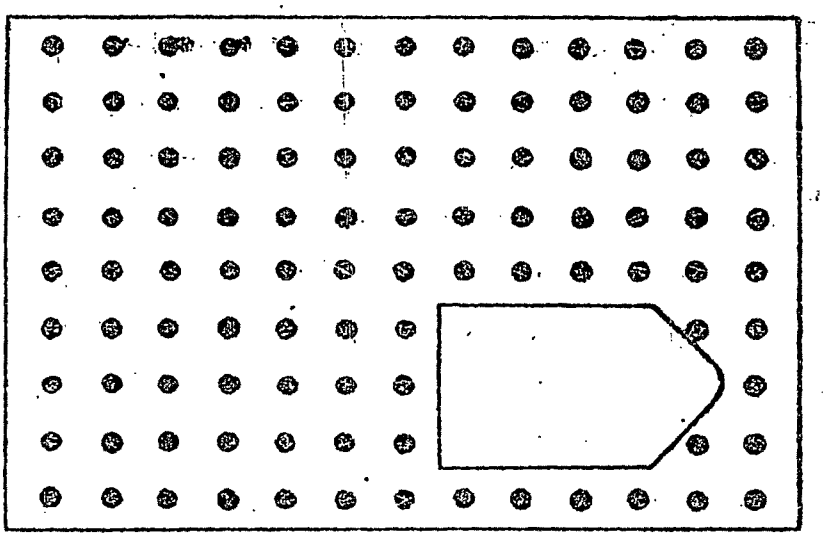

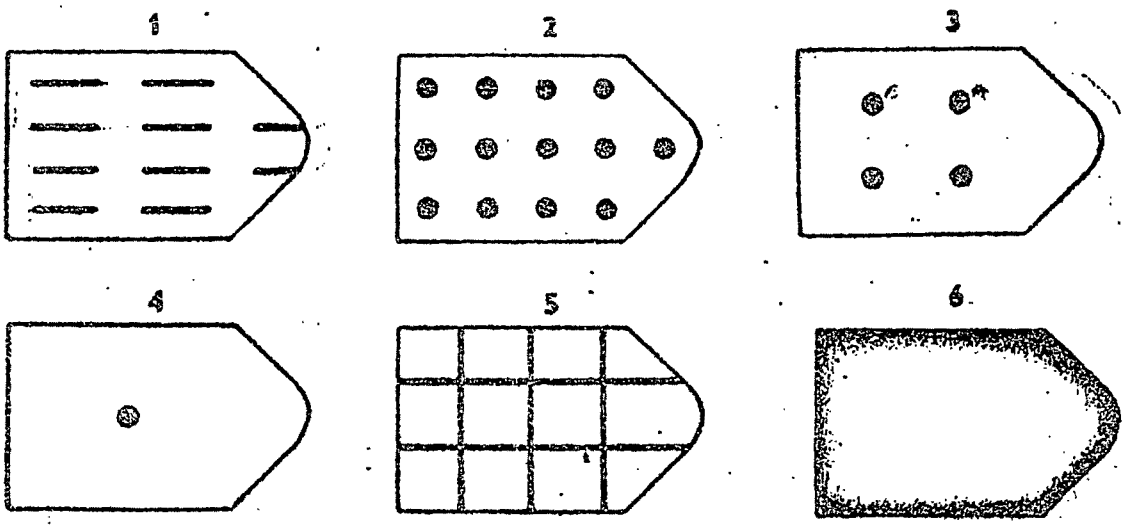

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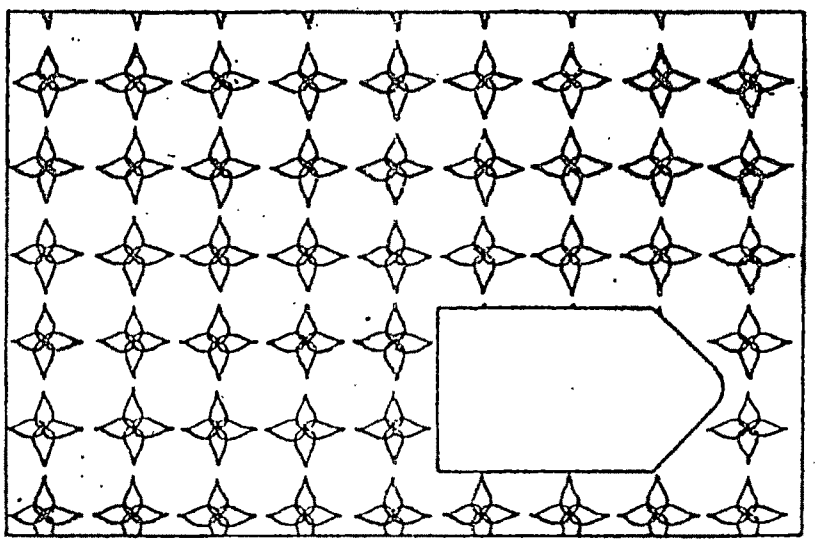

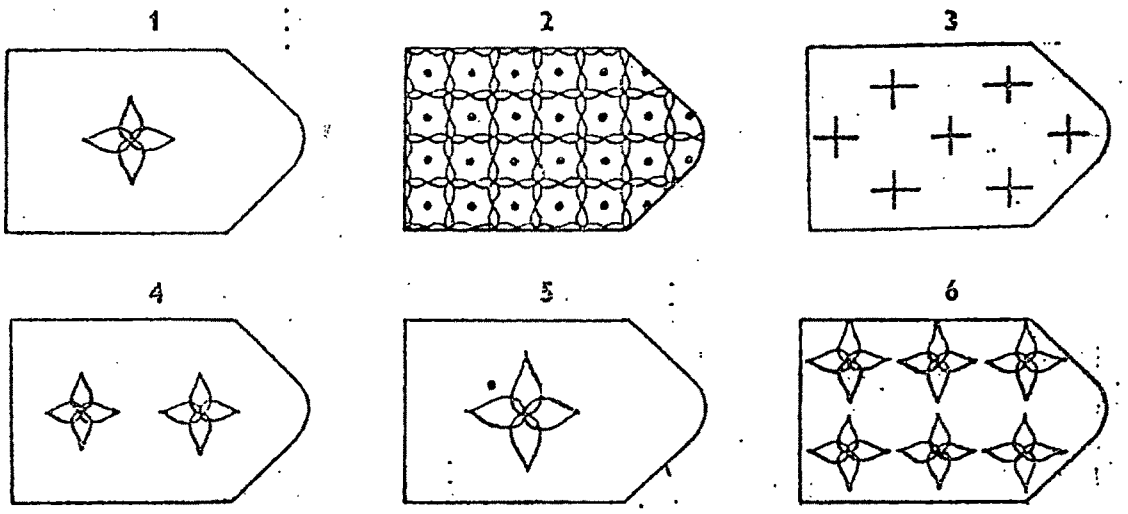

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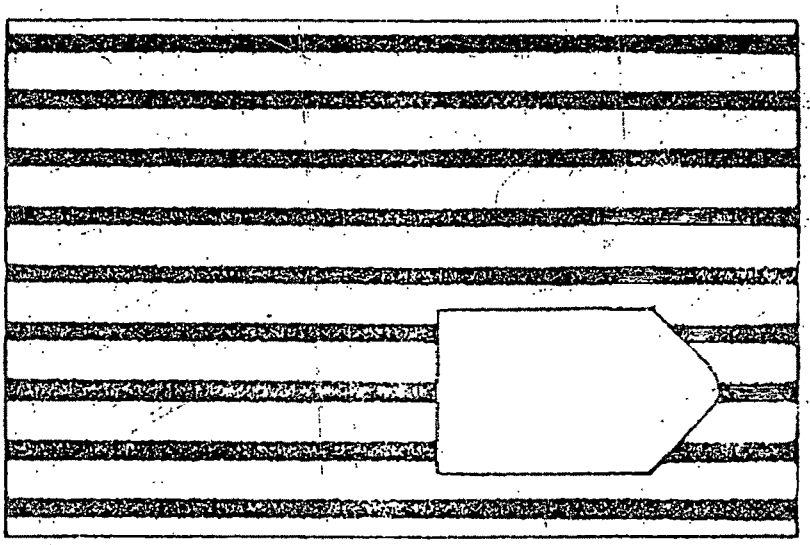

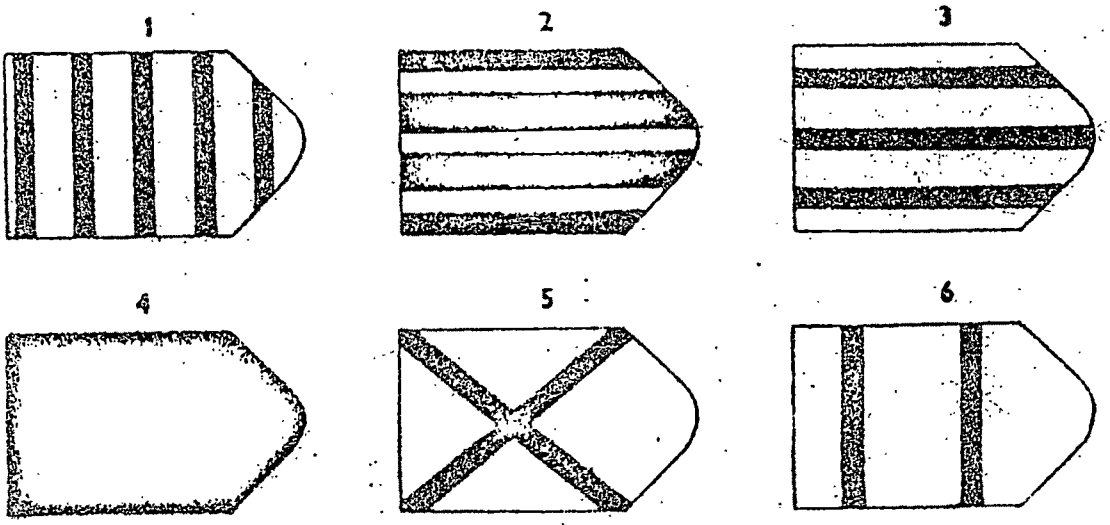

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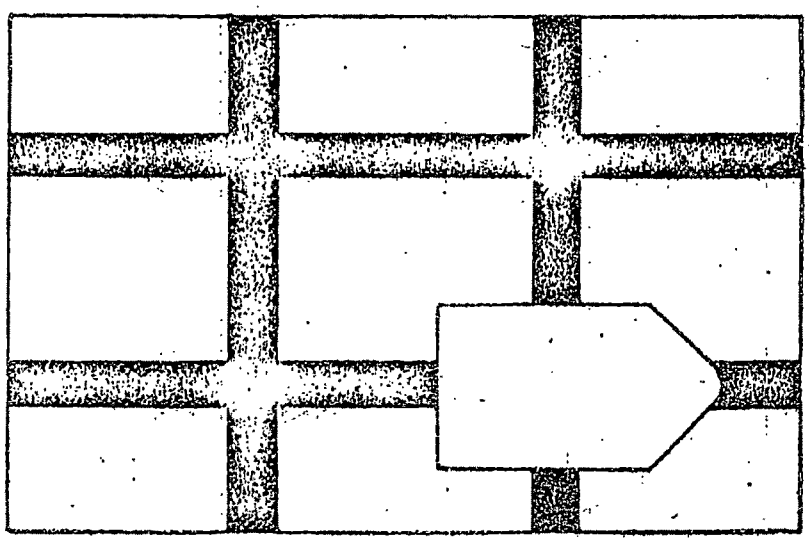

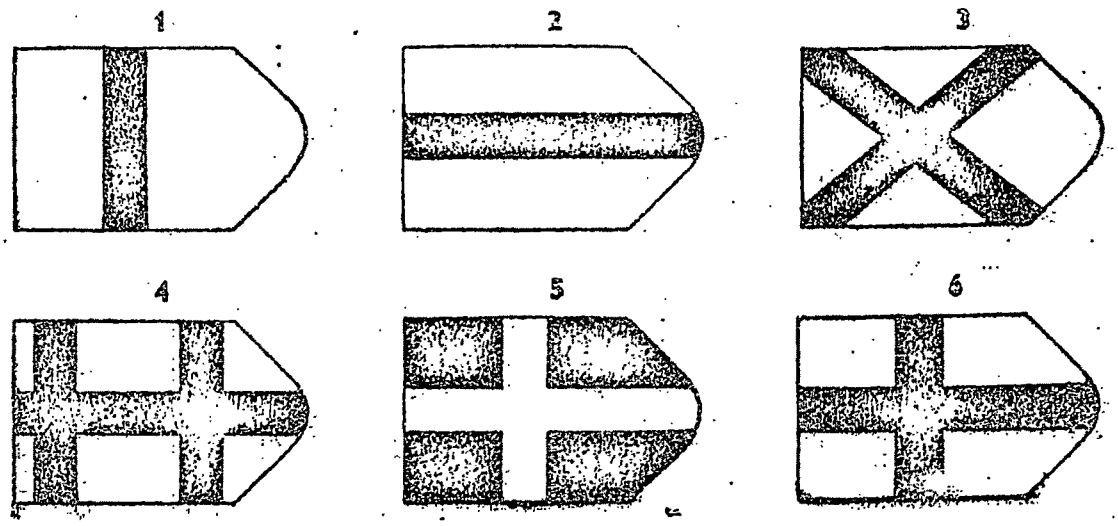

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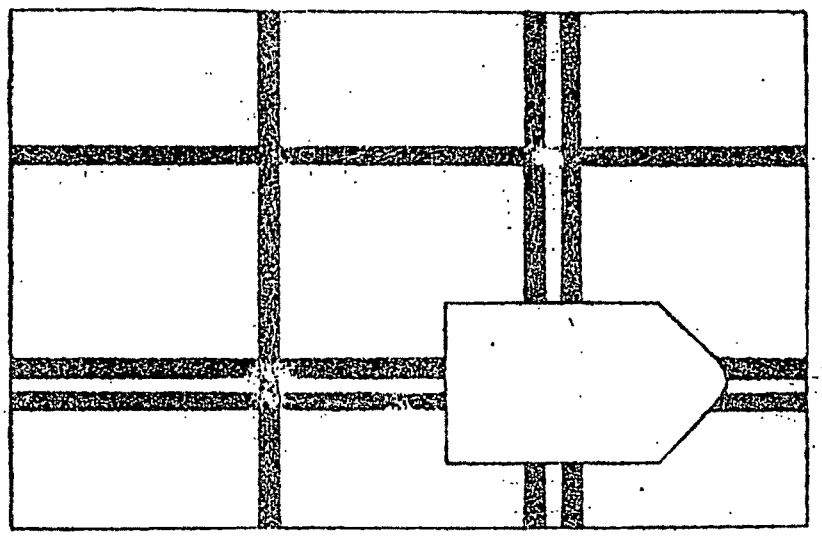

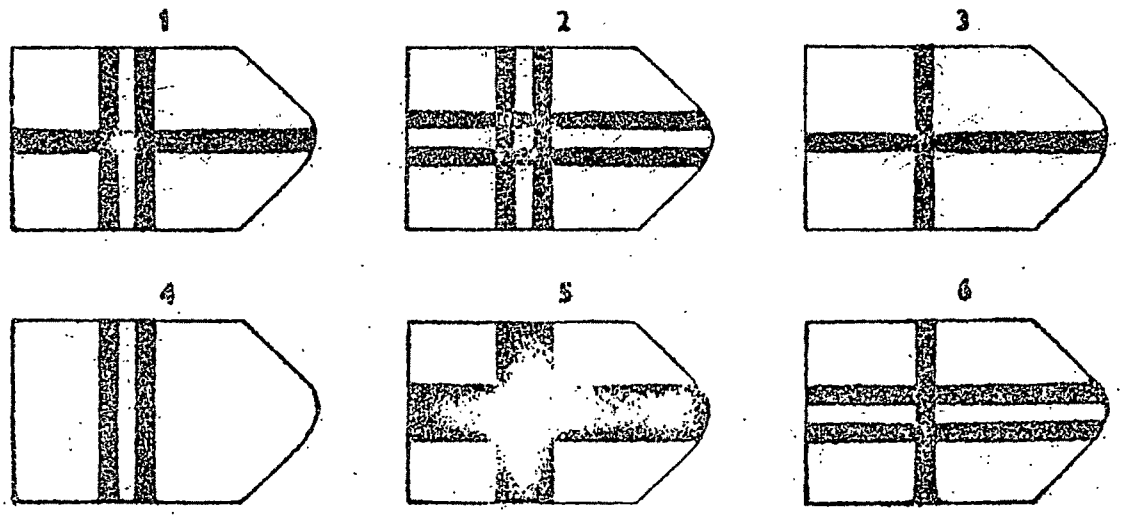

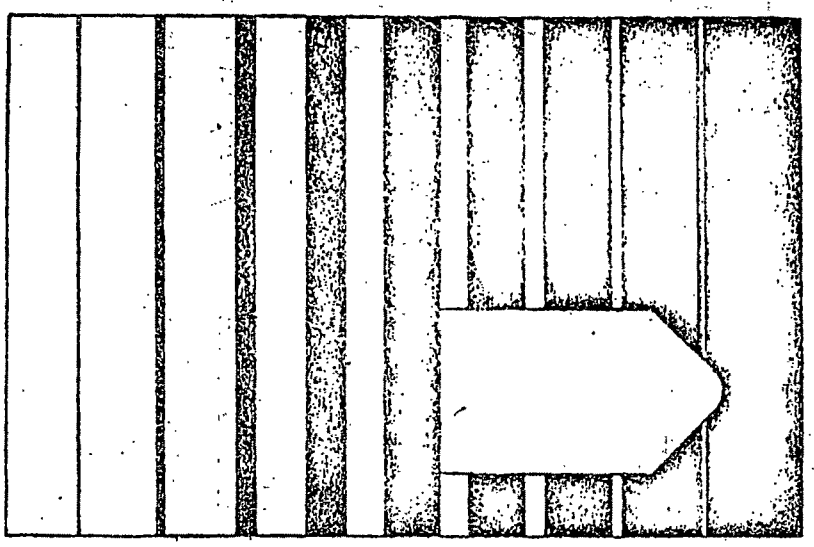

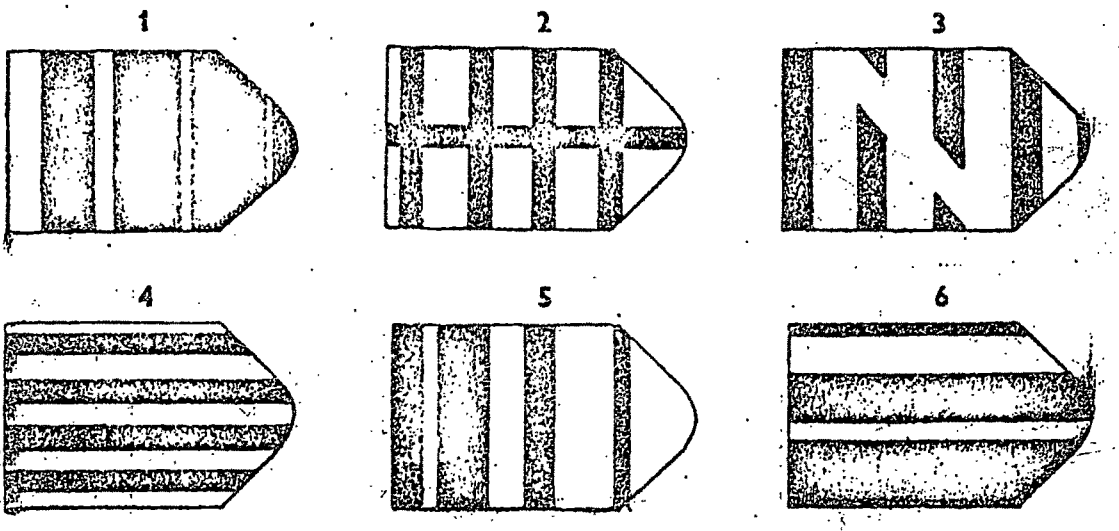
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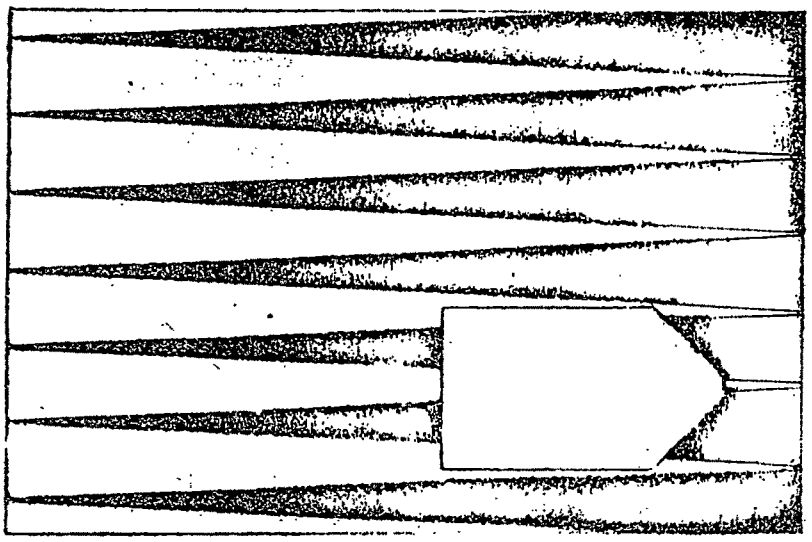
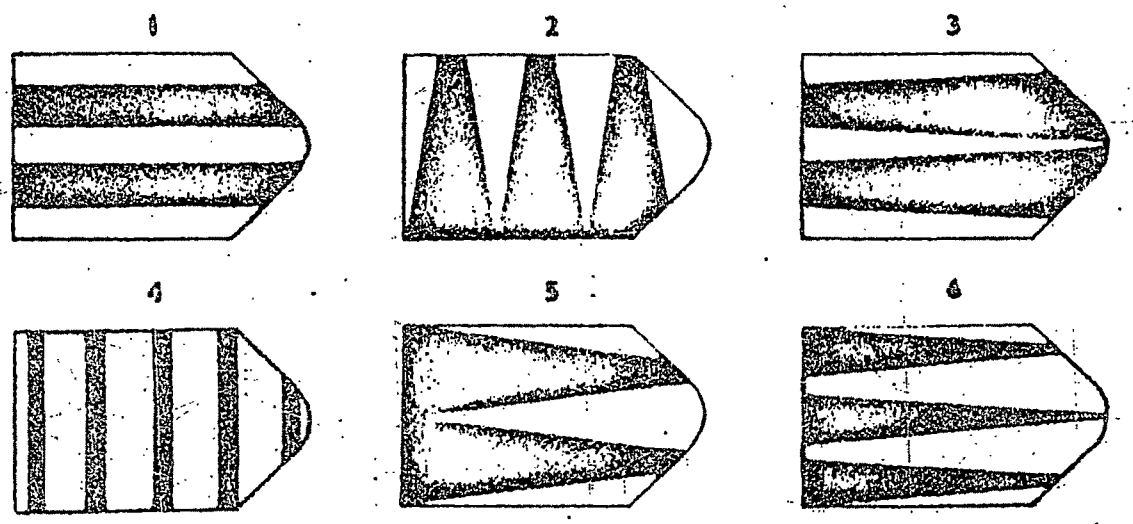
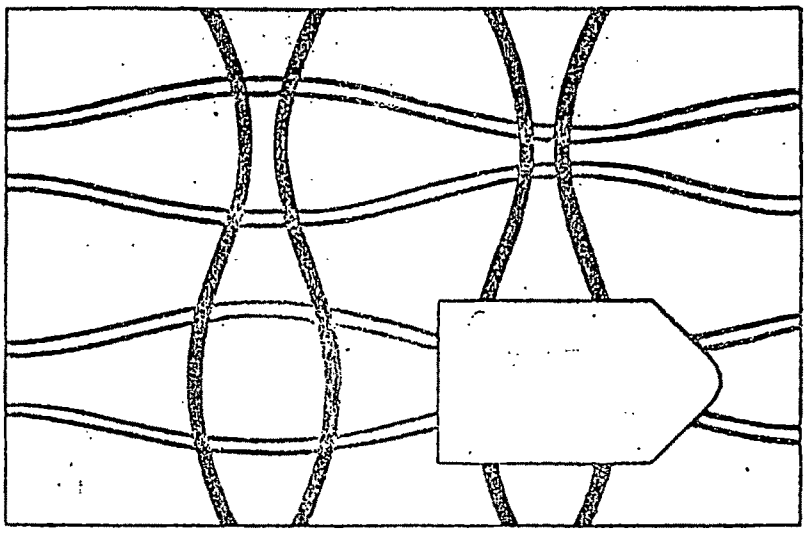
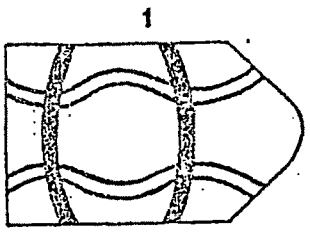
A 10





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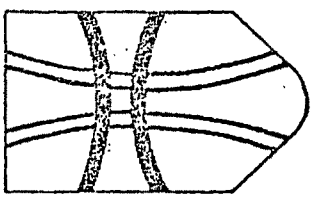
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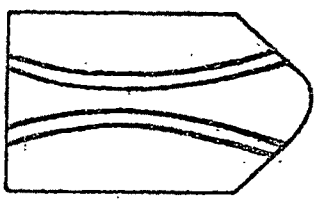
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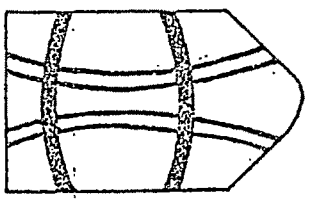
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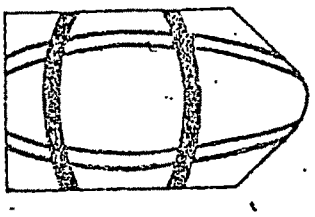
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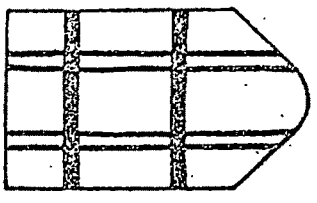
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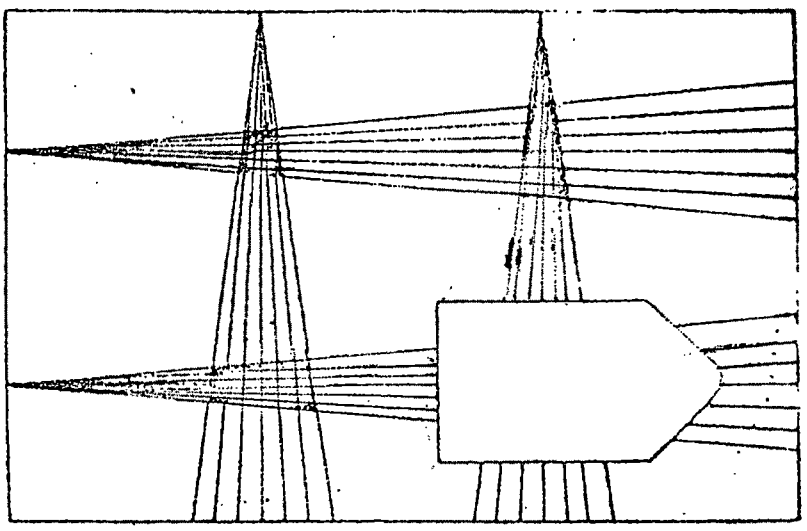

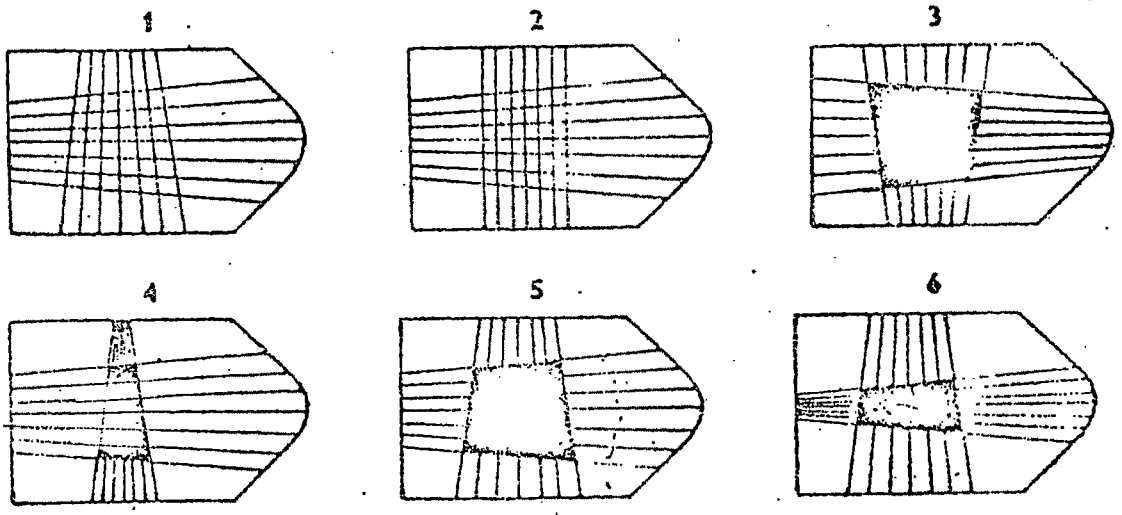
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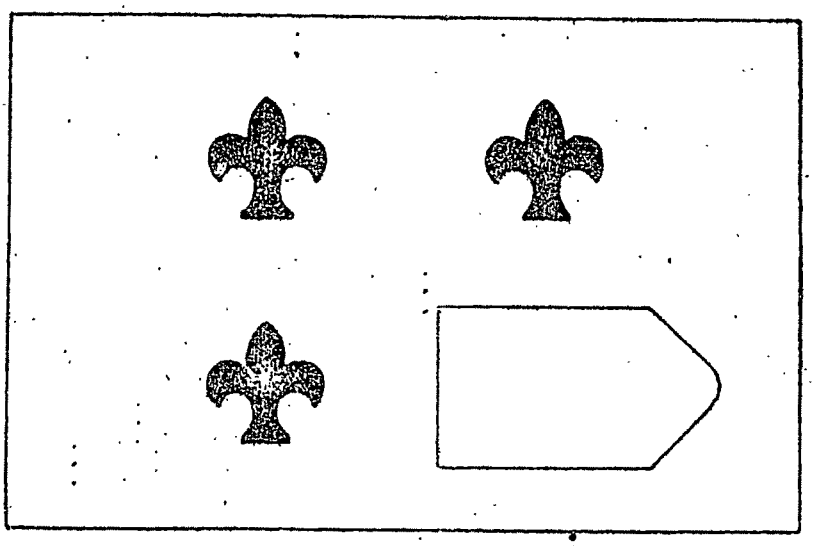

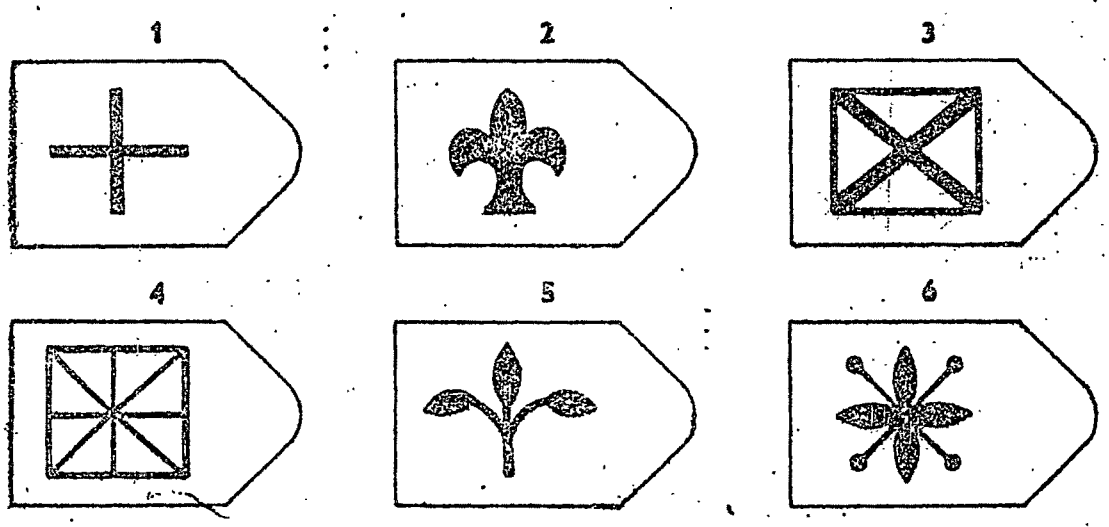

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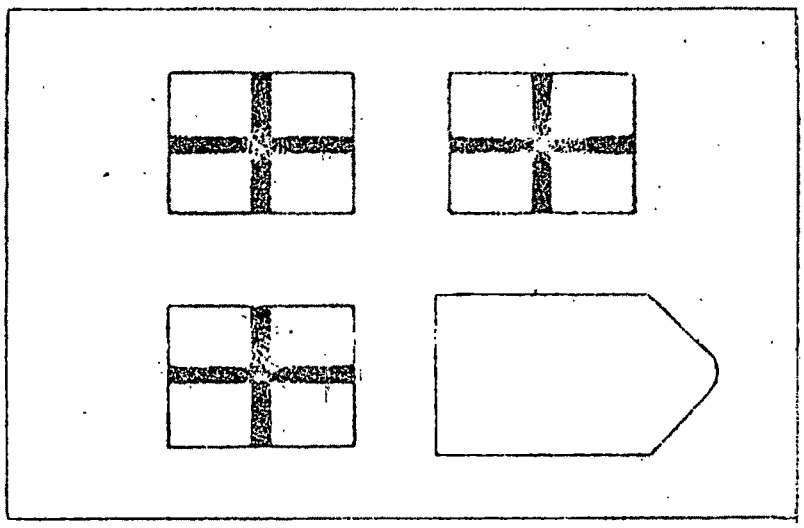

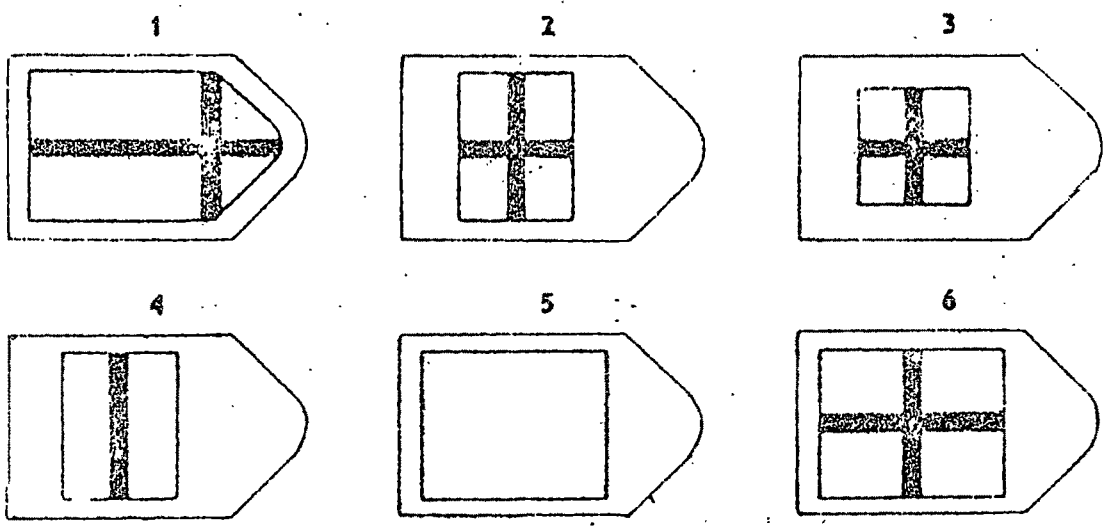

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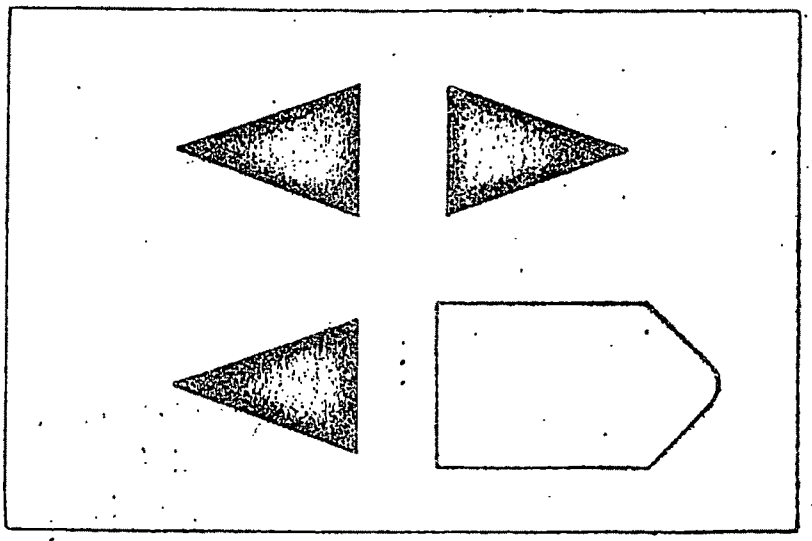

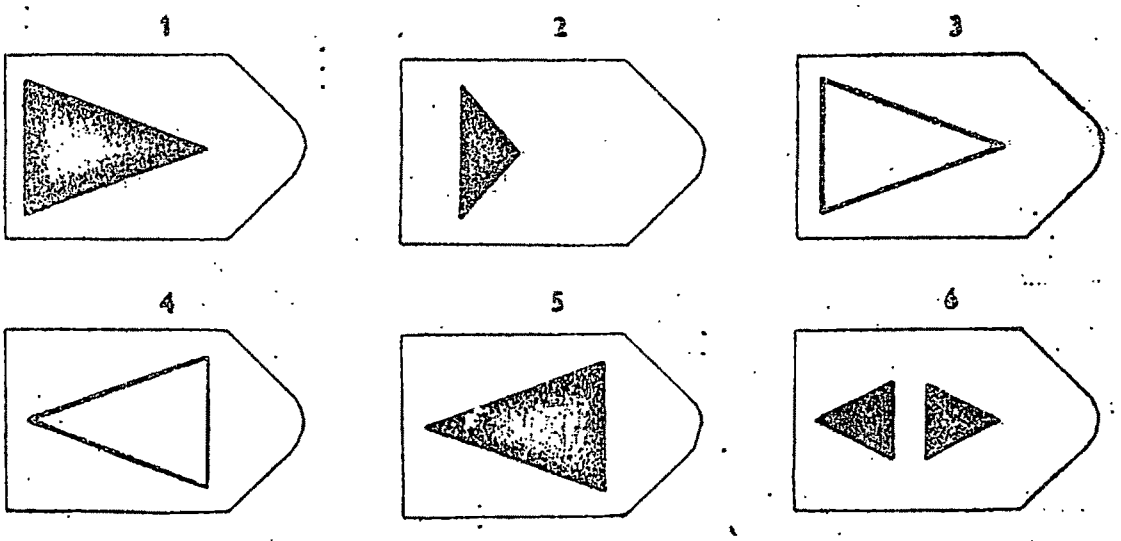

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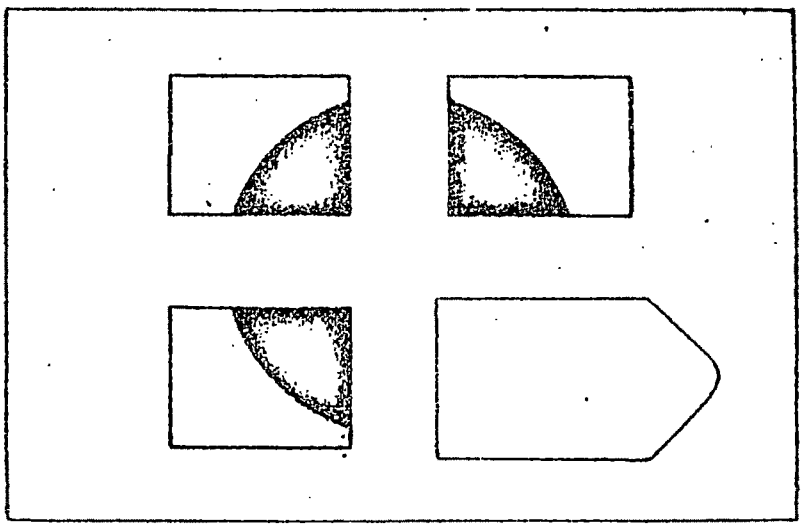

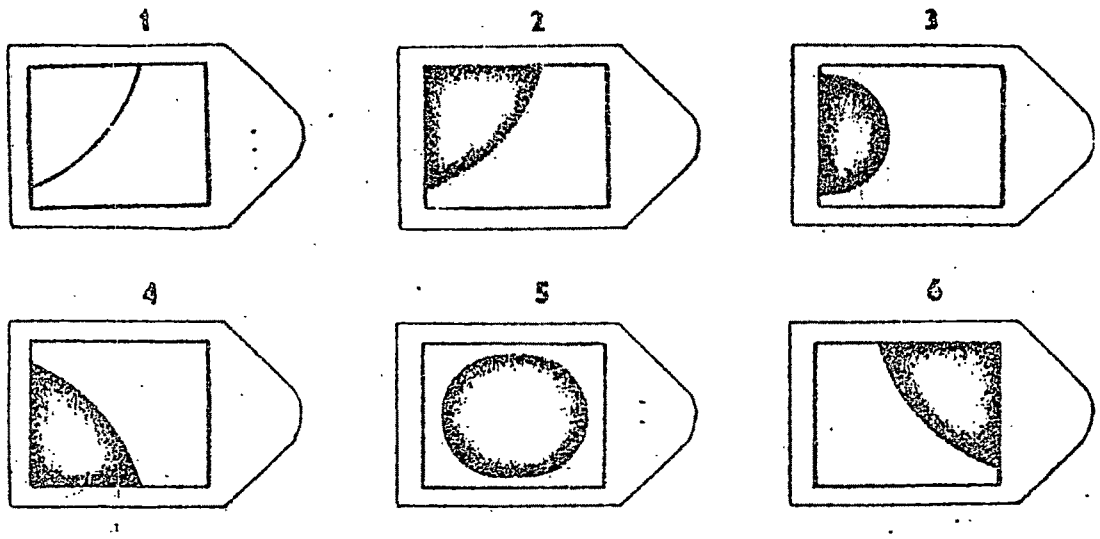

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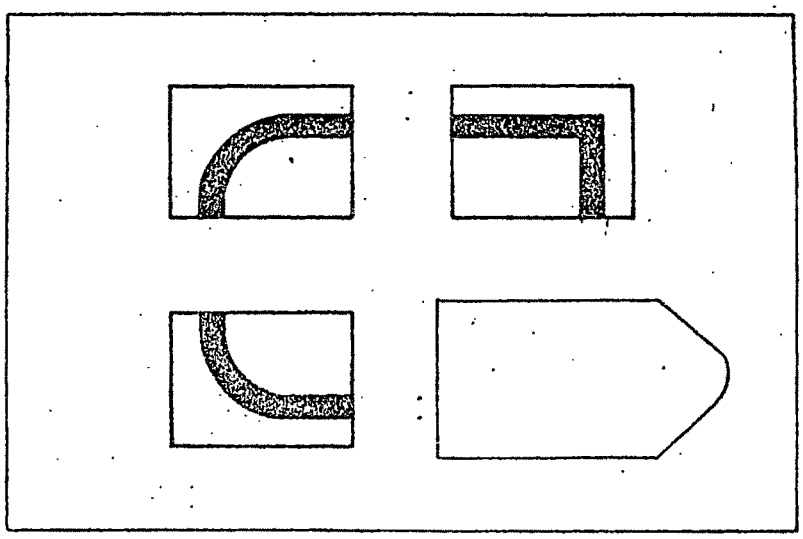

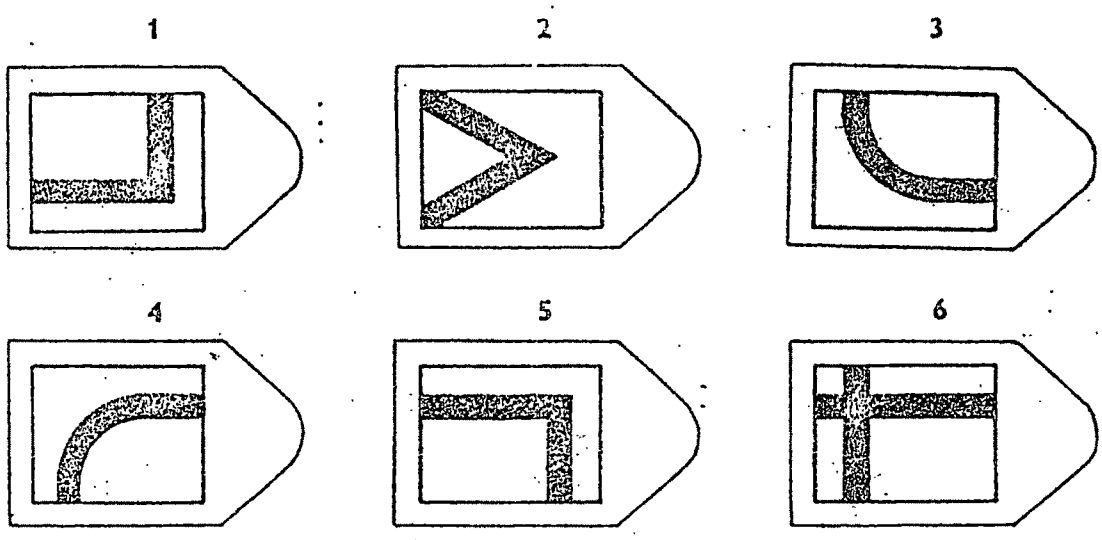

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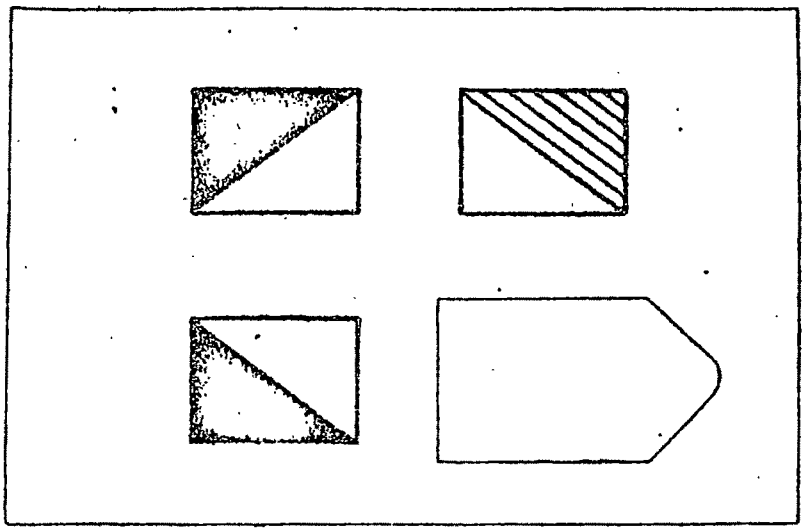

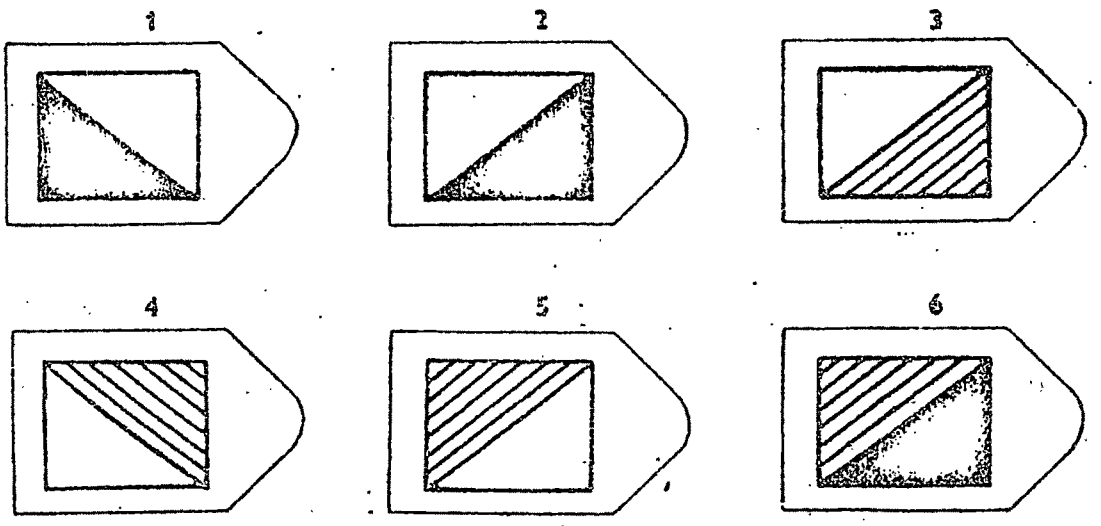

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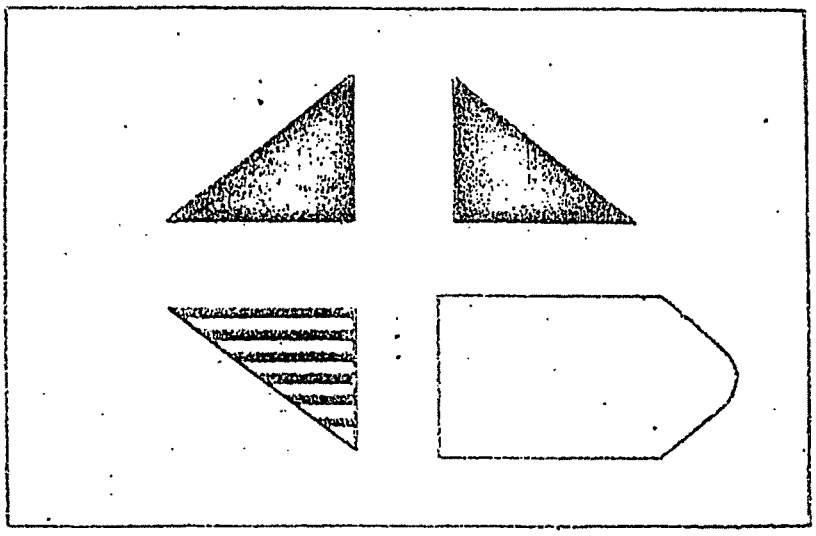

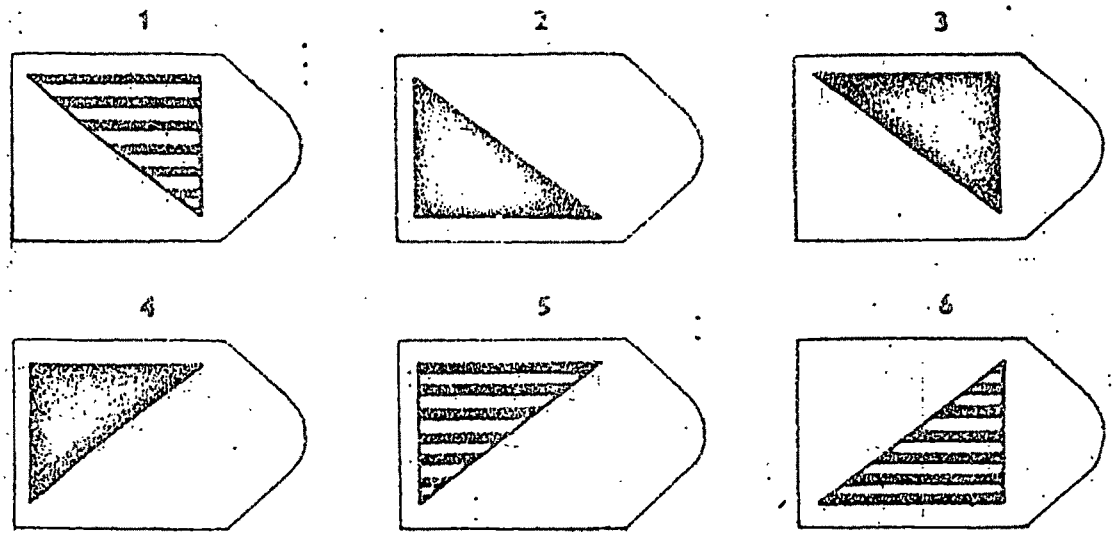

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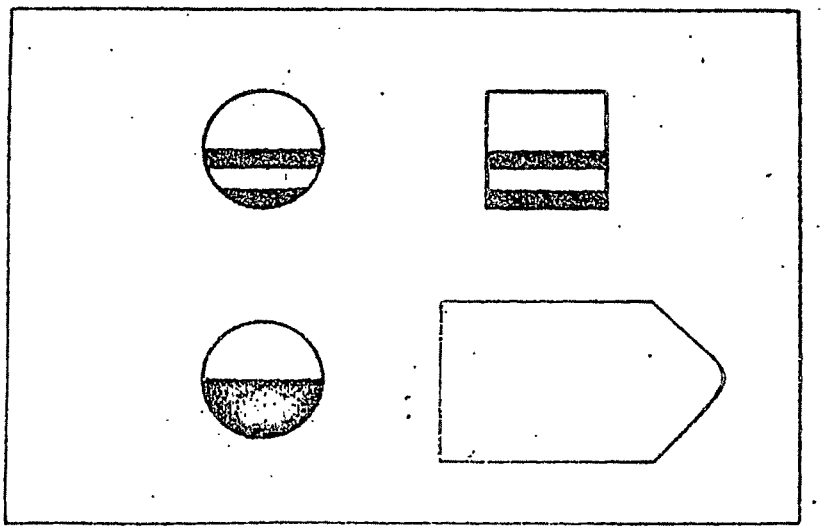

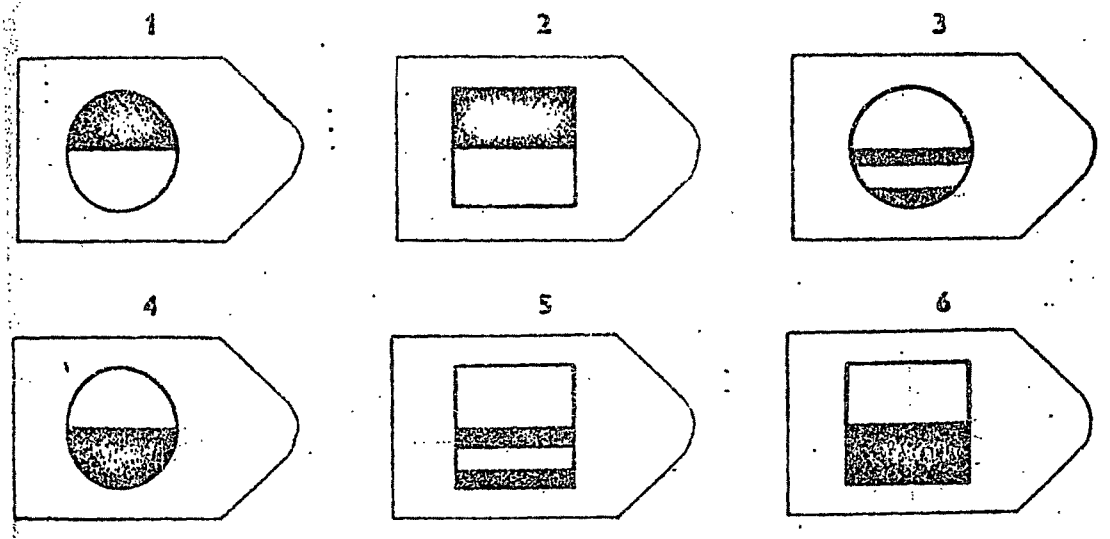

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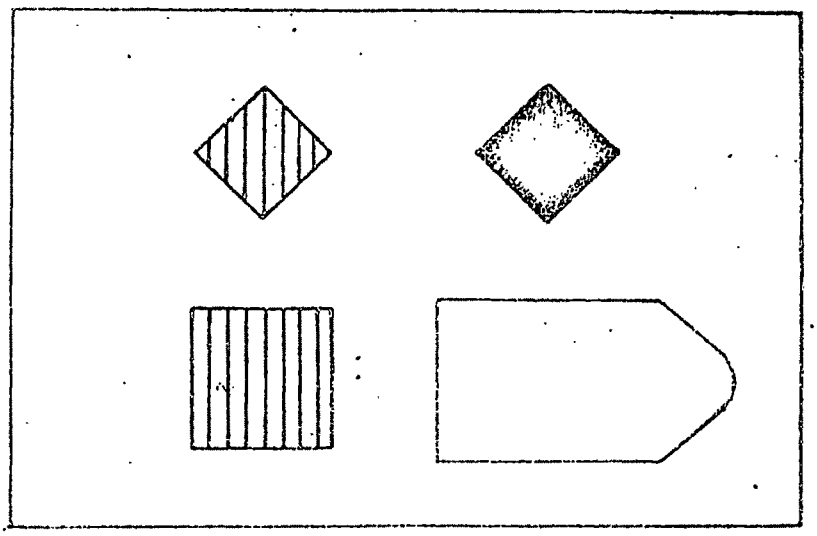

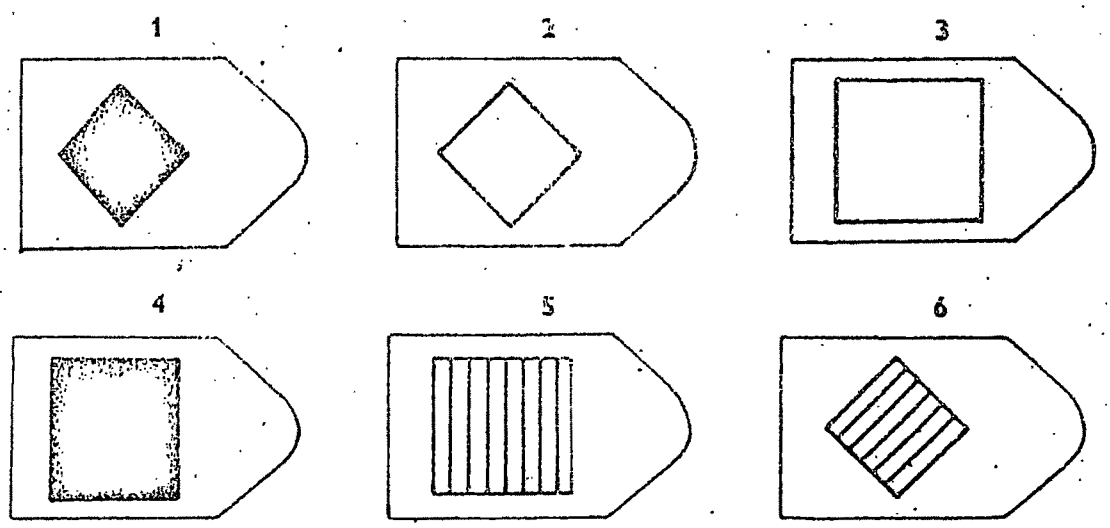

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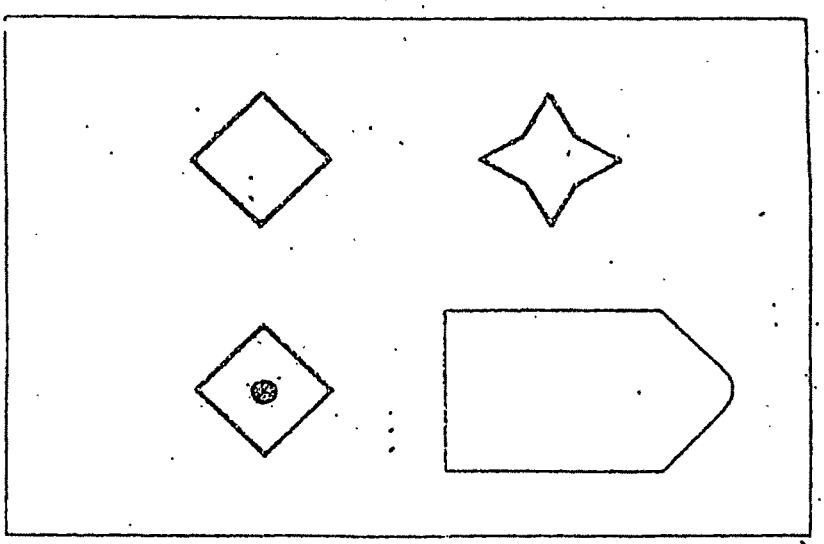

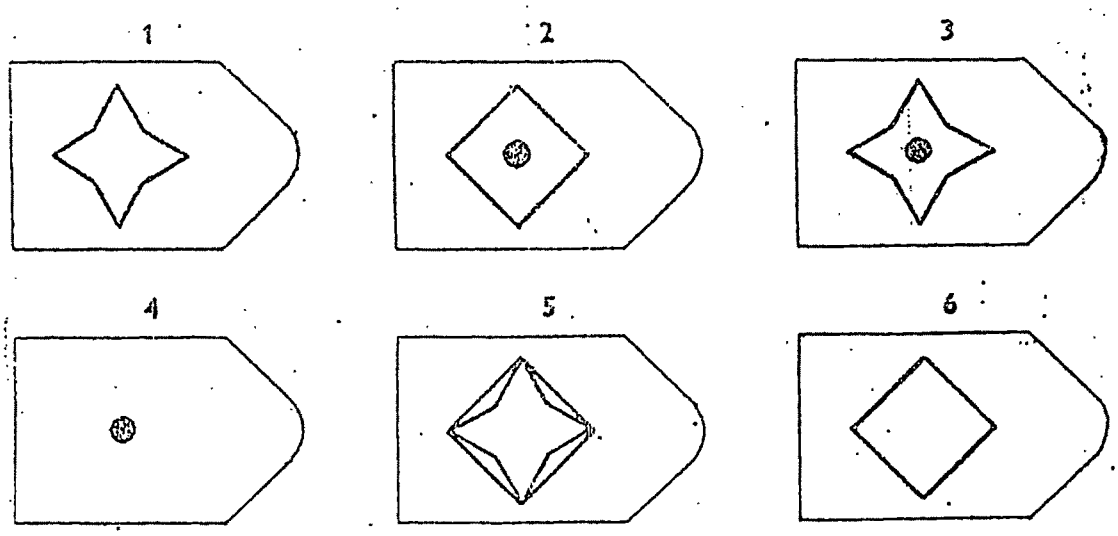

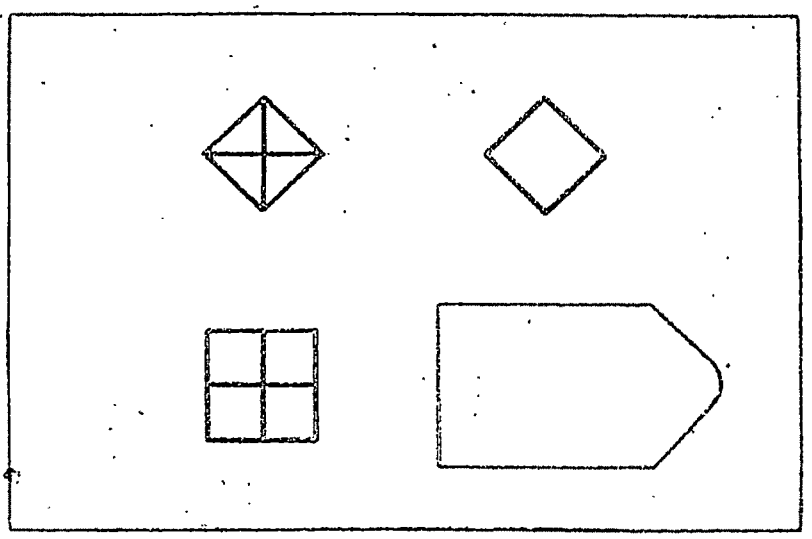

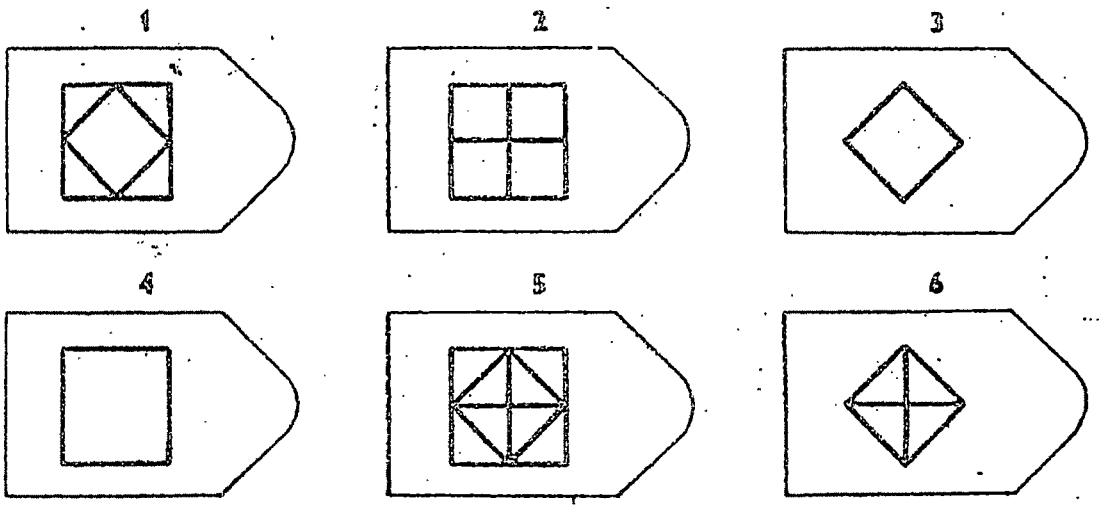
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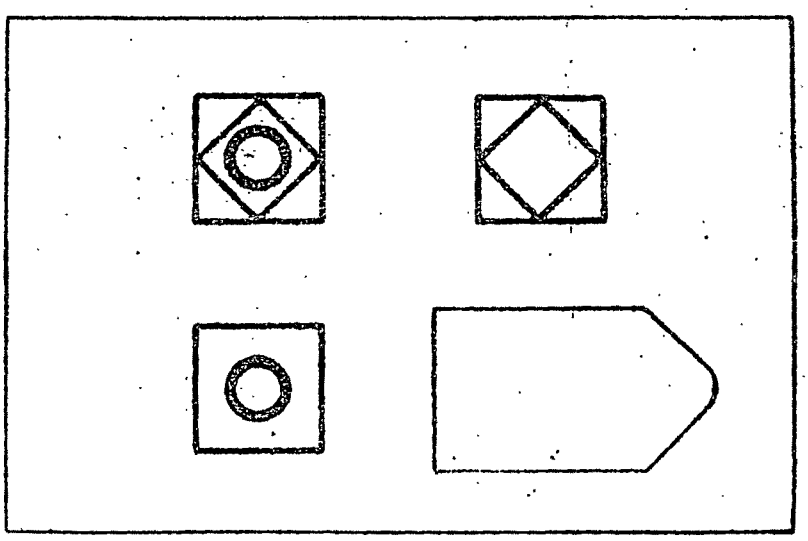
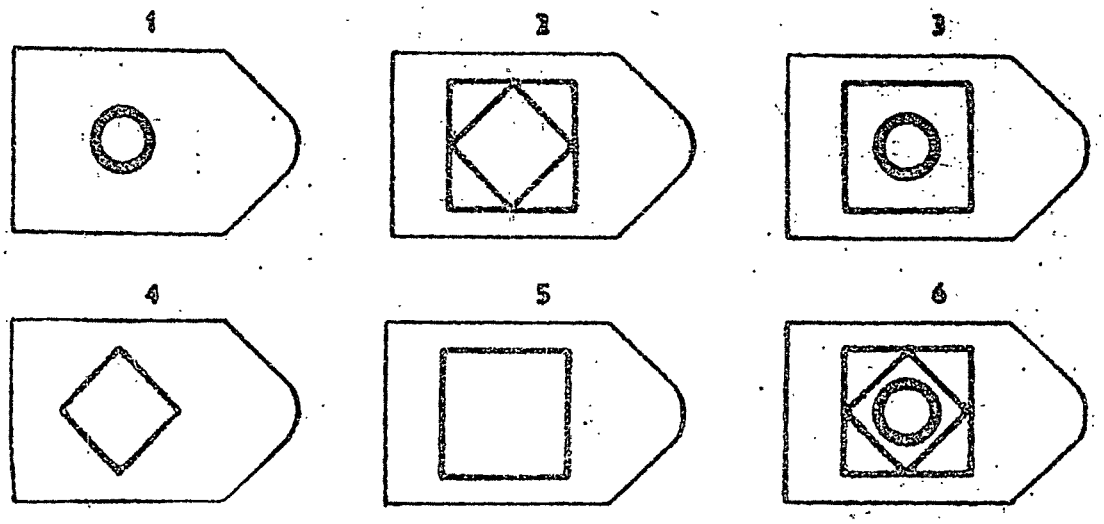
B 12





SET C

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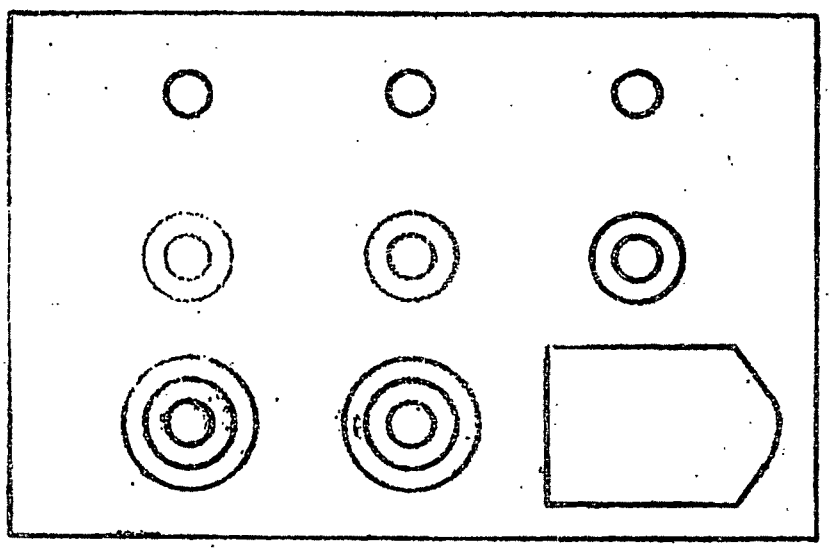

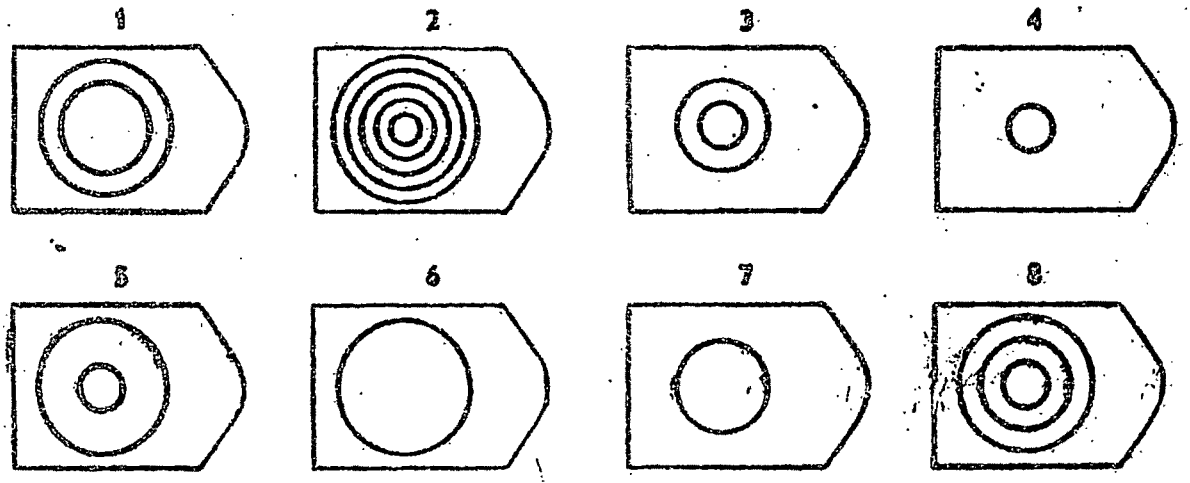

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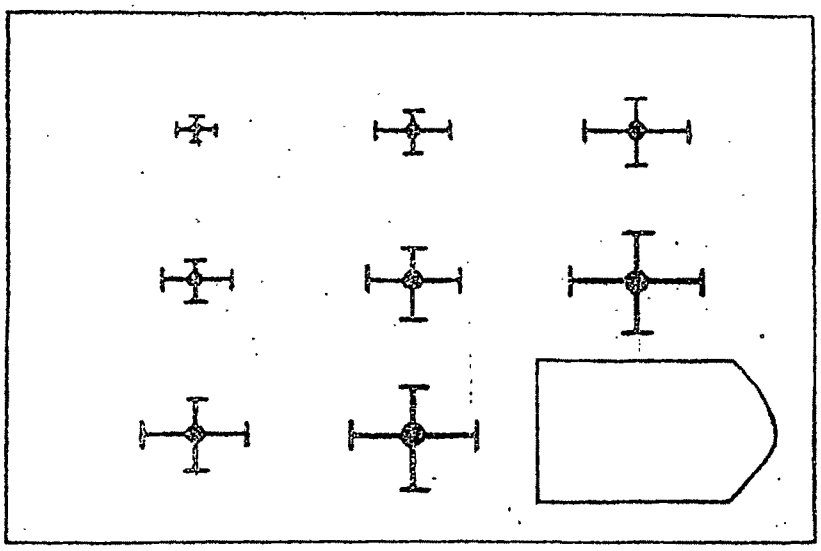

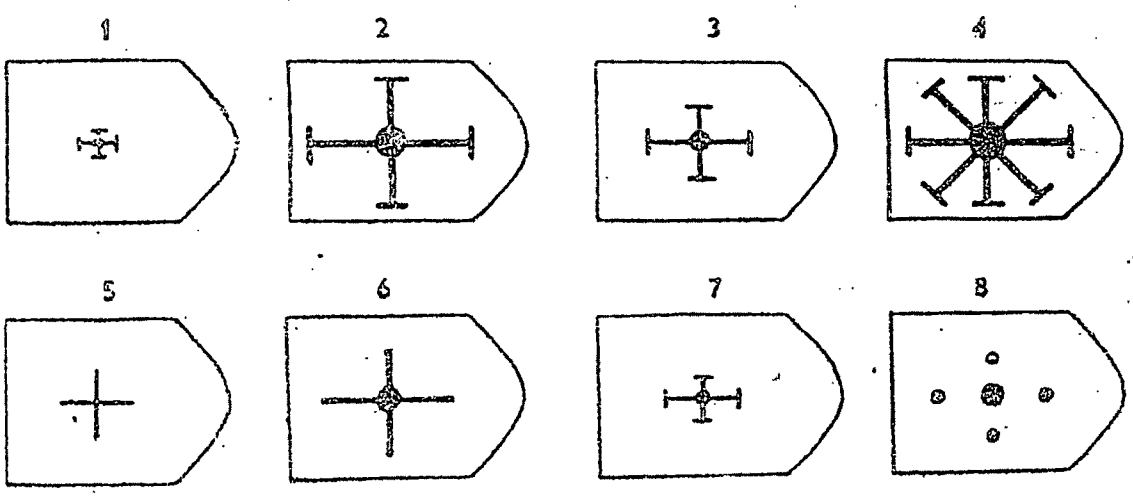

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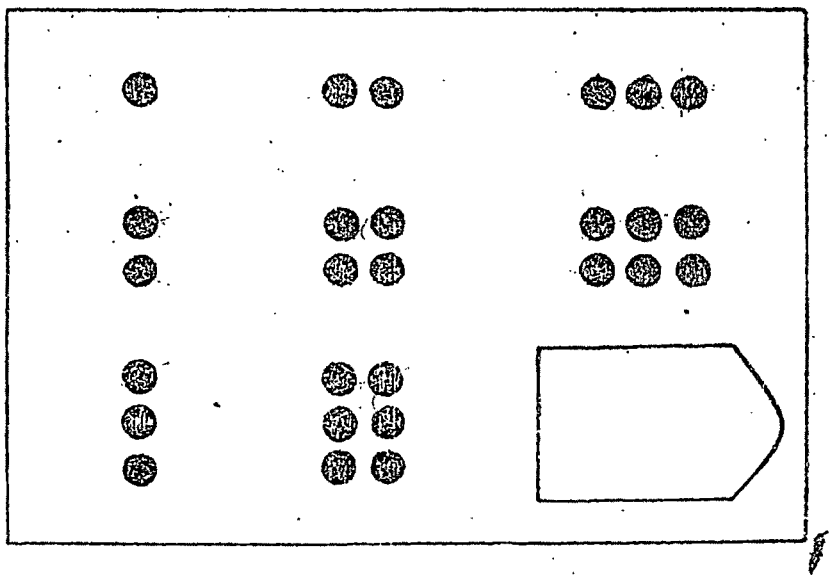

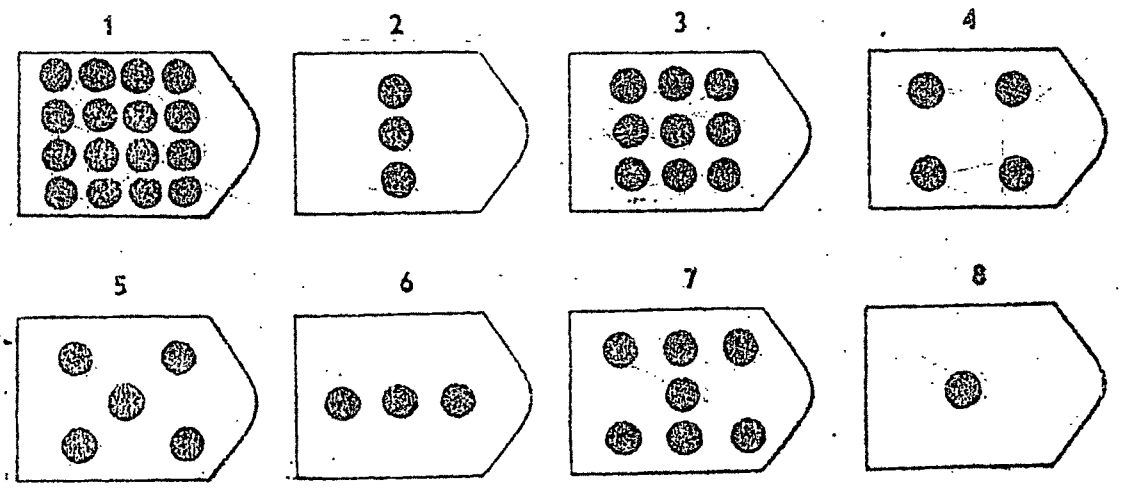

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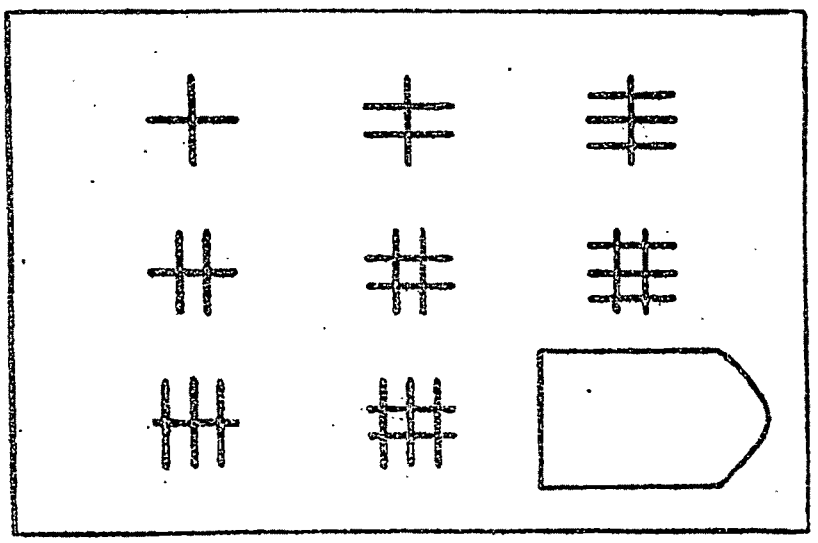

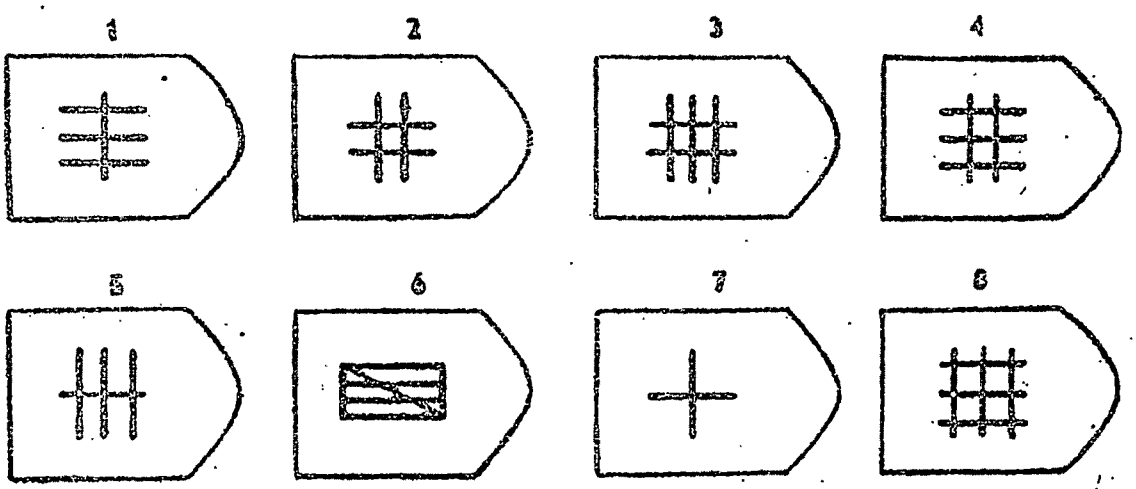

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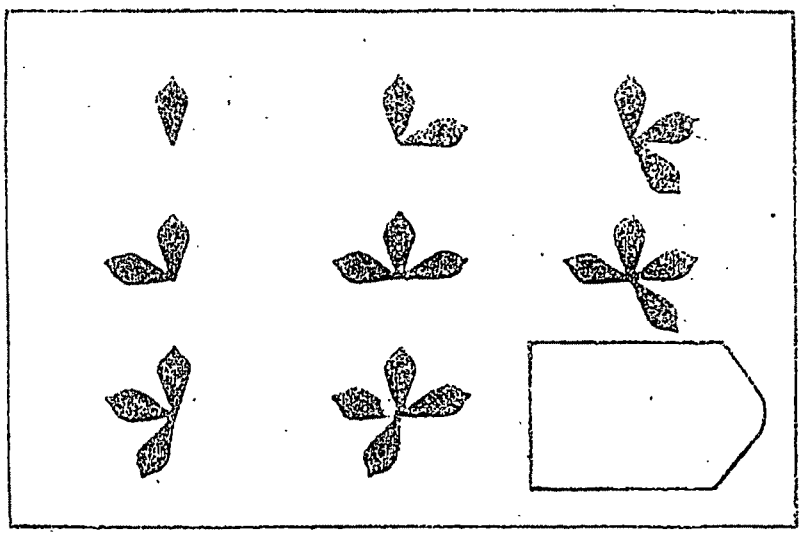

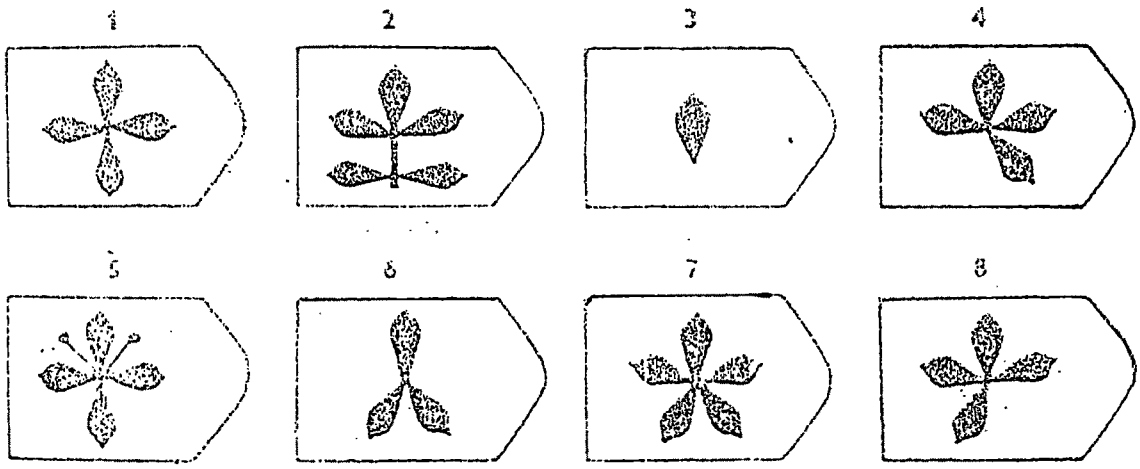

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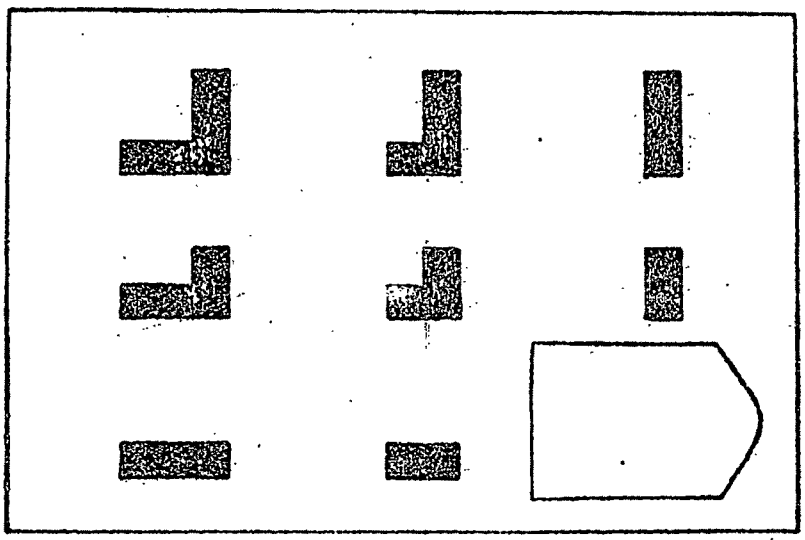

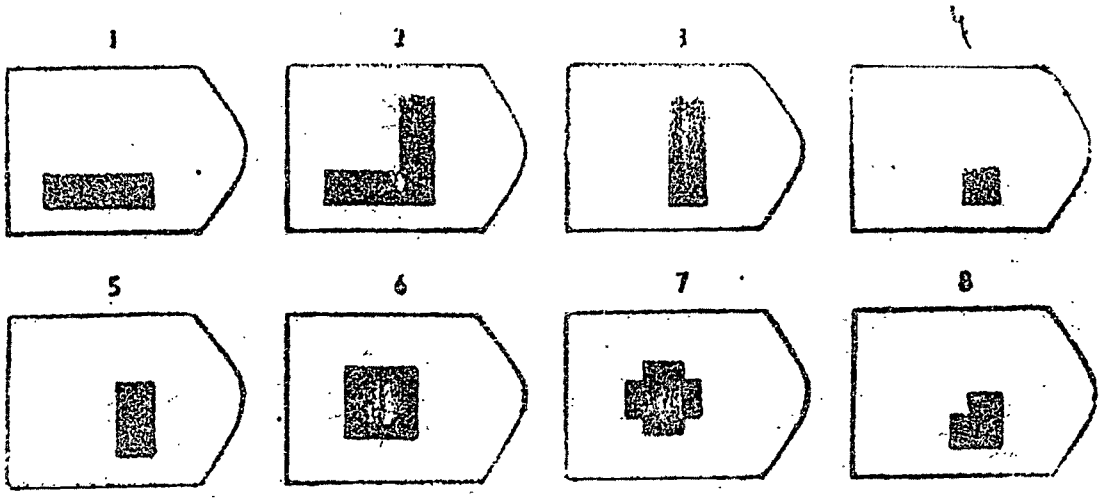

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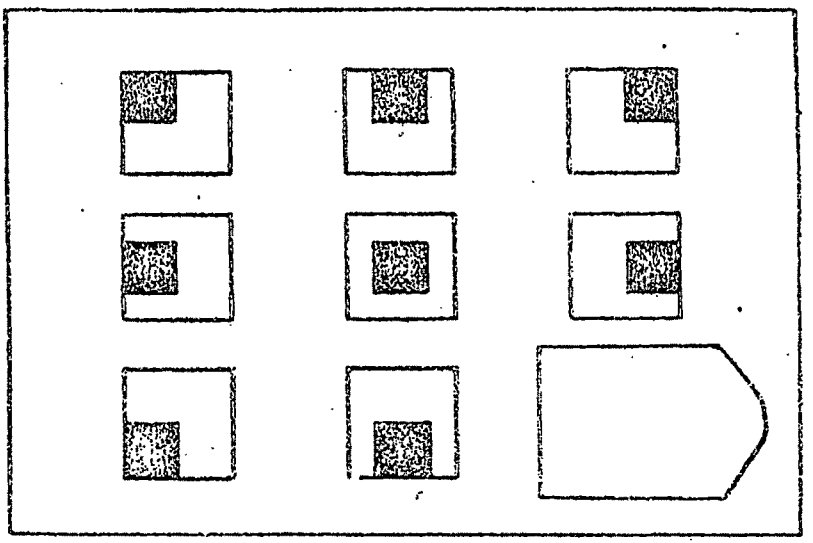

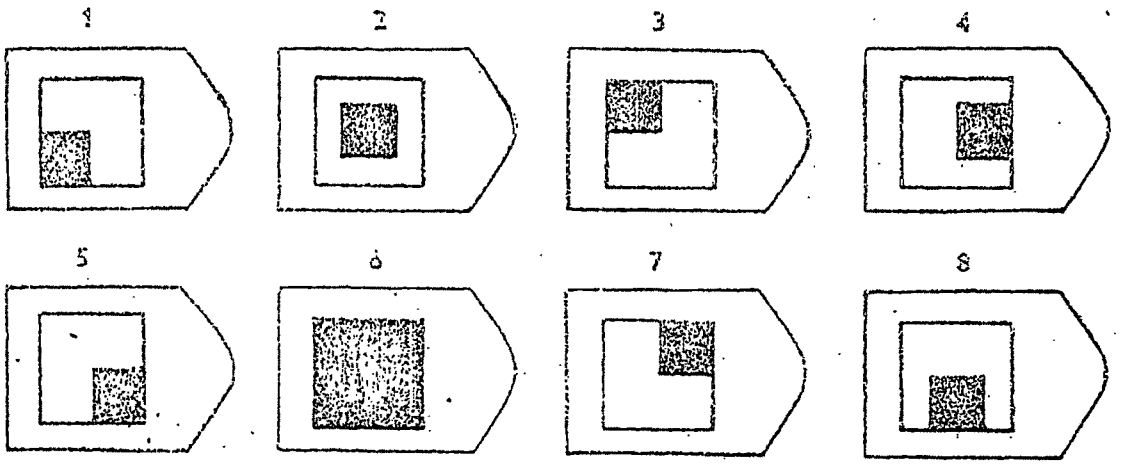

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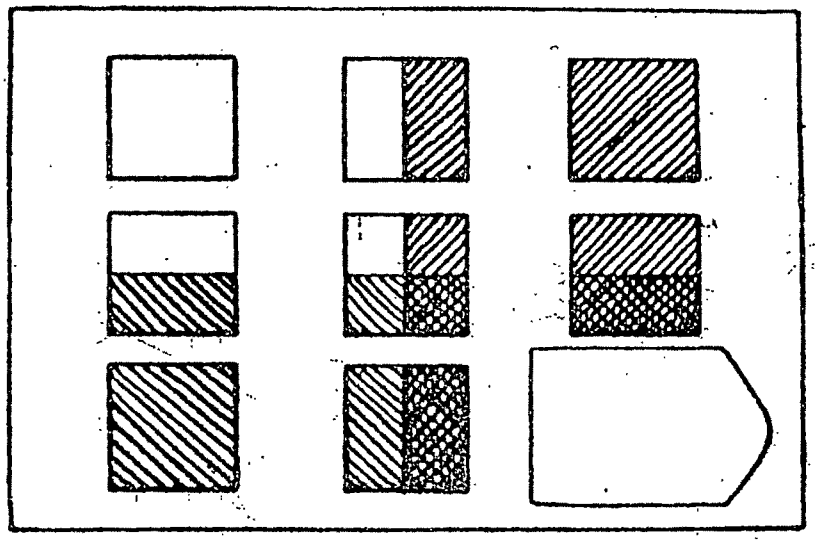

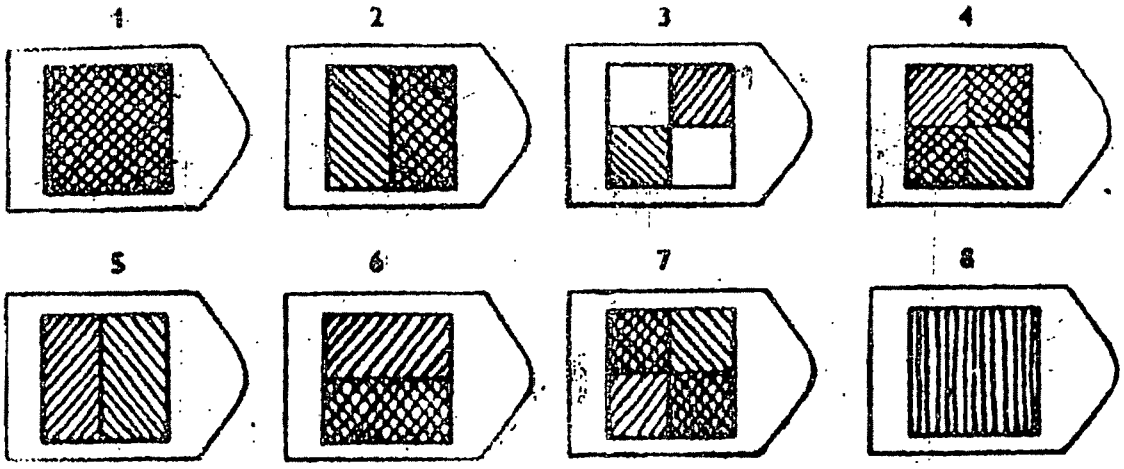

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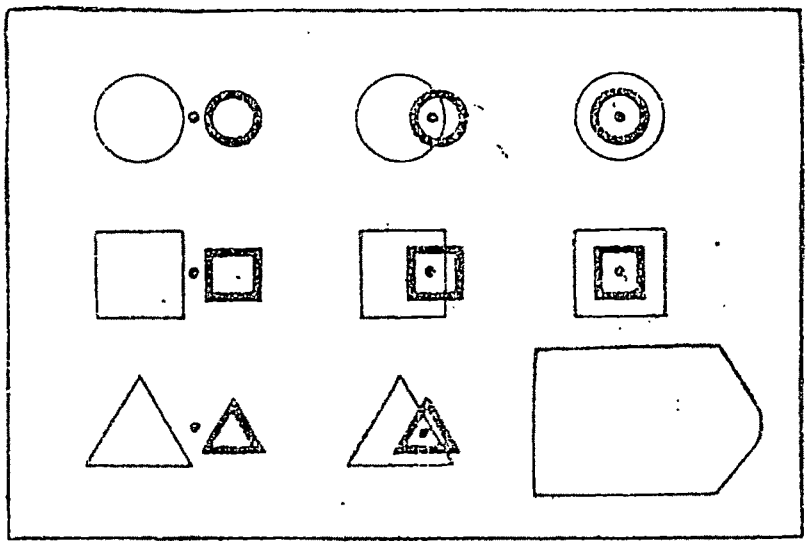

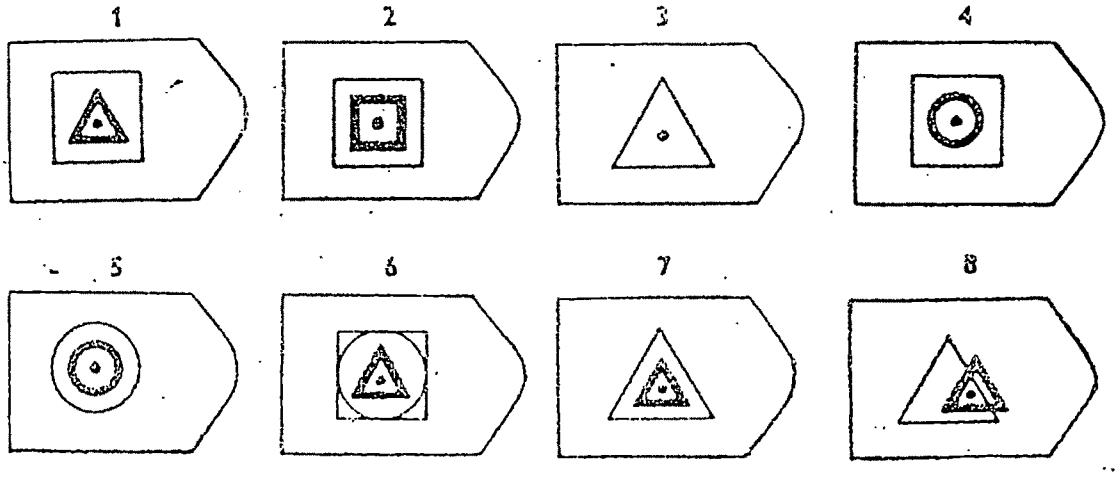

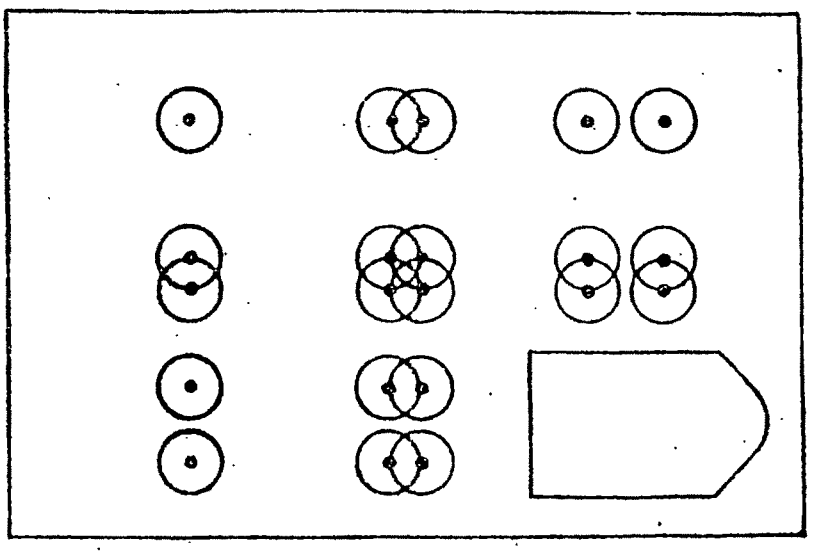

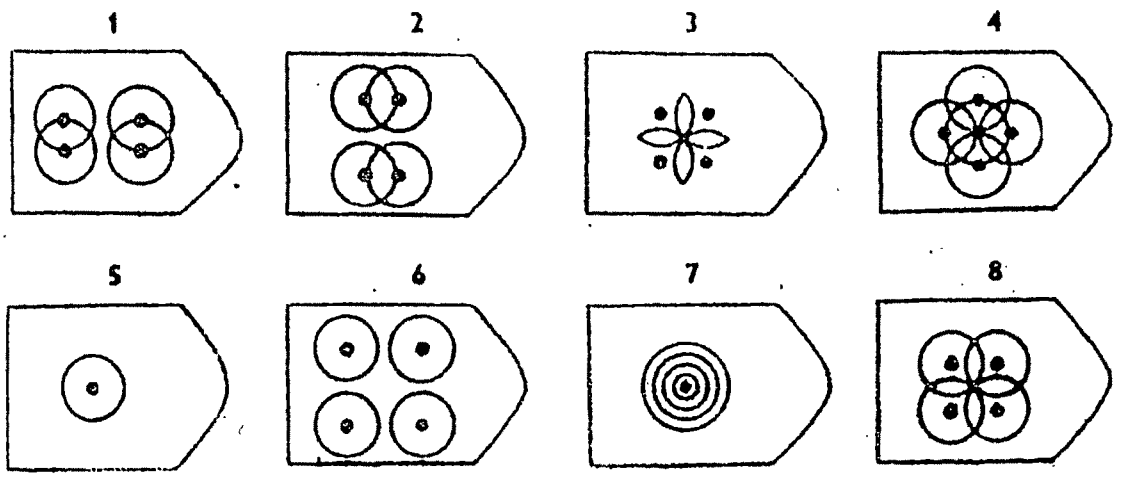
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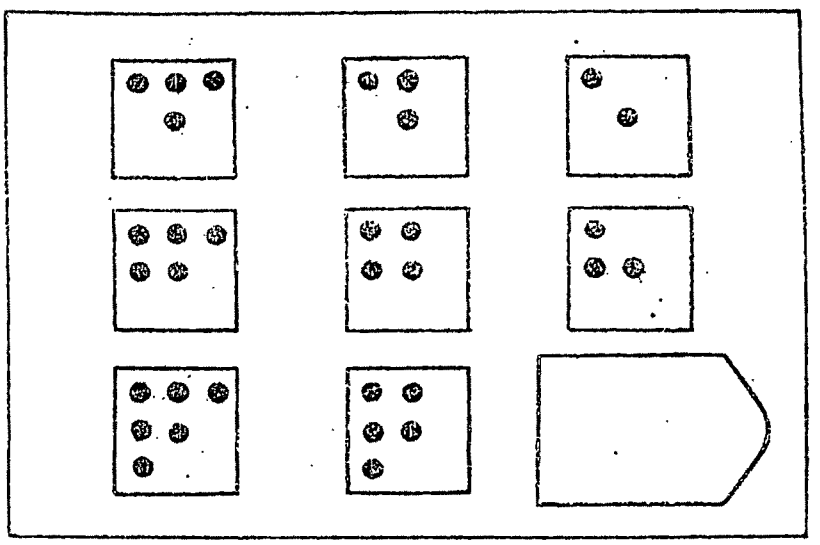

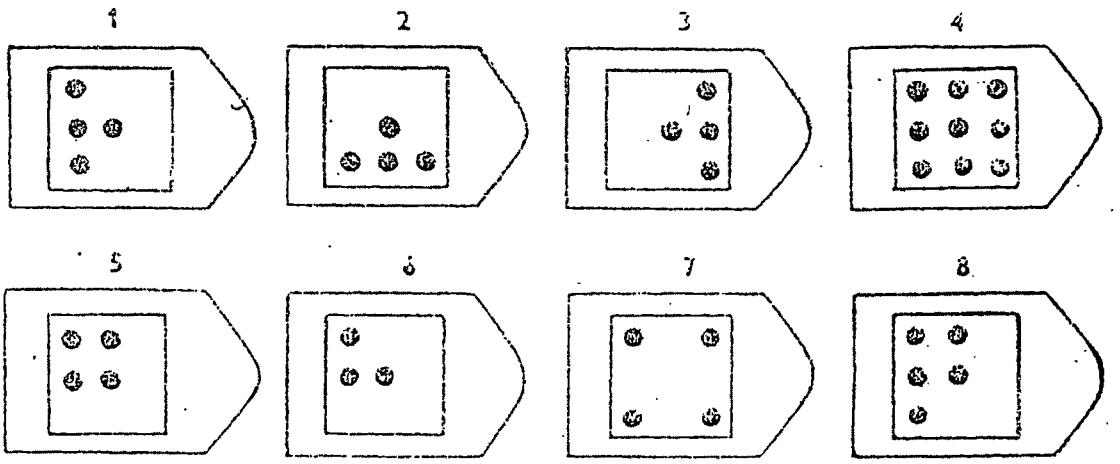
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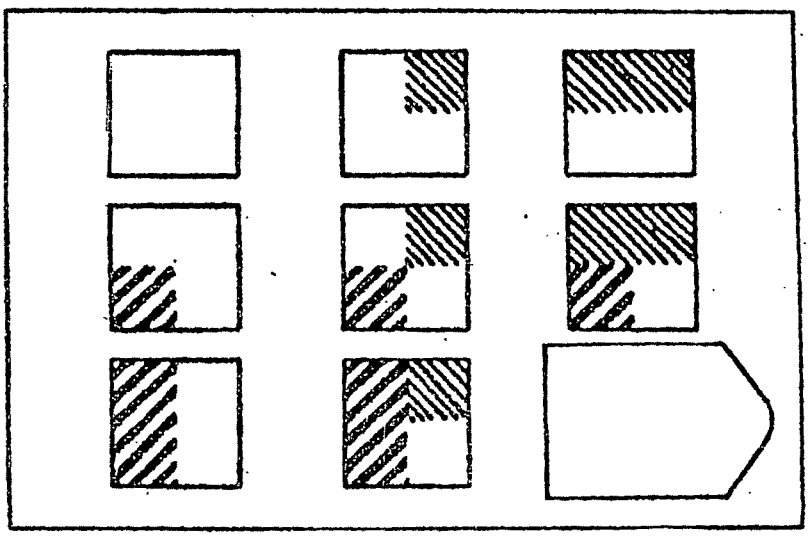

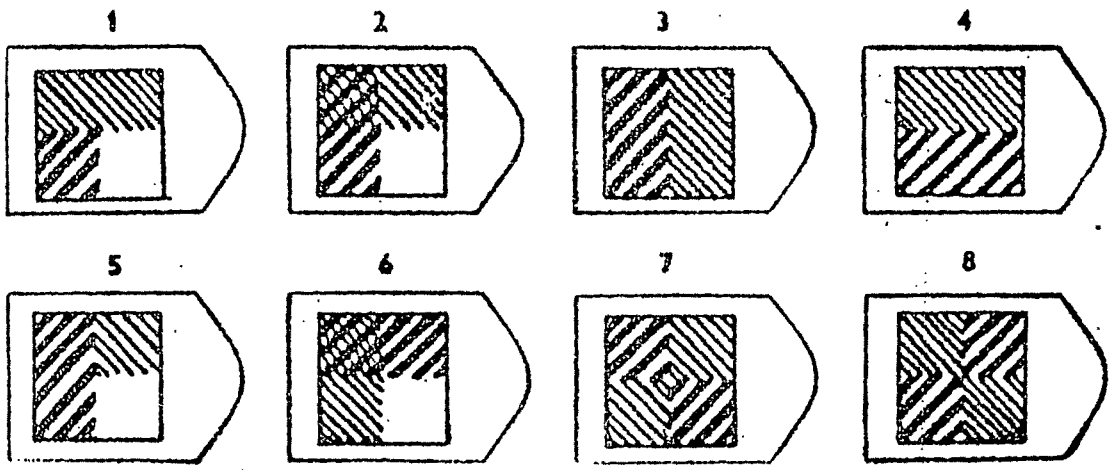

SET D

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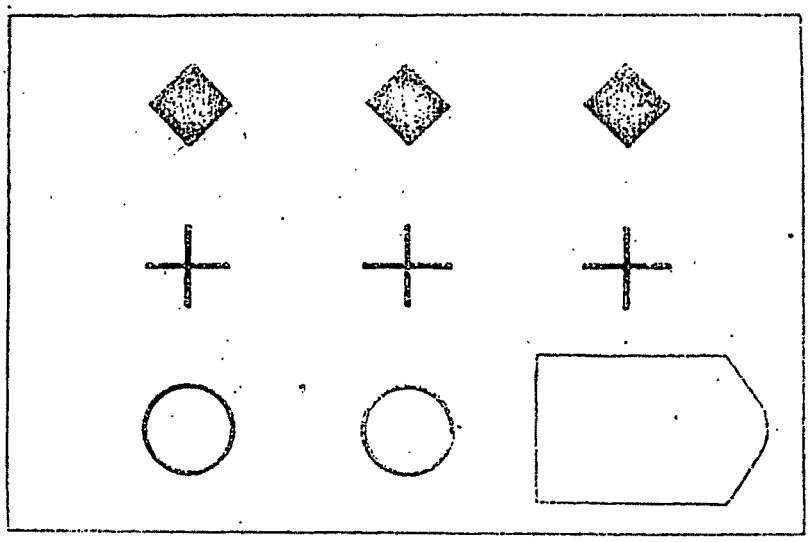

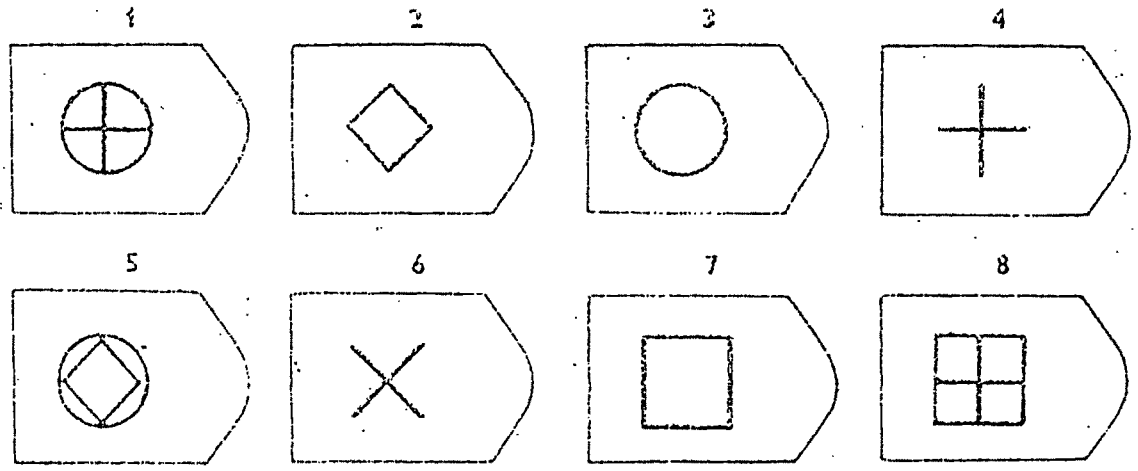

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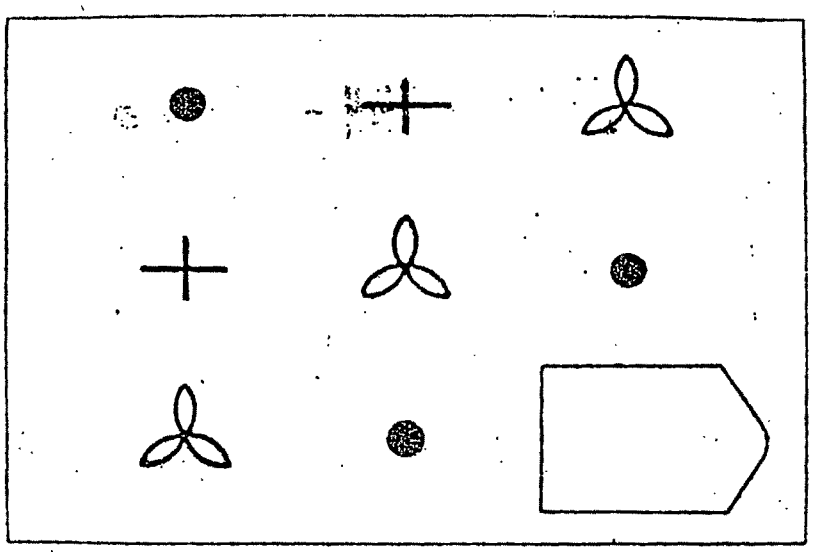

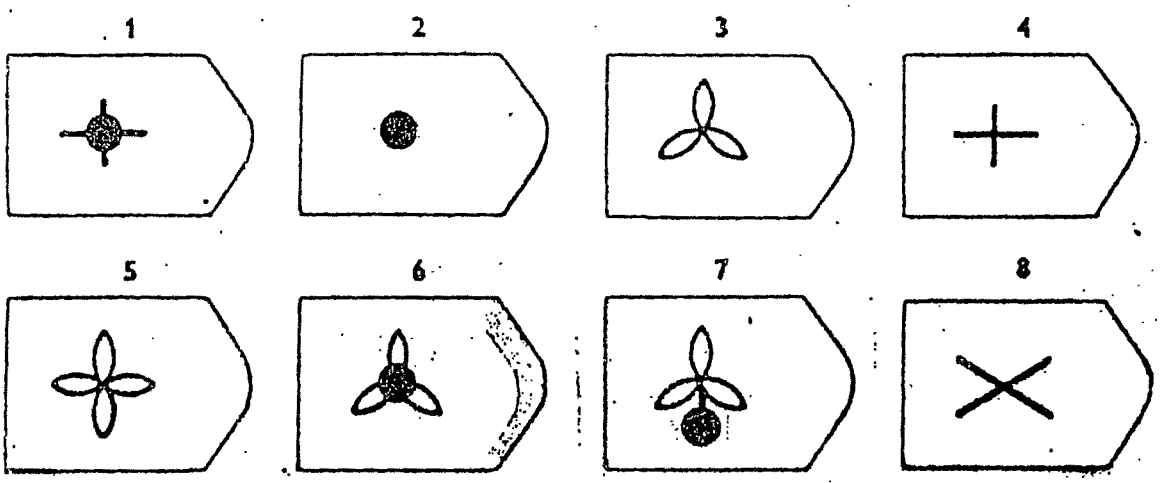

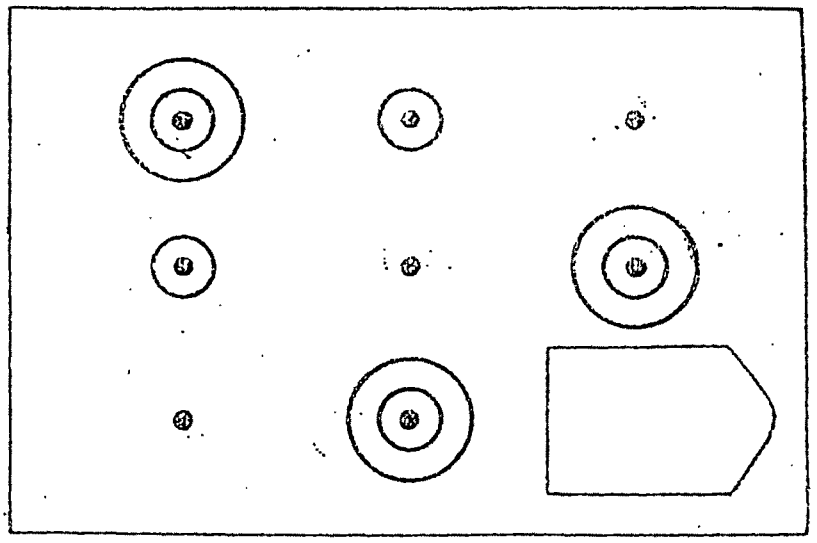

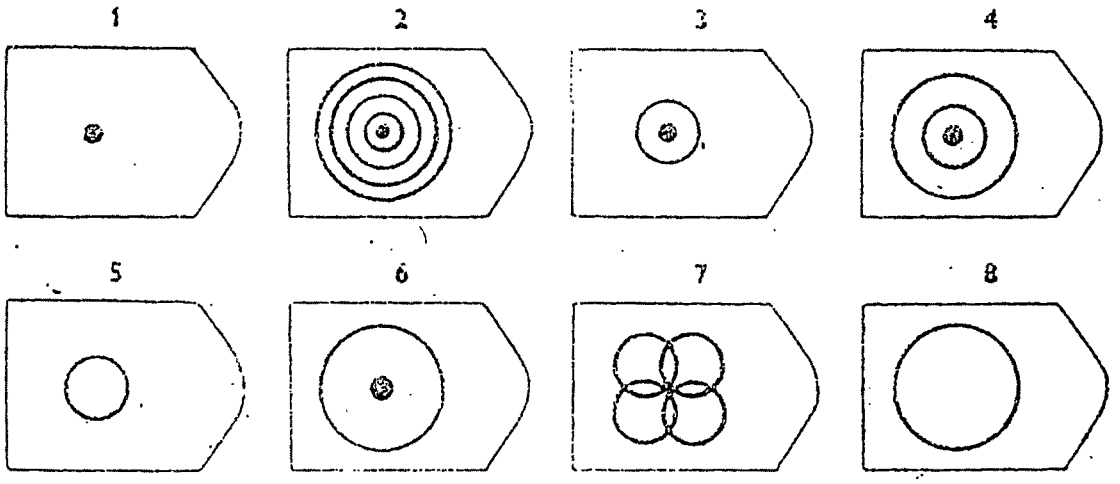
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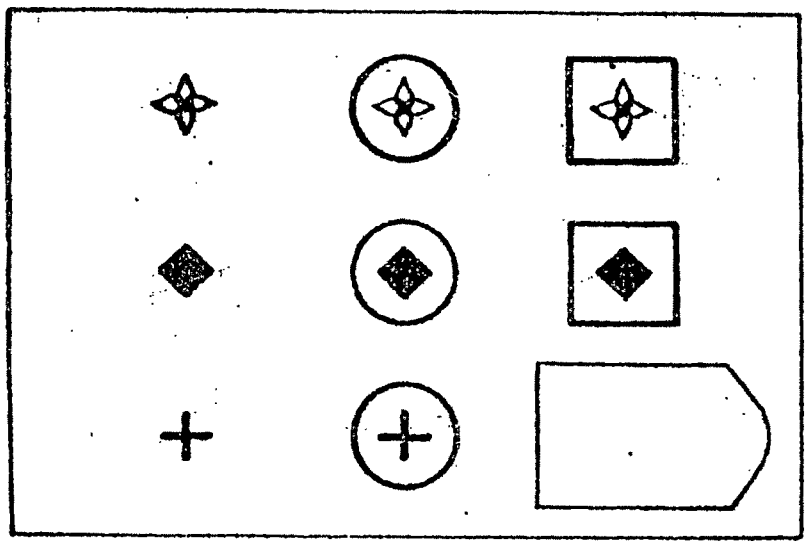

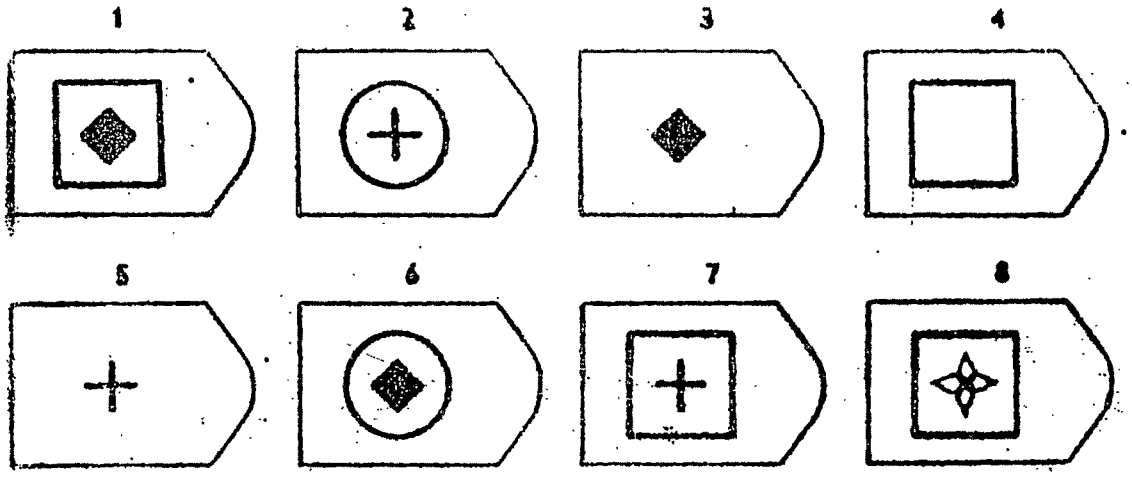

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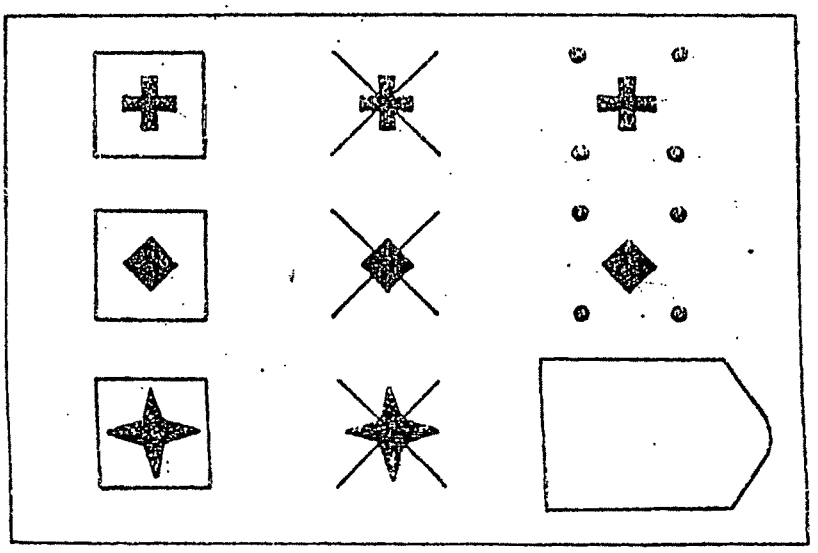

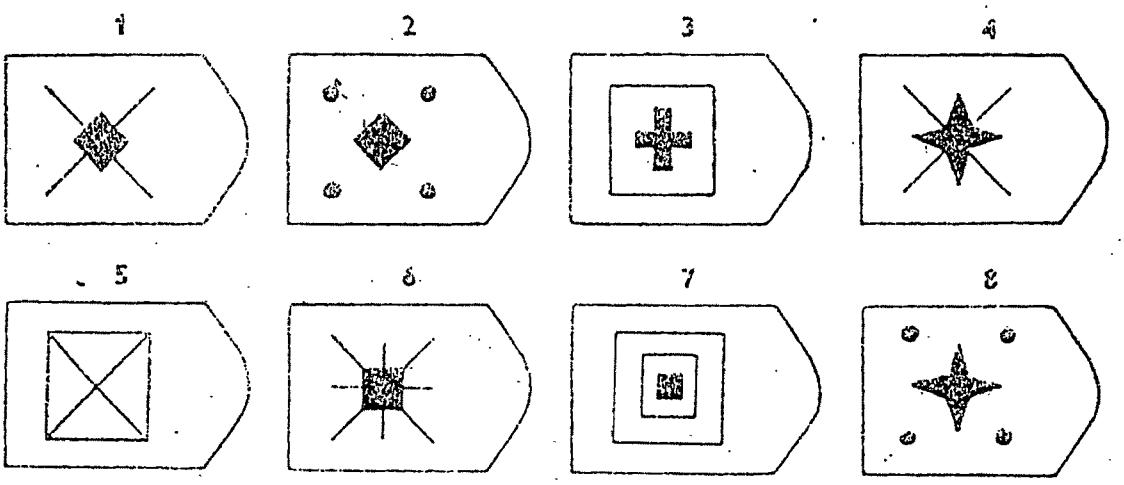

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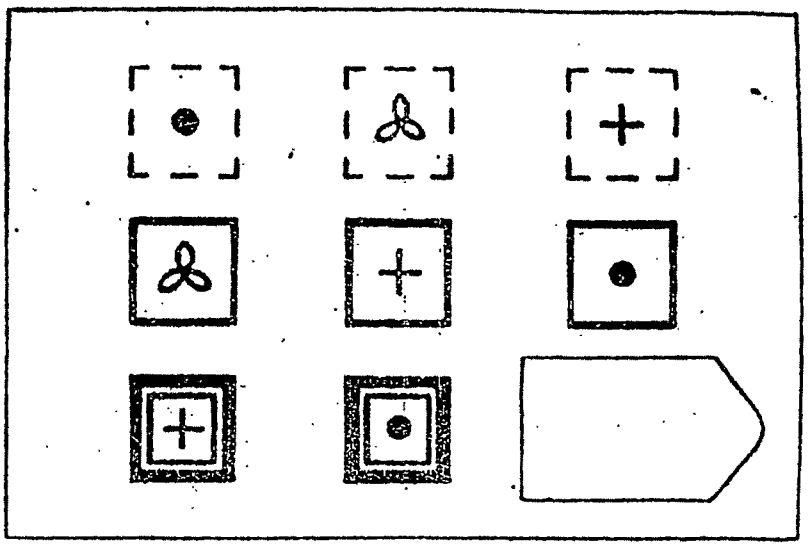

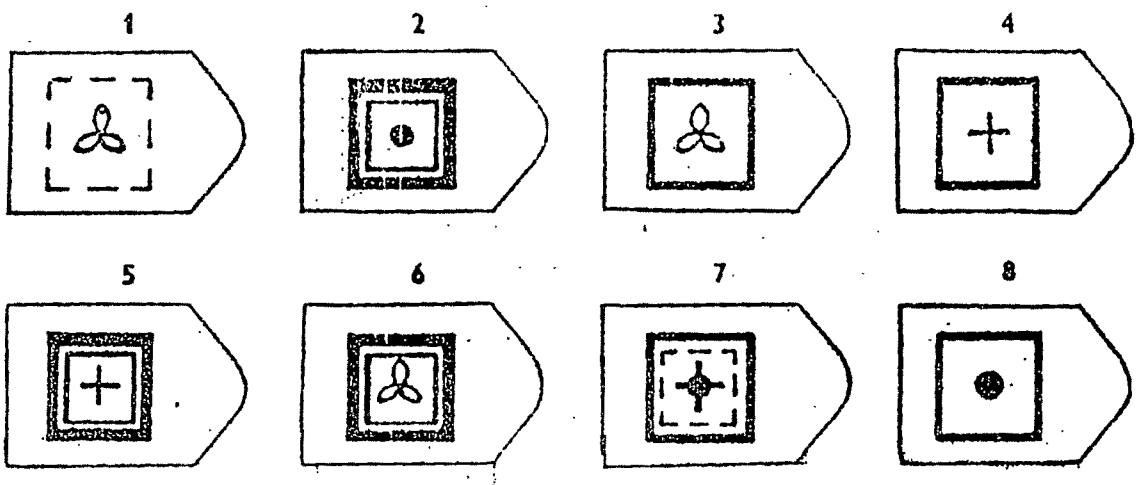

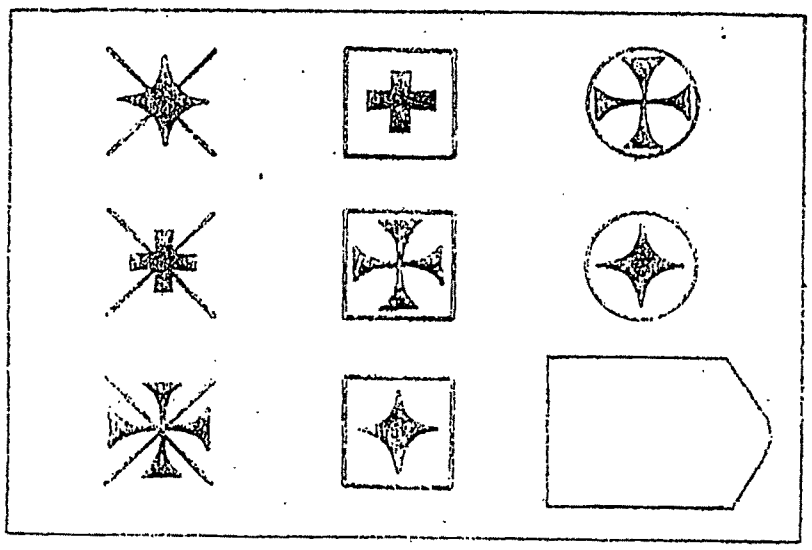

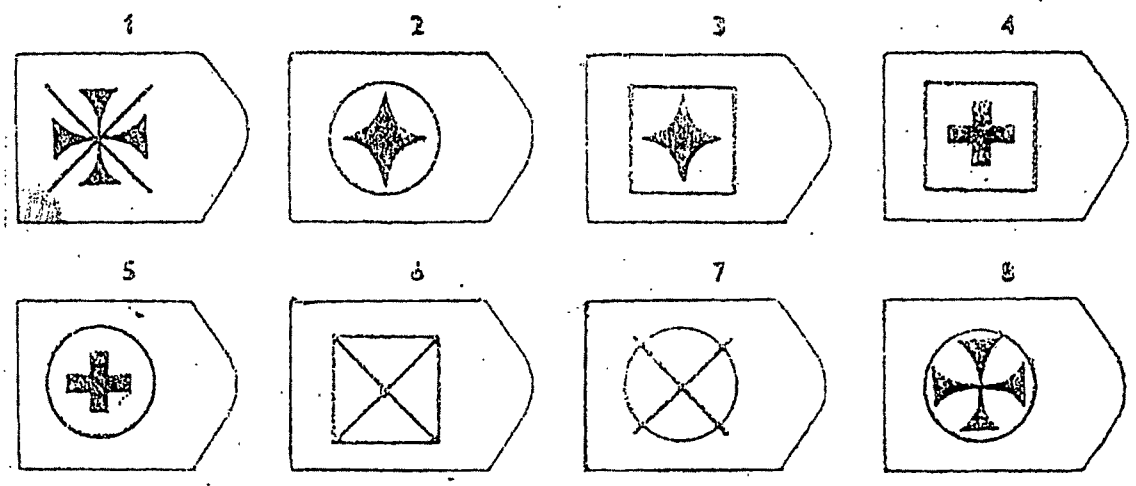
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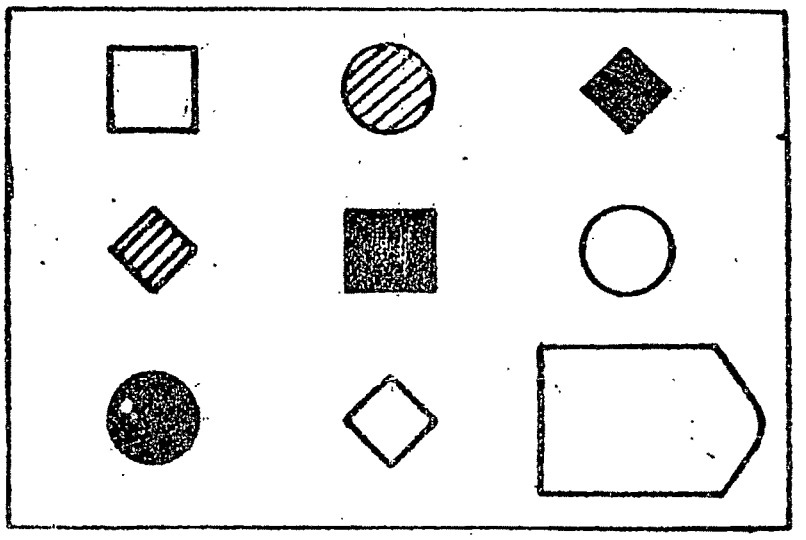
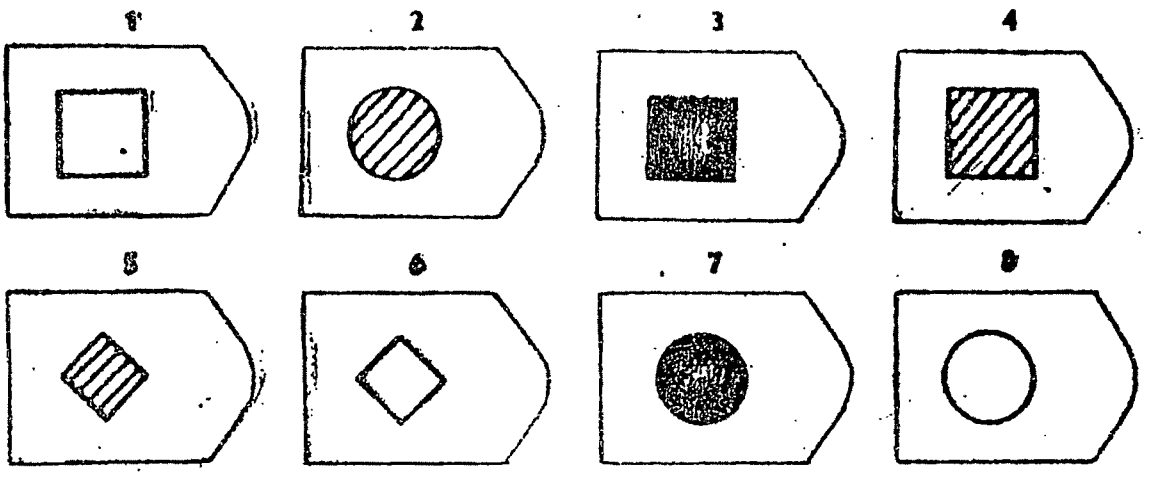
D 8





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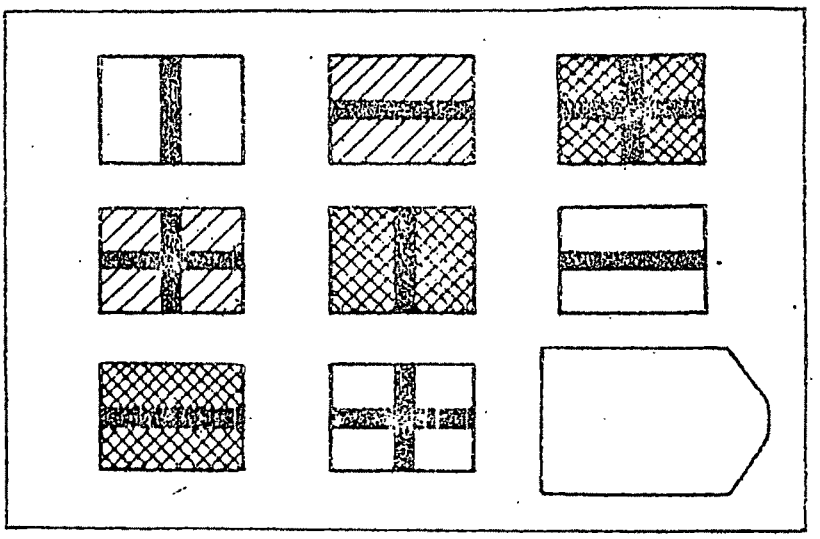

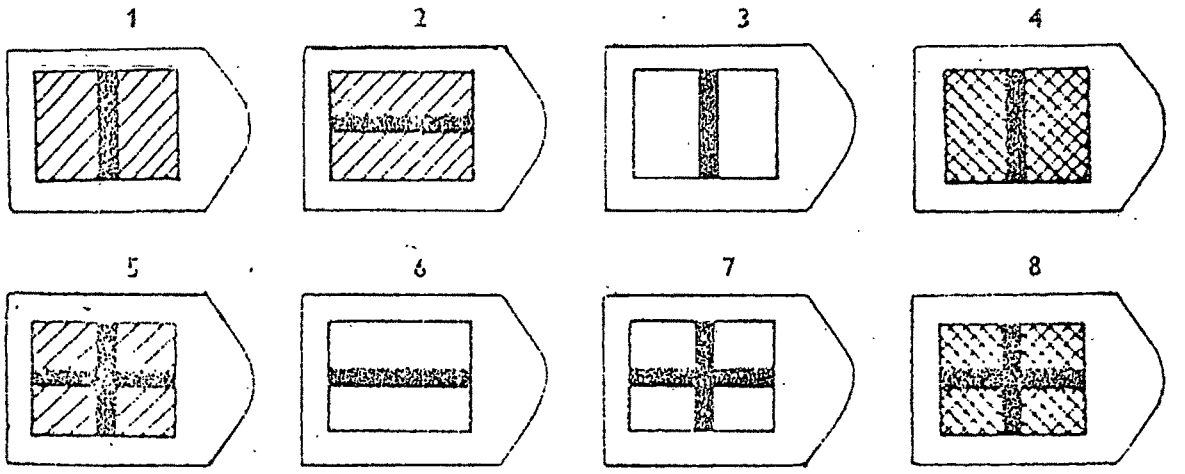

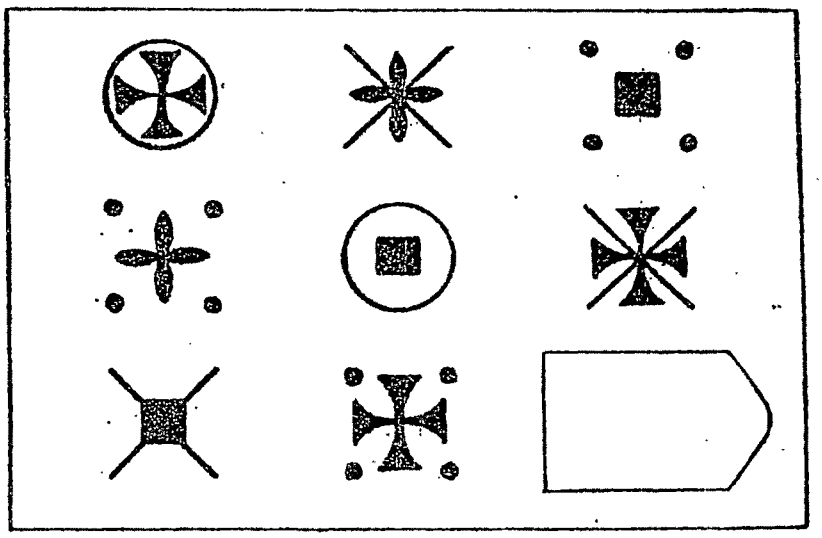

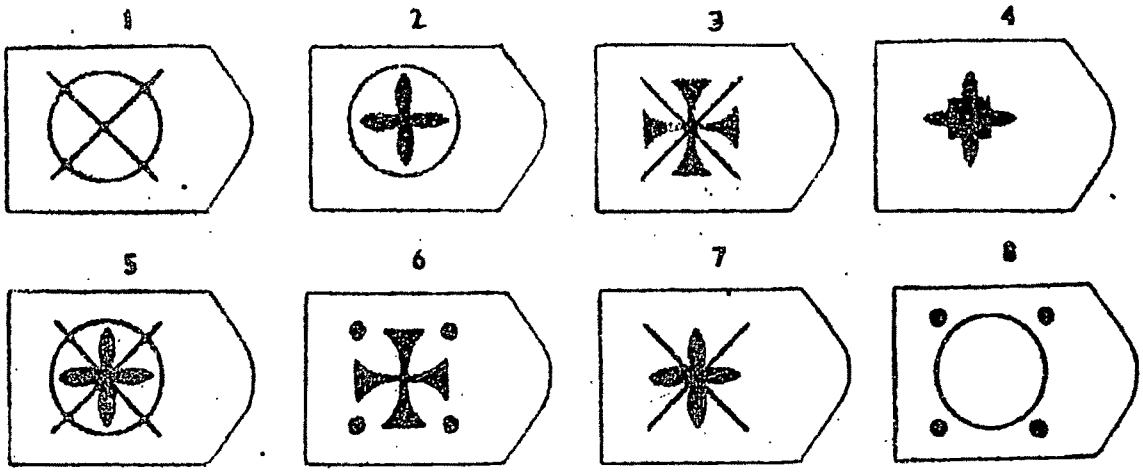
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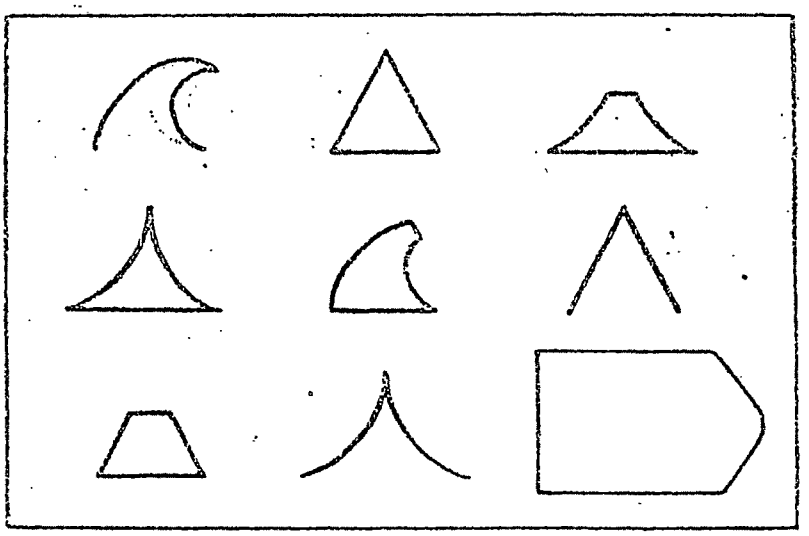

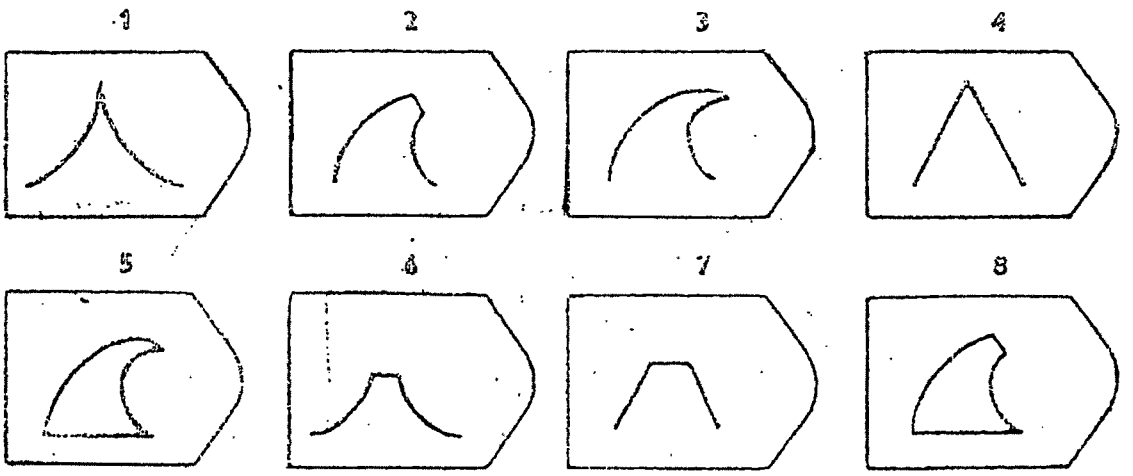
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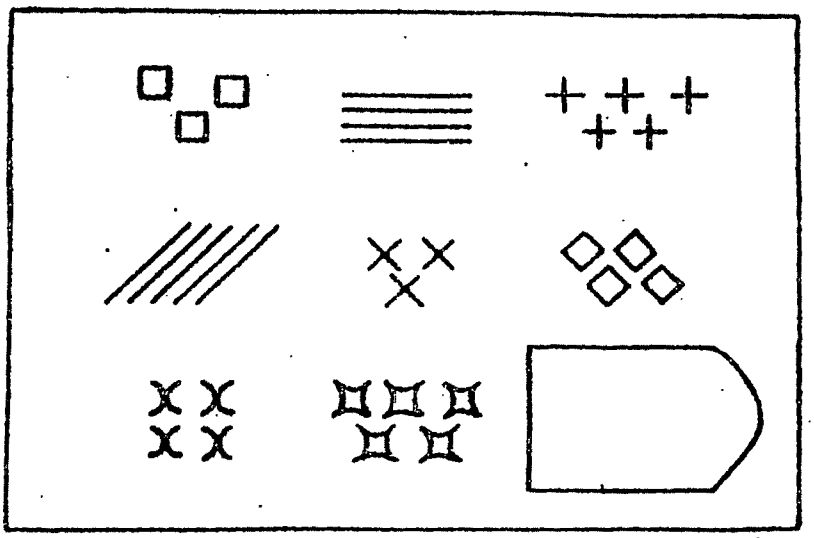
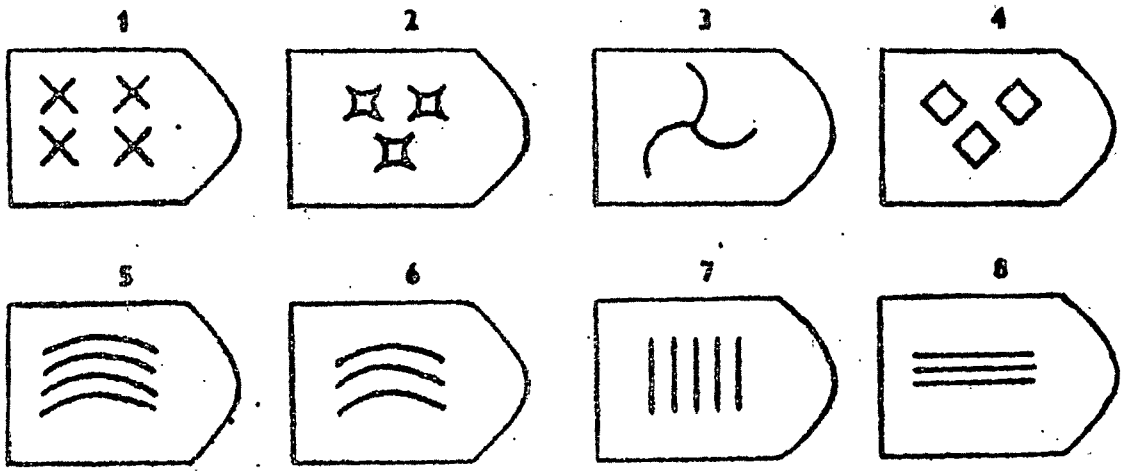
D 12





SET E

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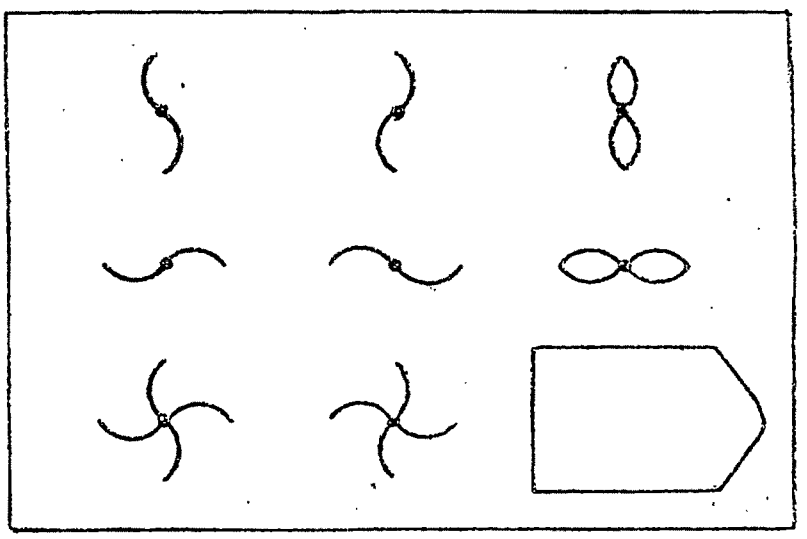

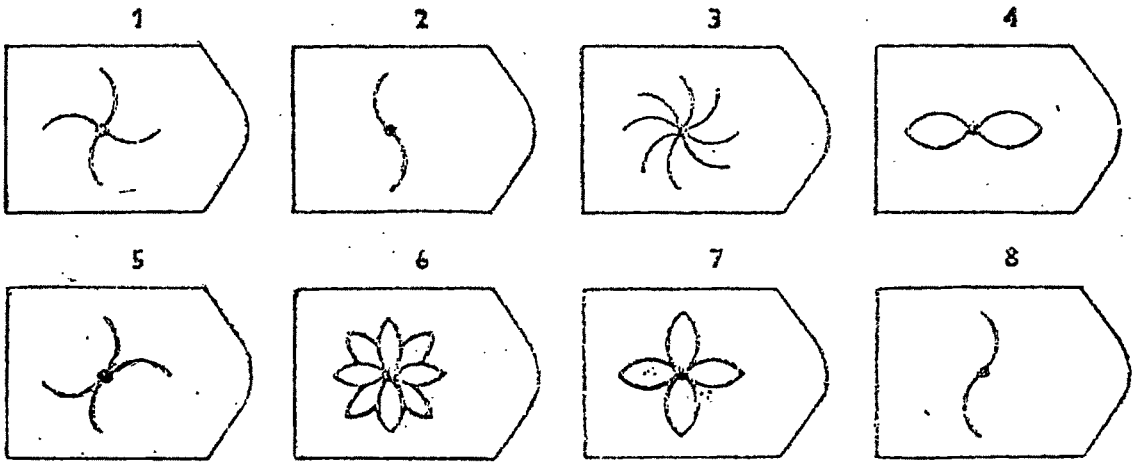

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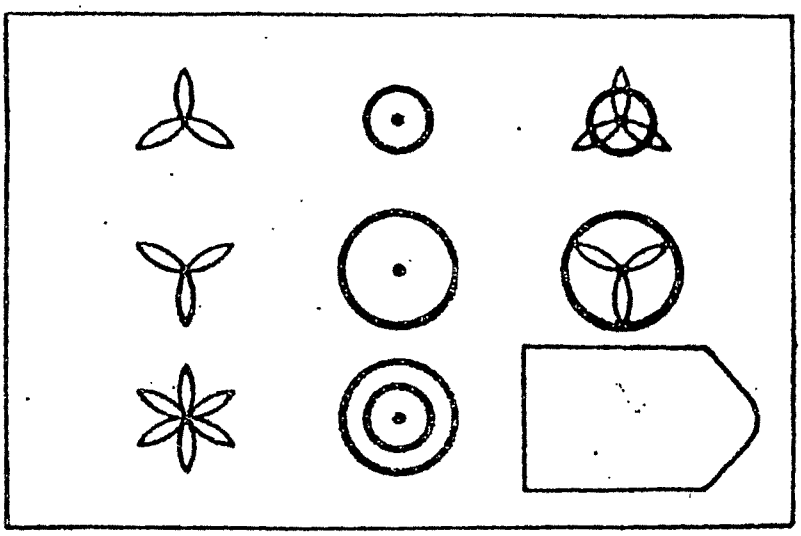

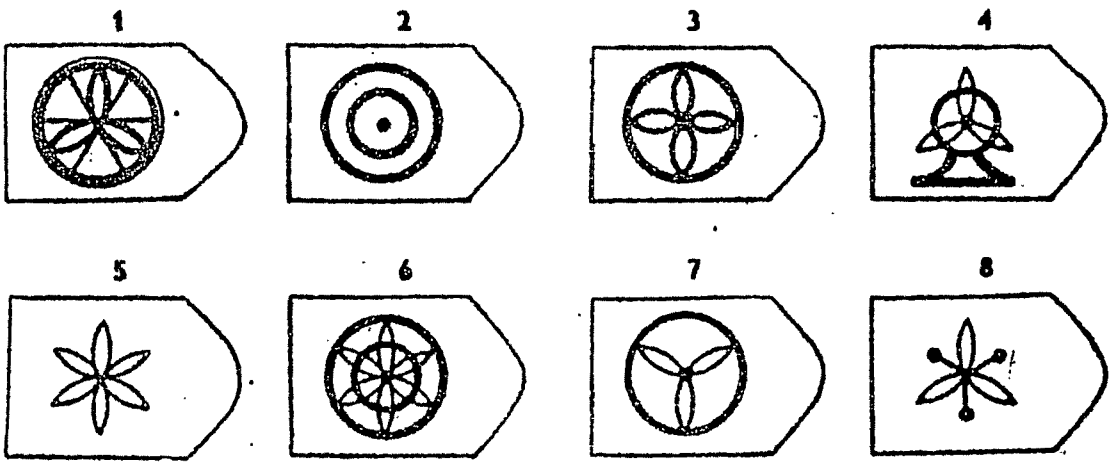

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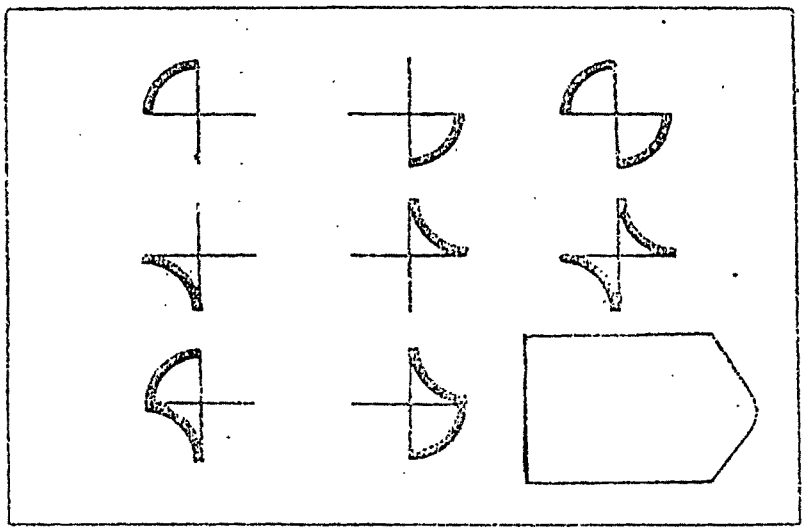

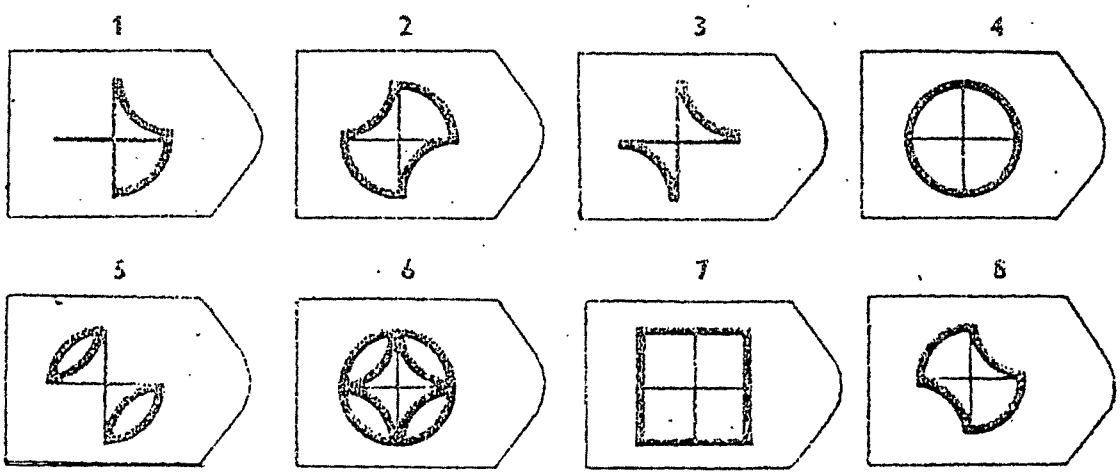

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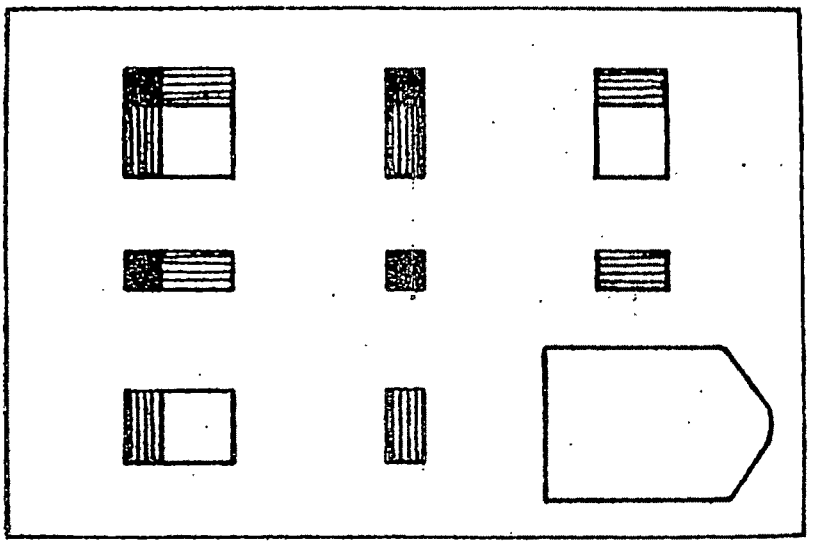

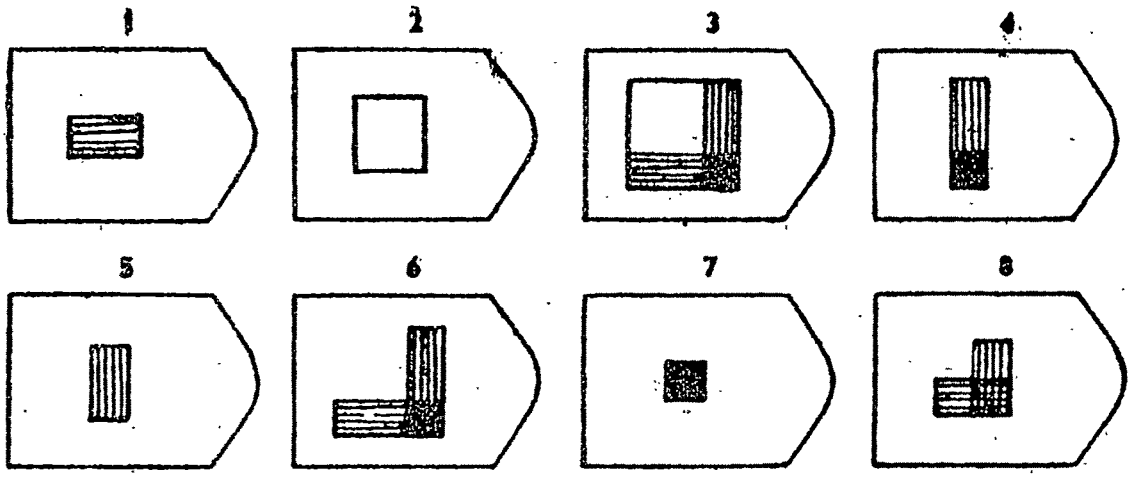

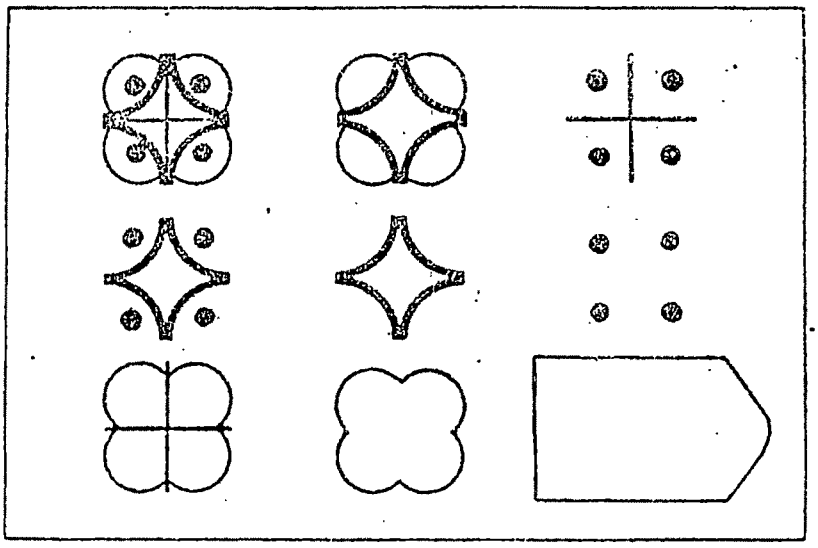

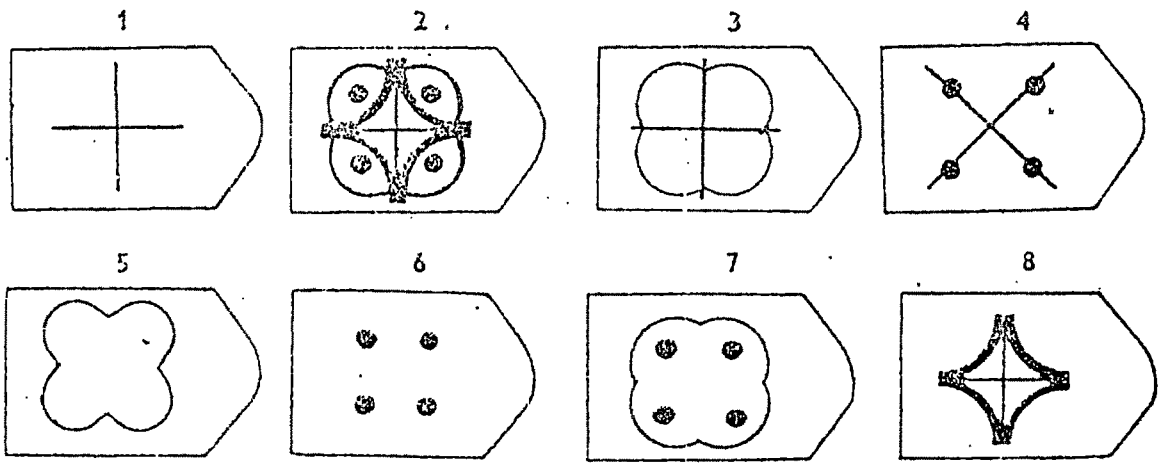
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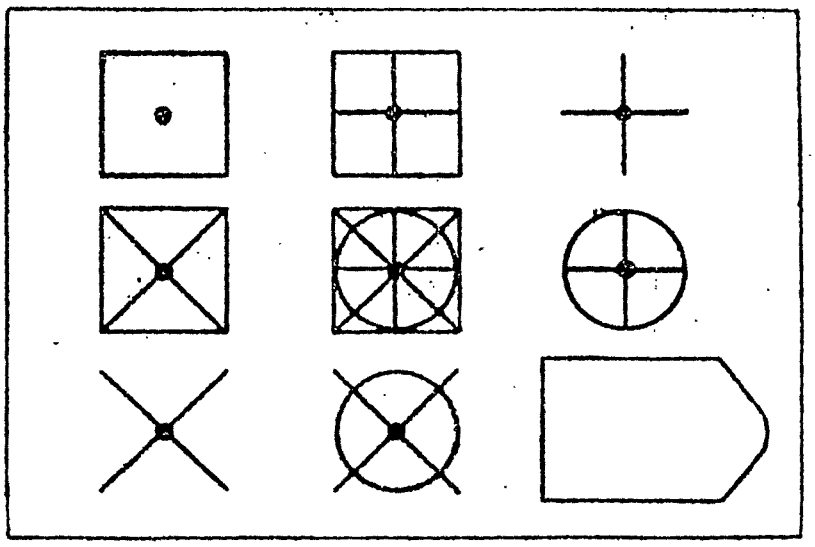
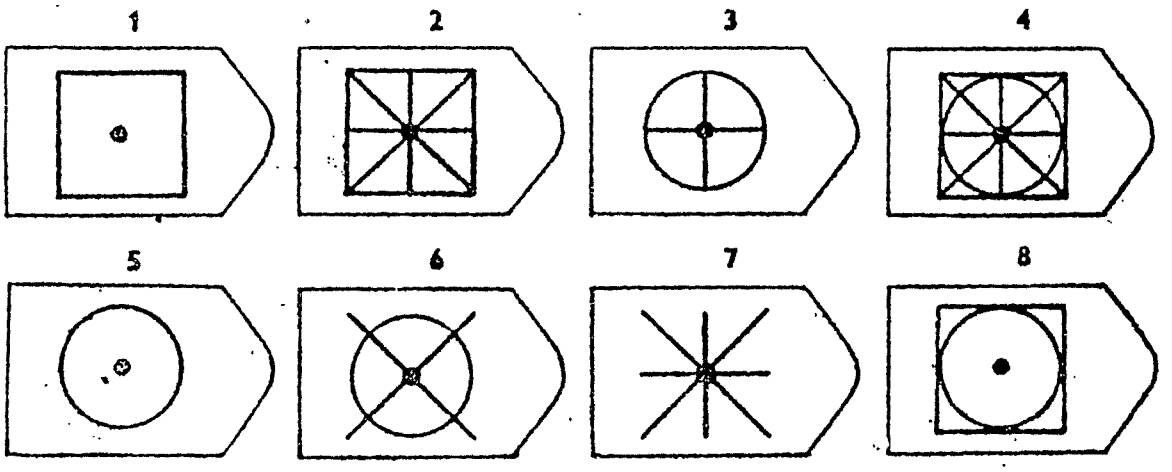
E6





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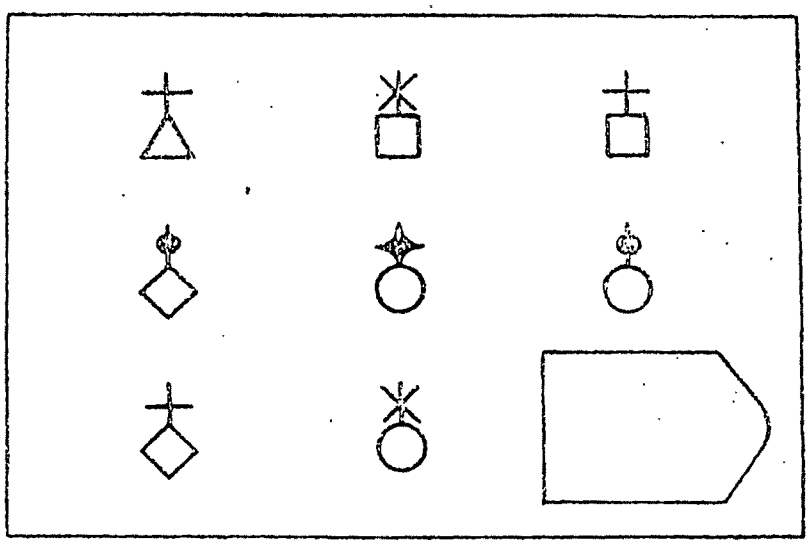

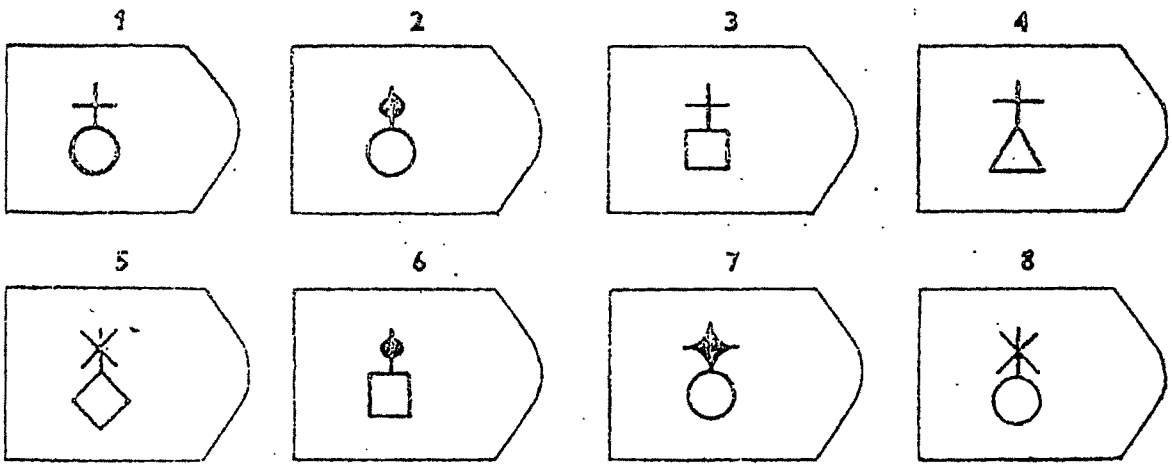

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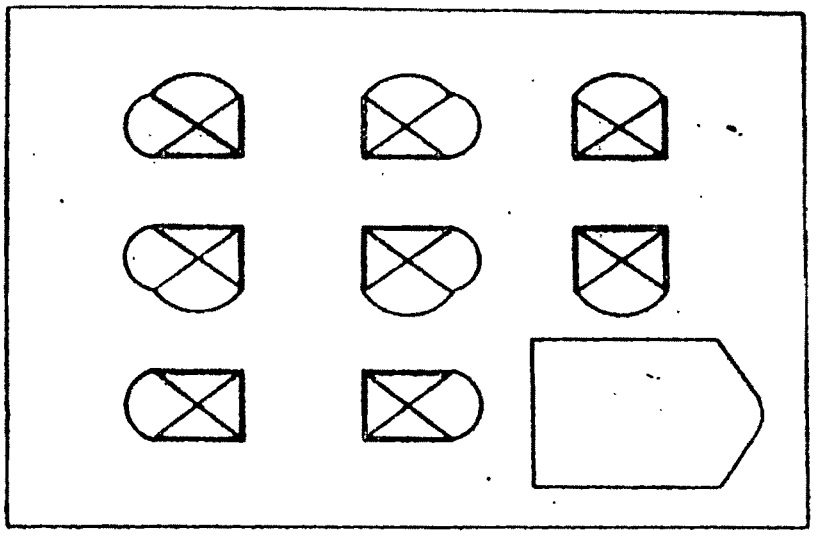
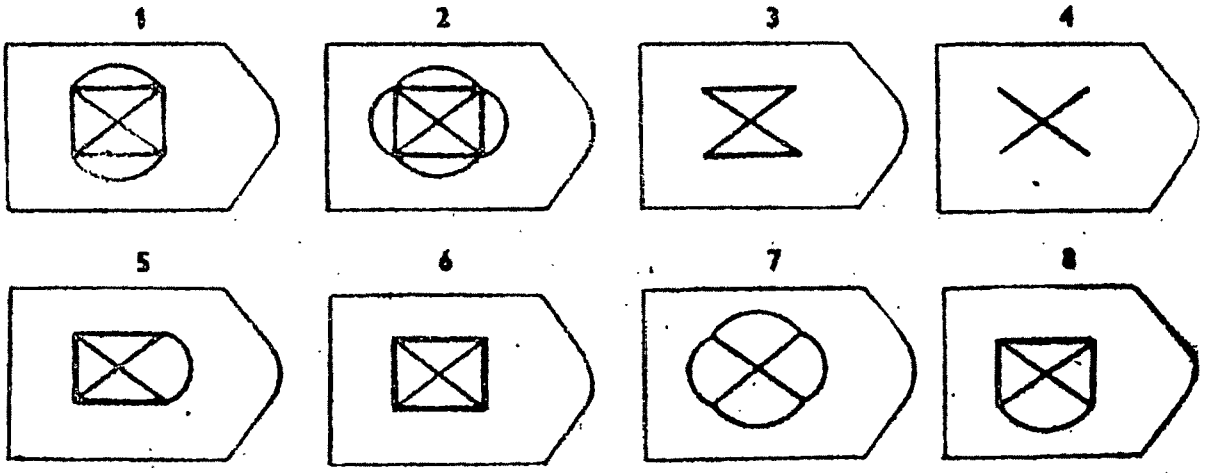
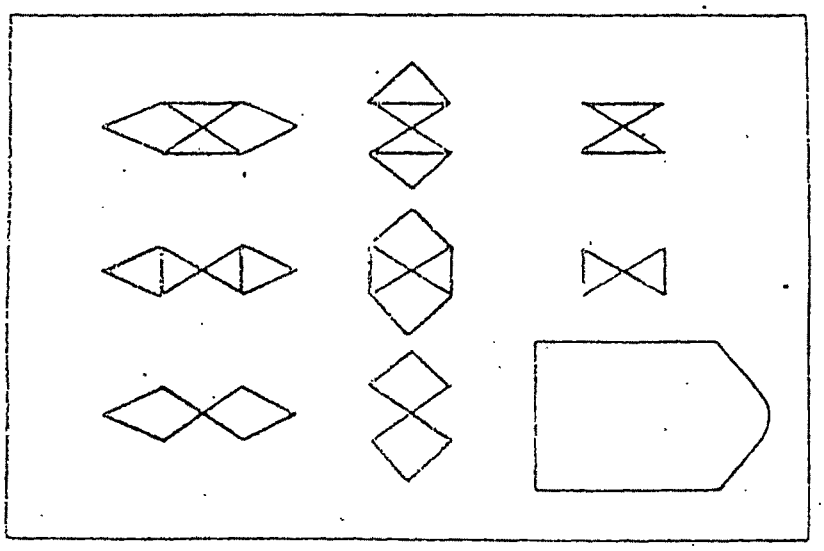
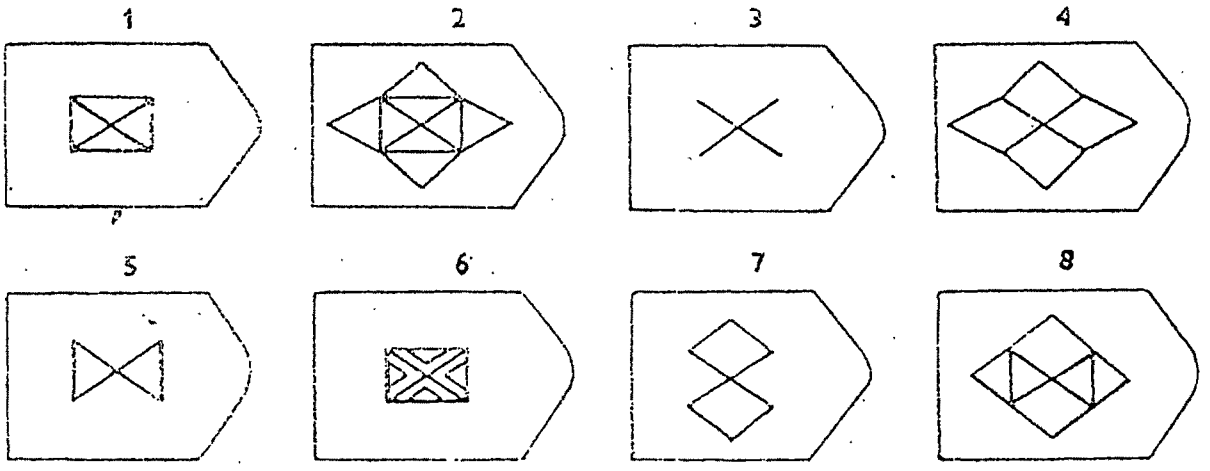
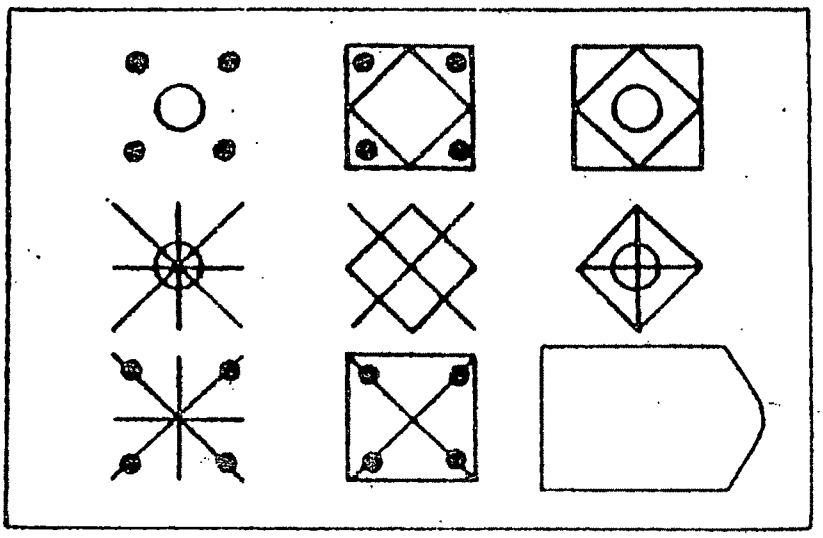


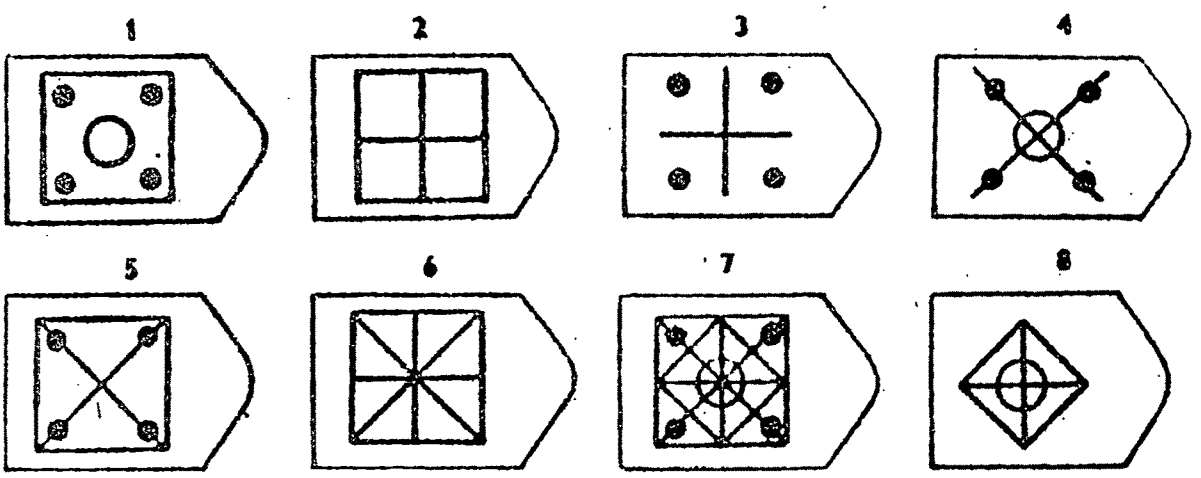


E 9





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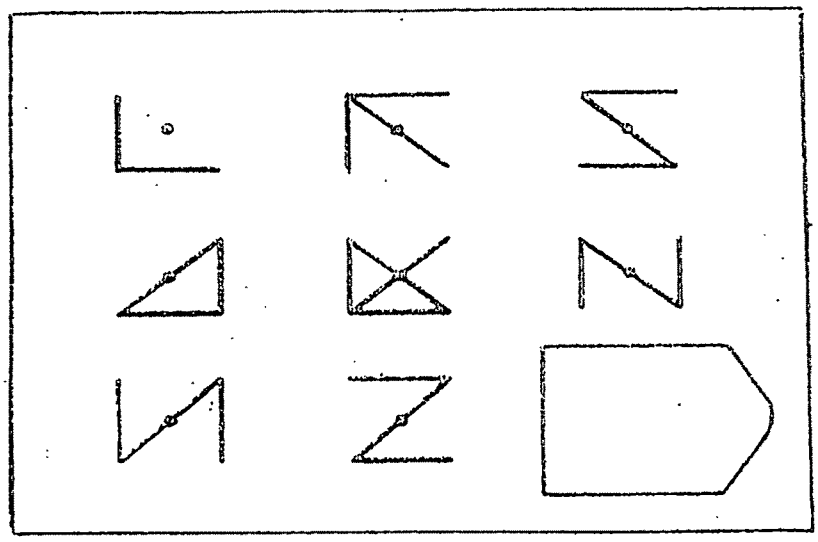
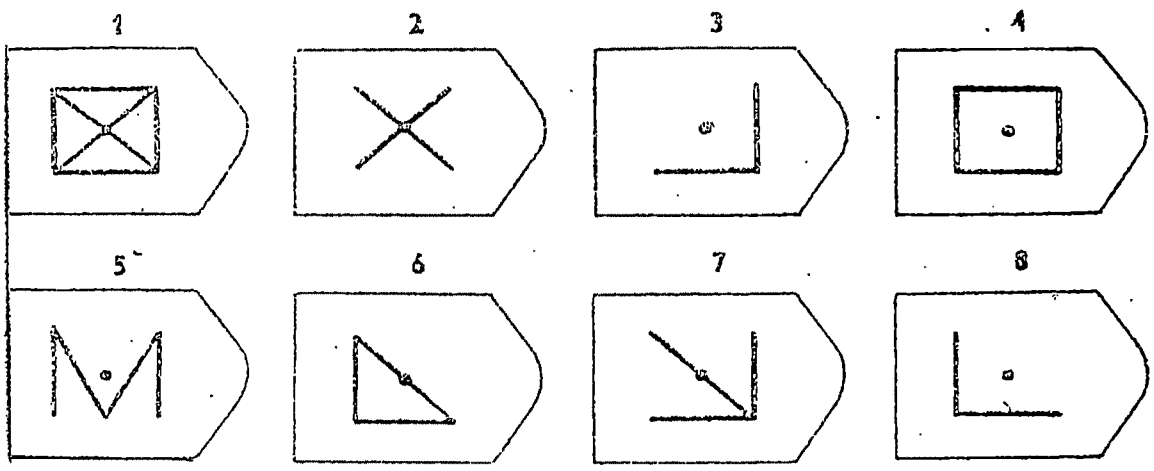
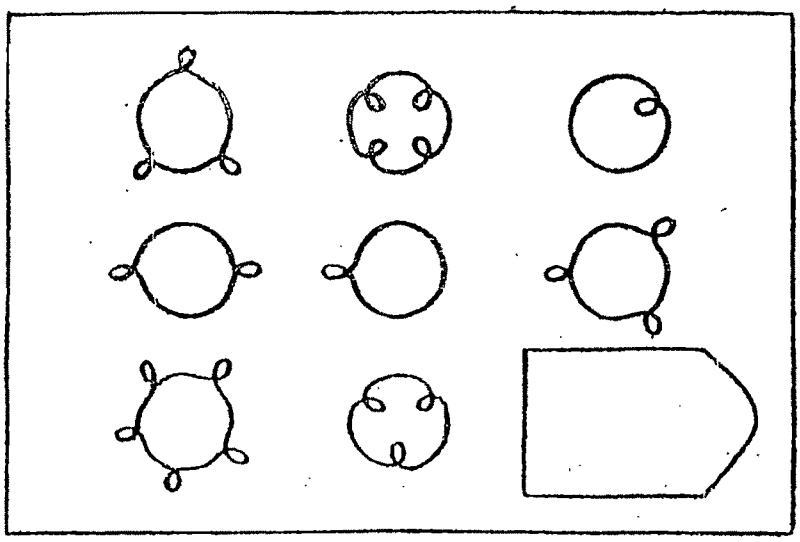
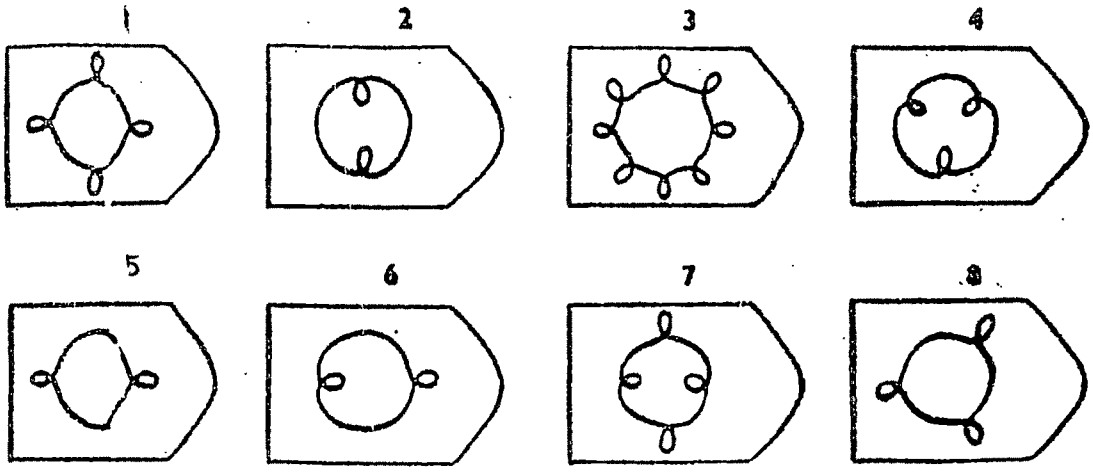
E II





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THE DESIGN AND USE OF THE SCALE

" . . . To understand the respective natures of eduction and reproduction—in their trenchant contrast, in their ubiquitous co-operation and in their genetic inter-linkage—to do this would appear to be for the psychology of individual abilities and even for that of cognition in general, the very beginning of wisdom." (C. SPEARMAN.)

While the Mill Hill Vocabulary Scale is designed to assess a person's ability to recall acquired information, Progressive Matrices (1938) was constructed on the *a priori* assumption that if Spearman's principles of noegenesis were correct, it should provide a test suitable for comparing people with respect to their immediate capacities for observation and clear thinking. Reported investigations show how far, and under what conditions, these two complementary tests provide a practical means of assessing a person's intellectual development, trainability or mental impairment.

Progressive Matrices (1938) is a test of a person's capacity at the time of the test to apprehend meaningless figures presented for his observation, see the relations between them, conceive the nature of the figure completing each system of relations presented, and, by so doing, develop a systematic method of reasoning.

The scale consists of 60 problems divided into five sets of 12. In each set the first problem is as nearly as possible self-evident. The problems which follow become progressively more difficult. The order of the tests provides the standard training in the method of working. The five sets provide five opportunities for grasping the method and five progressive assessments of a person's capacity for intellectual activity. To ensure sustained interest and freedom from fatigue, the figures in each problem are boldly presented, accurately drawn and, as far as possible, pleasing to look at. The scale is intended to cover the whole range of intellectual development from the time a child is able to grasp the idea of finding a missing piece to complete a pattern, and to be sufficiently long to assess a person's maximum capacity to form comparisons and reason by analogy without being unduly exhausting or unwieldy. The scores obtained by adults tend to cluster in the upper half of the scale, but there are enough difficult problems to differentiate satisfactorily between them.

Everyone, whatever his age, is given exactly the same series of problems in the same order and is asked to work at his own speed, without interruption, from the beginning to the end of the scale. As the order of the problem provides the standard training in the method of working, the scale can be given either as an individual, a self-administered or as a group test. A person's total score provides an index of his intellectual capacity, whatever his nationality or education.* The contribution which each of the five sets makes to the total provides a means of assessing the consistency of the estimate and the psychological significance of discrepancies in the test results.

* From published correlations between children's scores on Progressive Matrices (1938) and tests of reading, spelling and elementary arithmetic, the scale appears to justify this claim, although conclusions based on score correlations can never be accepted uncritically.

It is often useful to describe the scale as a test of observation or clear thinking. *By itself* it is not a test of "general intelligence" and it is always a mistake to describe it as such. Each problem in the scale is really the "mother" or "source" of a system of thought—hence the name "Progressive Matrices". The scale has a re-test reliability varying, with age, from 0.83 to 0.93. It correlates 0.86 with the Terman-Binet test, and has been found to have a G saturation of 0.82.†

Young children, mentally defective persons and very old people are not expected to solve more than the problems in Sets A and B of the scale and the easier problems of Sets C and D, where reasoning by analogy is not essential. After they can no longer solve the problems, they may still choose the correct answer for other reasons. For normal adults, Sets A and B provide little more than training in the method of working. If a person is allowed only a limited time and does not complete the easy problems of Sets D and E before stopping, the total estimate is not necessarily valid. When the 1938 scale was constructed, these limitations were known. Enquiries carried out since 1938 have shown that in practice, as an untimed capacity test and also as a 20-minute speed or "efficiency" test, the results obtained with adults are more reliable and psychologically valid than one might expect from so few effective problems arranged in sets of overlapping difficulty. As originally intended, the scale has in practice proved to be suitable for use with both adults and children.

For comparative studies, the standard 1938 scale is now used internationally. No general revision of it appears to be either necessary or desirable.* From the results obtained with it, derivatives can always be constructed to meet particular demands. In 1947, two such derivatives were prepared for further experimental work.

Progressive Matrices (1947), Sets A, Ab, B have been constructed for use with young children and old people, for anthropological studies and for clinical work. They are arranged so that they can be used satisfactorily with people who, for any reason, cannot understand or speak the English language, suffer from physical disabilities, are intellectually sub-normal or have deteriorated. A transitional set of 12 problems is placed between Sets A and B of the 1938 scale. The three sets together cover the cognitive processes of which children under 11 years of age are usually capable.

To make the test independent of verbal instructions, the problems are printed on coloured backgrounds and the scale arranged so that it can be presented in the form of illustrations printed in a book or as boards with movable pieces. When the latter form is used, a person has simply to be shown that each of the movable pieces fits the gap in the board but that only one completes the design. By placing a selected piece in position, a person sees the results of his judgements. This trains him in the method of working and teaches him to be careful. Solutions by trial and error can be clearly distinguished from solutions by direct perception and inference. By omitting the former, the results obtained with Sets A, Ab, B can be compared with the results obtained with Progressive Matrices (1938).

† Professor Sir Cyril Burt—Data based on test results of 1,000 seamen placed before the War Cabinet Expert Committee on the work of psychologists and psychiatrists in the Services.

* In 1947, a small correction was made to the original test B.8.

Before the capacity to form comparisons and reason by analogy has matured, or in cases where it has become impaired, Sets A, Ab, B can be used to assess the degree to which a person's capacity for observation and clear thinking has developed or the level to which it has deteriorated. After the capacity to reason by analogy has developed, Progressive Matrices (1938) is the more suitable scale to use. If, on using them, Sets A, Ab, B prove to be too simple, they can be immediately followed by Sets C, D and E of the 1938 scale. By omitting a person's score on Set Ab, his total score on Sets A, B, C, D and E can be used to assess his percentile grade from the published norms for Progressive Matrices (1938).

Progressive Matrices, 1947, Sets I and II have been constructed for use with persons over 11 years of age of average or more than average intellectual ability. They can be used without a time limit in order to assess a person's maximum capacity for observation and clear thinking, or with a time limit to assess his speed of accurate intellectual work. In the first set, there are 12 problems. They are designed to introduce a person to the method of working. In the second set, there are 48 problems. In presentation and argument, they resemble the problems in Sets C, D and E of the 1938 scale. So that the validity of the total score does not depend upon everyone attempting all the problems in the scale before stopping, they are arranged in groups of 4 according to argument and order of difficulty. An adult of superior intellectual capacity takes at least half-an-hour to solve them all, while a person's interest and attention are usually maintained for more than an hour without boredom. Set I will indicate in a few minutes whether a person can be regarded as intellectually "dull", "average" or "bright". If a person appears to be of average or more than average ability, it can be followed by Set II and the estimate made more exact. To assess a person's "efficiency" in the sense of his speed of accurate intellectual work, he can be asked to solve as many problems as he can in Set II in a specified time. The time allowed can be varied to obtain a desired score distribution.

COMPARATIVE STUDIES

I. With the Mill Hill Vocabulary Scale, Progressive Matrices (1938) has been used to study normal changes in the recall of information and in present cognitive activity between 6 and 65 years of age. Exact information is still needed concerning fluctuations of these activities in health and illness. We still need to know the degree to which differences between test and re-test scores are due to functional variations in the person tested, to the form of the test, or to both. We also need to know how far the high re-test reliability of such tests as the Mill Hill Vocabulary Scale arises from the test's insensitivity to variations of mental activity.

We need to know both the merits and demerits of using the Matrices and Vocabulary Tests together in place of a single test of what is called "general intelligence", and the relative validity of each for predicting a person's capacity to profit from any particular course of training he wishes to pursue and his adaptability in applying his knowledge to fresh situations and problems. We know that the acquisition and utilisation of knowledge depend upon a person's environment as well as upon his individual capacities. We still need sociological studies designed to show how endowment and environment together affect

intellectual development. We also need psychological studies designed to show how a person's attitude to his environment and to his own abilities affects the use he makes of his opportunities. At the same time we need critical, experimental and statistical studies concerning the psychological determinants of skilful conduct and the value of (a) verbal tests designed to assess the recall of acquired knowledge, (b) perceptual tests designed to assess present clarity and rate of thinking and (c) tests of what is perhaps best called "anticipatory awareness" designed to assess general and specific aptness of perception and conduct.

II. Work so far carried out with Sets A, Ab, B suggests that neither the development nor the decline of mental activity, with age, is of a single kind or at a single rate. Between 3 and 6 years of age a child's interest and attention appear to vary too much for a test of his immediate cognitive activity, by itself, to be a highly reliable indication of his subsequent intellectual development. In addition to this, somewhere between 8 and 11 years of age there appears to be a rapid development, if not a complete transformation, in a child's processes of reasoning. This, perhaps decisive, stage in intellectual maturation appears to be one of the earliest to decline in later life and one which may or may not be impaired as the result of brain injury. We still need to study more exhaustively individual, group and racial differences in the nature and rate of intellectual maturation. We also need clinical studies designed to show differences in the test performances characteristic of intellectual deficiency or loss of intellectual ability due to senility, brain injury or other physical disabilities. The knowledge acquired from these studies may lead to further revisions of this test and modifications of it for particular purposes such as for use with blind people, or for people suffering from localised brain damage.

III. A person's "maximum capacity" for clear thinking has been found to vary with health and improve with practice less than his speed of accurate intellectual work. More systematic information is needed concerning the effects which both ill-health and intentional training have upon a person's test performance and the relative merits of Set II of the 1947 Matrices as an untimed capacity test and as a timed efficiency test of average to superior intellectual ability. We know that certain problems in this Set need to be modified and that they are not in their absolute order of difficulty, but the test is free from the limitations of Progressive Matrices (1938) used with a time limit. The re-test reliability of Set II has been found to increase rapidly after 11 years of age. Low re-test reliability before the age of 11 years appears to be due, in part at least, to the fact that before this age, a child's ability to form comparisons and reason by analogy is often too recent an intellectual development for it to be exercised with a consistent degree of efficiency. We need to know more about the test's formal constitution and functional consistency. We need to determine more exactly its re-test reliability at different ages and sensitivity to fluctuations in intellectual output. We also need to demonstrate its value as a means of diagnosing temporarily impaired intellectual efficiency, or for predicting short- and long-term success in any course of work a person chooses to pursue. Finally, the effect of chance solutions on the total estimate, which this test shares with all tests of the multiple choice type, needs to be studied more thoroughly. The information obtained should lead to a revision of this test and derivatives of it, which can be used satisfactorily alone or in batteries with other tests.

It is anticipated that these three groups of comparative studies will provide information of basic psychological importance, as well as prepare the way for future revisions or derivatives of the tests used.

The history of mental testing is outlined, and the uses and limitations of mental tests are discussed, in a book, "Human Nature, its Development, Variations and Assessment".* For information concerning the psychological theory on which Progressive Matrices (1938) and the Mill Hill Vocabulary Scales are based, users are advised to read this book. The book also discusses the consistency, re-test reliability and psychological validity of mental tests in relation to the ways in which the tests are presented, their sensitivity to fluctuations in the mental functions assessed, and their resulting practical usefulness for assessing individual differences in, and variations of, mental activity in health and illness. Such questions are not discussed in the Guides to using either Progressive Matrices (1938) or the Mill Hill Vocabulary Scale. They provide only the standard procedures for administering and marking the tests.

An adequately designed and standardized mental test could not be the work of one person, and I would like to record my indebtedness to Professor Aveling who, until his death, directed my studies, to Professor Spearman with whom I had the pleasure of working, and to Professor Burt for his correspondence and publications. Perhaps even more I am indebted to Professor Penrose, in whose Unit at the Royal Eastern Counties Institution I was first able to give the whole of my time to psychological research, and to Dr. P. K. McCowan, Physician Superintendent of The Crichton Royal, who has made it possible for the work to continue and develop. Most of all, I am indebted to my colleagues and the many people whose co-operation has made the work so far successful.

* "Human Nature, its Development, Variations and Assessment" (1952), J. C. Raven (H. K. Lewis & Co., Ltd., London).

INSTRUCTIONS FOR USING PROGRESSIVE MATRICES (1938)

THE INDIVIDUAL TEST

Particulars of the person to be tested are filled in on the record form. The person giving the test opens the book at the first illustration, A.1, and says: "Look at this (pointing to the upper figure). It is a pattern with a bit taken out. Each of these bits below (he points to each in turn) is the right shape to fit the space but they do not all complete the pattern." He explains why numbers 1, 2 and 3 are wrong and why number 6 is nearly right. He then says: "Point to the piece which is quite right." If the person does not point to the right piece he continues his explanation until the nature of the problem to be solved is clearly grasped.

The person giving the test explains that on every page there is a pattern with part left out, and says: "All you have to do is to point each time to the bit which is the right one to complete the pattern." As he turns to illustration A.2, he says: "They are simple at the beginning and get harder as you go on. If you pay attention to the way the easy ones go, you will find the later ones less difficult. Just point to the piece which completes the pattern. Now carry on at your own pace. See how many you can get right. You can have as much time as you like. There is no need to hurry. Be careful. Remember each time only one bit is quite right."

The person giving the test records the number of the piece pointed to in each test in the appropriate place on the record form. He sees that the pages are turned over one at a time. If necessary, he guides the person's attention to each problem in its standard order. Apart from this, he gives no assistance in the method of working, as the standard order in which the problems are presented provides the necessary training.

THE SELF-ADMINISTERED OR GROUP TEST

Materials

A set of test books is required. These can be used repeatedly. Each person requires a record form and pencil. Illustrations of the record form and test A.1, drawn twice the original size, can be used for demonstration purposes. Stencil keys facilitate rapid marking.*

Accommodation

The test can be given to a group of any size according to accommodation. Approximately one hour must be allowed for each group tested. Persons to be tested are seated comfortably at tables with room for books and record forms and sufficiently apart to prevent copying. Space is left so that supervisors can pass easily between people without disturbing them. They should all face the person in charge. When a person does the test by himself, he should be seated comfortably at a table in a quiet room.

* Stencil marking keys are obtainable from H. K. Lewis & Co., Ltd., 136 Gower Street, London, W.C.1.

Procedure

Pencils and record forms are distributed. The people to be tested are asked to fill in particulars about themselves on the record form. When this has been done the test books are given out. They are asked not to open the books until everyone is ready.

The person in charge says: "Open your books to the first page. It is like this." He opens a book or demonstration enlargement for the group to see. "At the top it says Set A and you have a column A here, on your scoring form. This is A.1. You see what it is. The upper part is a pattern with a bit missing. Each of these bits below (he points to each in turn) is the right shape to fit the space, but they do not all complete the pattern. Number 1 (he points to the bit and then to the pattern) is quite the wrong pattern. Numbers 2 and 3 are wrong—they fit the space, but they are not the right pattern. What about number 6? It is the right pattern (he illustrates that the pattern is the same as the pattern above) but it does not go all over. Put your finger on the one that is quite right." The person in charge notices if this is done correctly. If necessary he gives further explanation and then says: "Yes, number 4 is the right one. So the answer to A.1 is 4—write 4 here, against number 1 in Column A on your scoring form. Do not turn over yet."

The person in charge waits for everyone to finish and continues: "On every page in your book there is a pattern with a bit missing. You have to decide each time which of the bits below is the right one to complete the pattern above. When you have found the right bit you write the number of it down on your scoring form against the number of the pattern. They are simple at the beginning and get harder as you go on. There is no catch. If you pay attention to the way the easy ones go you will find the later ones less difficult. *Try each in turn, from the beginning right to the end of the book.* Work at your own pace. Do not miss any out. Do not turn back. See how many you can get right. You can have as much time as you like. Turn over and do the next one."

When sufficient time has been allowed for everyone to write down the answer to A.2, the person in charge says: "The right one of course is number 5. See that you have written the figure 5 against number 2 in Column A on your form. Go on like that by yourselves until you get to the end of the book."

Supervision

Mistakes occur in filling up the record form. Supervisors should see that each person has entered correctly on his form his own solutions to the first five problems. Once a person has grasped the nature of the initial problems, supervisors give no further assistance in the method of reasoning but see that each person records his own choices correctly.

People frequently omit a problem. Fifteen minutes after the commencement of the test, supervisors see that each person is still recording his choices against the correct numbers on his record form.

After about half an hour people are asked to indicate when they have finished. When they do, supervisors see that the record form has been filled up correctly and that every problem has been attempted. As people finish they are asked to give in their books and go out, or to proceed to the next test if there is one.

For purposes of timing, the test is taken to begin when the person in charge says: "Turn over and do the next one (A.2) yourself." The time of ending the test is noted as scoring forms are handed in.

RECORDS AND MARKING

When the series is given as an individual test, the person recording results enters on the form the number of each piece pointed to. If a person points to more than one piece, the piece he finally points to counts right or wrong. If a person given the group test enters more than one number against any item in the scale, he must be told to cross out all but the right one. If the mistake is not observed until after the test is over, the number on the extreme right only is considered, whether the other numbers are right or wrong.

The standard record form is arranged so that it can be quickly and accurately marked by superimposing a stencil marking key.

A person's score on the scale is the total number of problems he solves correctly when he is allowed to work quietly through the series from the beginning to the end.

By subtracting from a person's score on each of the five sets the score normally expected on each set for the same total score on the scale, the consistency of his work can be assessed. The score to be expected is given in TABLES I or II. The difference between the score a person obtains on each set and that normally expected for his total score can be shown numerically as follows:—

"Discrepancies: 0, —1, +2, —2, +1."

If a person's score on one of the sets deviates by more than 2, his total score on the scale cannot be accepted at its face value as a consistent estimate of his general capacity for intellectual activity. For general purposes the total score appears to be relatively valid even when discrepancies of more than 2 points occur in the break-up.

In a certain proportion of cases a person selects a right figure by chance. When a person is allowed to complete the whole of the scale, the number of chance selections will be proportional to the number of problems in which he fails. People who obtain low scores have a proportionately greater number of successes by pure chance. To this extent low total scores are always less consistent and reliable than high scores

The most satisfactory method of interpreting the significance of a person's total score is to consider it in terms of the frequency with which a similar score is found to occur amongst people of his own age. This method shows at once his intellectual capacity relative to other people of his own age and the frequency with which one should expect to find people of similar capacity. It has the advantage that no *a priori* assumption is made that in childhood the development of intellectual capacity is necessarily uniform, or that at maturity it is necessarily distributed symmetrically throughout the general population.

For practical purposes it is convenient to take certain fixed percentages of the population and to group people as their scores fall between them. In this way it is possible to classify a person according to the score he obtains as:—

GRADE I or *"intellectually superior"*, if his score lies at or above the 95th percentile for people of his age.

II *"definitely above the average in intellectual capacity"*, if his score lies at or above the 75th percentile;

II+, if his score lies at or above the 90th percentile.

III *"intellectually average"*, if his score lies between the 25th and 75th percentiles;

III+, if his score is greater than the median or 50th percentile for his age;

III—, if his score is less than the median.

IV *"definitely below average in intellectual capacity"*, if his score lies at or below the 25th percentile;

IV—, if his score lies at or below the 10th percentile.

V *"intellectually defective"*, if his score lies at or below the 5th percentile for his age-group.

The necessary percentile scores for the individual and group tests between the ages of 6 and 65 are shown in TABLES III, IV and V. The individual test appears to introduce emotional factors which are less operative when a person is allowed to work quietly at his own speed. The self-administered or group test appears to provide a more reliable sample of a person's output of intellectual activity during the test. People over 30 years of age can be graded I, II, III or IV, but there is at present insufficient data to distinguish between people who are Grade IV and those who are Grade IV— or Grade V.

The consistency of an estimate, the total score obtained, the time required and the grade reached are conveniently summarized as follows:—

Total score 46	Discrepancies ..... 0, +1, —2, +2, —1.
Grade .... III+	Time .... 38 minutes.

For reasons already given, Progressive Matrices (1938) does not differentiate very clearly between young children, or between adults of superior intellectual capacity. It cannot be given satisfactorily with a time-limit and takes up to 45 minutes to complete. These appear to be the chief criticisms of the scale. Neither shortening the test, making it longer, dividing it, making it continuous, nor re-arranging the problems overcomes them, without limiting the usefulness of the scale as a whole. It has, however, been possible to construct derivatives of the 1938 scale to meet each limitation separately.

KEY

	Set				
	A	B	C	D	E
1	4	2	8	3	7
2	5	6	2	4	6
3	1	1	5	3	8
4	2	2	8	7	2
5	6	1	7	8	1
6	3	3	4	6	5
7	6	5	5	5	2
8	2	6	1	4	4
9	1	4	7	1	1
10	3	3	6	2	6
11	4	4	1	5	3
12	5	5	2	6	5

NORMAL SCORE COMPOSITION

TABLE I.—THE INDIVIDUAL TEST

Expected score on each set	*Total Score* 10	15	20	25	30	35	40	45	50	55
A	6	8	9	10	10	10	10	11	12	12
B	2	4	6	7	8	8	9	10	11	11
C	1	2	3	4	6	7	8	10	10	11
D	1	1	2	3	4	7	9	9	10	11
E	0	0	0	1	2	3	4	5	7	10

TABLE II.—THE SELF-ADMINISTERED or GROUP TEST

Total	A	B	C	D	E	Total	A	B	C	D	E	Total	A	B	C	D	E
15	8	4	2	1	0	30	10	7	6	5	2	45	12	10	9	9	5
16	8	4	3	1	0	31	10	7	7	5	2	46	12	10	10	9	5
17	8	5	3	1	0	32	10	8	7	5	2	47	12	10	10	9	6
18	8	5	3	2	0	33	11	8	7	5	2	48	12	11	10	9	6
19	8	6	3	2	0	34	11	8	7	6	2	49	12	11	10	10	6
20	8	6	3	2	1	35	11	8	7	7	2	50	12	11	10	10	7
21	8	6	4	2	1	36	11	8	8	7	2	51	12	11	11	10	7
22	9	6	4	2	1	37	11	9	8	7	2	52	12	11	11	10	8
23	9	7	4	2	1	38	11	9	8	8	2	53	12	11	11	11	8
24	9	7	4	3	1	39	11	9	8	8	3	54	12	12	11	11	8
25	10	7	4	3	1	40	11	10	8	8	3	55	12	12	11	11	9
26	10	7	5	3	1	41	11	10	9	8	3	56	12	12	12	11	9
27	10	7	5	4	1	42	11	10	9	9	3	57	12	12	12	11	10
28	10	7	6	4	1	43	12	10	9	9	3	58	12	12	12	12	10
29	10	7	6	5	1	44	12	10	9	9	4	59	12	12	12	12	11

NORMS

TABLE III.—INDIVIDUAL TEST

Working percentile points calculated from the natural scores of 735 Colchester children.

Percentile Points	Chronological Age in Years															
	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	12	12½	13	13½
95	19	22	25	28	33	37	39	40	42	44	47	50	52	53	54	54
90	17	20	22	24	28	33	35	36	38	41	44	48	49	49	50	50
75	15	17	19	21	23	26	29	31	33	35	38	42	43	45	46	46
50	13	14	16	17	19	21	22	24	26	29	31	35	37	38	40	41
25	—	—	13	14	14	16	17	18	20	23	26	28	30	31	32	33
10	—	—	—	—	—	13	13	14	14	15	20	21	23	24	25	26
5	—	—	—	—	—	—	—	—	13	14	16	18	19	20	21	22

TABLE IV.—THE SELF-ADMINISTERED or GROUP TEST (CHILDREN)

Working percentile points calculated from the natural scores of 1,407 children.

Percentile Points	Chronological Age in Years												
	8	8½	9	9½	10	10½	11	11½	12	12½	13	13½	14
95	38	39	41	43	45	48	50	51	51	52	52	53	53
90	34	36	38	41	43	45	47	49	49	50	50	51	52
75	24	29	32	34	37	39	41	43	45	46	47	48	48
50	18	21	24	28	30	33	35	37	39	41	43	44	44
25	—	14	16	18	20	23	26	29	32	34	35	37	38
10	—	—	—	13	13	15	16	18	22	25	27	28	28
5	—	—	—	—	—	13	14	15	16	17	19	21	23

TABLE V.—THE SELF-ADMINISTERED or GROUP TEST (ADULTS)

Working percentile points calculated from the natural scores of 3,665 Militiamen and 2,192 Civilians

Percentile Points	*Chronological Age in Years*									
	20	25	30	35	40	45	50	55	60	65
95	55	55	54	53	52	50	48	46	44	42
90	54	54	53	51	49	47	45	43	41	39
75	49	49	47	45	43	41	39	37	35	33
50	44	44	42	40	38	35	33	30	27	24
25	37	37	34	30	27	24	21	18	15	13
10	28	28	25	—	—	—	—	—	—	—
5	23	23	19	—	—	—	—	—	—	—

In Tables III, IV and V, the median score at each age is shown in heavy type.

Figures in italics have been interpolated for smooth working.

One person in 20 may be expected to obtain a score at or above the 95th percentile point. Similarly one person in 20 may be expected to obtain a score at or below the 5th percentile point. One person in 10 may be expected to obtain a score at or above the 90th percentile point, and one in 10 at or below the 10th percentile point. One person in 4 may be expected to obtain a score at or above the 75th percentile point, and one in 4 at or below the 25th. The score obtained by one person in every two may be expected to fall between the 25th and 75th percentile points.

Too few dull people over 80 have, as yet, been tested for the 5th and 10th percentile points to be accurately determined.

TABLE VI.

Relationship between Percentile Grade and Terman Merrill Intelligence Quotient for a clinic group of 301 children given each test individually.

Progressive Matrices (1938) *Percentile Group*	*Grade*	*Terman Merrill I.Q.* Under 73	Under 89	89 to 111	Over 111	Over 127	Totals
95 and over	I	—	—	6†	6	17	29
75 and over	II	—	3†	20	19	14	56
Over 25 and under 75	III	2†	20	85	15	10*	132
25 and under	IV	9	23	16	—	—	48
5 and under	V	23	9	1*	—	—	36
Totals		37	55	128	40	41	301

† Of the individuals with Terman Merrill Intelligence Quotient two classes lower than their Matrices Grade, 9 had specific defects in reading, speech or education.

* Of the individuals with Terman Merrill Intelligence Quotient two classes higher than their Matrices Grade, 3 were excitable, talkative, social failures or lacking in self-control.

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