



ITB
Consulting GmbH

THE SELECTION TEST
OF THE
KARL LANDSTEINER UNIVERSITY OF
HEALTH SCIENCES
2017
INFORMATION BROCHURE

THIS BROCHURE IS AVAILABLE FREE OF CHARGE AT

WWW.KL.AC.AT

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Important Pointers

Be at your assigned test location on your test date **20th May 2017** by 8:00 am. You must have valid official photographic identification (preferably your passport or another government-issued identification card), a printout of your invitation to the test, and writing utensils (ballpoint pens or felt-tip pens) with you. There will be no pens available at the test location. Please note which objects you are permitted to take into the test room with you.

Later you will be told whether you have been admitted to the second selection round (selection interview).

THE MOST IMPORTANT FACTS AT A GLANCE

- To take the selection test of the Karl Landsteiner University of Health Sciences, you must register online. You can register online between **February 1st and April 23rd 2017** (www.kl.ac.at/application).
- To be admitted to the test room, you must have valid official photographic identification and the invitation to the test with you. Please also bring two writing utensils (pens).
- The selection test takes approximately five hours including the registration procedure, the admission to the test room and the introduction to the test.
- Prepare well for the test. Work through the example test items and read the instructions for the various subtests carefully. Find out well in advance the best way to get to the test centre.
- You may not take the following objects into the test room with you: books, calculators, mobile phones (even if they are switched off), smartwatches, tablet PCs, cameras, PDAs, notebooks, MP3 players, spectacle cases, pencil cases, jackets, backpacks, purses, cloth bags, non-transparent plastic bags.
- Food and writing utensils are permitted; they can be carried in a transparent plastic bag (like at the airport).
- Please follow the test administrator's instructions closely. These instructions, as well as the instructions provided in written form and online, are essential.
- During the time allotted to a certain subtest, you may page back and forth in the test booklet only within that subtest.
- The selection procedure consists of two parts: the first part is the selection test. Those persons who receive the highest scores on the test will be admitted to the second part of the selection procedure: a verbal selection round (interview).

OVERVIEW

WHAT WILL I LEARN IN THIS BROCHURE?

This brochure gives you an overview of the concept behind the Selection Test of the Karl Landsteiner University of Health Sciences and it outlines how the test is structured. Then it will give explanations of how the test is administered and graded, and you will receive pointers on how to best prepare for the test.

Finally, we will give you the opportunity to familiarize yourself with the test by reading the original instructions and working through a number of example test items.

For information on the second selection round (an interview), please see our website (www.kl.ac.at/application or <http://www.kl.ac.at/en/admission/application>).

THE SELECTION TEST OF THE KARL LANDSTEINER UNIVERSITY OF HEALTH SCIENCES

The Selection Test of the Karl Landsteiner University of Health Sciences is a general scholastic aptitude test. It tests abilities that are important to successfully study at the university level. The test is an **objective aptitude assessment tool** which makes the same demands on all applicants. A new version of the test is used on each test date, but the basic structure remains the same. **No specific knowledge is required to take the test.** The focus of the test is neither on specialized knowledge nor on aspects of aptitude already expressed in the A-levels (or equivalent general certificates of education). All of the information needed to solve the items is provided in the texts and graphs of the items themselves. The test consists of altogether four different subtests which the test participants work through one after the other without a break. The test itself lasts approximately 3.5 hours.

The following table gives you an overview of the test structure:

| SUBTEST | NO. OF ITEMS | ALLOTTED TIME |
|-------------------------------|--------------|---------------|
| ANALYZING GRAPHS AND TABLES | 22 | 60 min. |
| ANALYZING TEXTS | 22 | 65 min |
| SOLVING QUANTITATIVE PROBLEMS | 22 | 50 min |
| IDENTIFYING RULES | 22 | 35 min |

THE TEST PROCEDURE

Timing

The **administration** of the selection test, including the registration procedure, admission to the test room, and an introduction to the test, **takes** approximately **5 hours**.

On the test date, please be at the test location by 8:00 am. The registration will begin at 8:00 am; the admission controls will begin at **8:45 am**, and all important general pointers on taking the test will then be given. Subsequently – at **9:15 am** at the latest – the actual test will begin. **You will not be allowed to enter the test room if you come late**, even if you are not responsible for the delay. **The test is normally finished at about 1:15 pm.** However, when you make your train or flight reservations, please plan with plenty of extra time. We cannot pay the costs of cancellations, reservation changes, etc. if the test ends later.

Detailed Information on the Test Procedure

To register you need valid official photographic identification (preferably your **passport** or another **government-issued identification card**). The test room is divided into different sections. Registration is carried out by section. Therefore, when you arrive, please go to the registration area for your section. **Your section is marked on your invitation to the test.** When you register, your **photo identification document** and your **invitation** will be checked, and you will receive a **stamp on the back of your hand** confirming your registration. While you are taking the test, you must leave your photo identification document lying in front of you on the table at the upper right. This ensures that no one takes the test under a false name.

You must also bring a printout of your invitation with you. You will not be admitted to the test room unless you can identify yourself and submit your personal invitation. When you register, you will receive a label which will tell you your seat assignment.

Please also bring **at least two writing utensils** (pens) with you. A watch (unless it does have a calculator function or is a smartwatch) and a marker can also be helpful. You may not bring your own paper with you, for example to make notes. You may, however, use all of the blank spaces in the test booklet to make notes. **No other aids, for example books, calculators, mobile phones** (even if they are switched off), **cameras, smartwatches, tablet PCs, PDAs, notebooks, MP3 players, spectacle cases, pencil cases, jackets, backpacks, purses, cloth bags or non-transparent plastic bags**, are permitted. You will be provided with a place to keep all your belongings not permitted inside the test room. You are permitted to take food, beverages, handkerchiefs and your wallet into the test room, but you must carry all such items in completely transparent containers. Non-transparent or partially transparent containers (for example plastic food containers) are not permitted.

To ensure that the test procedure is not disturbed, you should interrupt your processing of the test only to go to the restroom. You cannot make up the time you lose by going to the restroom. If you are dependent on special aids for health reasons, please inform us in time by writing an e-mail to admission@kl.ac.at, if possible two weeks before the test date. You do not have to inform us about medicine you need to take during the test administration.

THE TEST PROCEDURE

A participant who breaks off in the middle of the test will receive a result corresponding to the score he¹ earned up to the point where he broke off the test. A participant who feels that his performance is being negatively affected (for example by noise) must inform the test administrator immediately and request that a record be made of his complaint. No test results will be improved retroactively, and the test cannot be repeated.

After a brief welcome, a sheet entitled "General Test Instructions" will be handed out. Please follow these pointers very closely. If you have questions about the pointers, please ask them before you begin working through the test items.

The maximum processing times for the individual subtests are equal for all participants. The time allotment is given at the beginning of each subtest. The test administrator will also announce the time allotments and inform you when it is time to turn to the next subtest. If you have finished all of the items in one subtest before the allotted time is over, you can use the remaining time to check your solutions. To do so, you may page back and forth within the subtest. **You are not permitted to use this time to work on items belonging to another (previous or following) subtest.** All of the subtests are designed according to the so-called multiple-choice principle. **For each item, several possible answers are given; in each case, only one of those suggestions is correct.** When you receive the test booklet, you will also receive an answer sheet. On the answer sheet, under the solution letters following each item number, you will find up to eight little boxes. Please put an "x" in the box under the correct solution. You may use a ballpoint pen or felt-tip pen (black or blue).

Example

| Question (in test booklet): | | Answer (on answer sheet): | | | | |
|-----------------------------|----------------------------|---------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|
| 0) | How much is 2×2 ? | | A | B | C | D |
| (A) | 12 | 0 | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| (B) | 4 | | | | | |
| (C) | 5 | | | | | |
| (D) | $\frac{1}{2}$ | | | | | |

If you notice that – as in the above example – you have put an "x" in the wrong box, you can make this answer invalid by drawing a circle around the box and putting an "x" in the box for the right answer:

| | | A | B | C | D |
|---|--|--------------------------|-------------------------------------|-------------------------------------|--------------------------|
| 0 | | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

If you later decide that your first answer is the correct answer after all, draw a circle around your second answer and write the letter of your first answer at the end of the line.

¹ In the interest of better readability, participants will be referred to in this brochure in the masculine form; the latter applies to both men and women.

THE TEST PROCEDURE

If you give more than one answer for an item, the item will count as being unsolved. **Please note that only the answer sheet will be graded**, and marks you make in the test booklet cannot be taken into consideration. We therefore recommend that you mark your solutions on the answer sheet immediately. You may transfer your answers from the test booklet to the answer sheet only within the time allotted to the respective subtest; no transfers of answers are permitted at a later time.

You should mark an answer for every item. If you do not have time to work through all of the items or cannot solve an item, choose an answer randomly. You may be able to earn a few additional points and improve your final score slightly with random guesses. On the other hand, you are not in any danger of lowering your score, because no points are subtracted for wrong answers or for items you have not worked through.

The test administrator will not answer any questions about the contents of the individual items, because your ability to understand the items is part of what you are being tested on. (You may, however, ask a question if you think that there is a misprint in the test booklet.)

Please remain seated even if you have finished working through all of the items in a subtest before the allotted time is over. If you would leave the test room, it would disturb those persons who are still working on the test.

If you do leave the test room (for example to go to the restroom), please do so as quietly as possible to not disturb other participants. Before you leave the room, hand your booklet in to the person in charge at your section. You may not leave the room until you have handed in your booklet. When you re-enter the test room, show the stamp on the back of your hand without waiting to be asked. The person in charge at your section will then return your test booklet to you. **Please take the same seat you were sitting in before.**

PREPARING FOR THE TEST

The abilities assessed with the selection test are the result of many years of learning and development, and – for the most part – can therefore not be influenced shortly before taking the test. In any case, it is useless to memorize facts in preparation for the test. **No specialized knowledge is required to solve any of the items.**

On the other hand, it is helpful to be informed in advance about the test administration procedure and conditions and the different types of items. Most test participants feel surer of themselves if they know in advance what the test will be like. Also, you save time in the test situation if you have already familiarized yourself with the pointers for the individual subtests

The following section of this brochure contains example items. They are designed to show you what kinds of items are included in the test. They will give you a good impression of the demands made on you by the test and an opportunity to see how long it takes to solve each type of item. You can work through the example items once under real test conditions; afterwards, you should take a closer look at the items you had difficulties with. You are also advised to read through the explanations of the solutions to the individual items. That will help you to identify typical kinds of mistakes and you know what to watch out for when you are taking the test.

Please do not try to make a prediction of your test score on the basis of your performance on the example items. Such a prediction would be misleading on account of the small number of example items presented here.

Your preparations for the test should include more than just working through the example items. Please find out well in advance how to get to the test location. Check to make sure that your official photographic identification will still be valid on the test date. Also remember that the test will make high demands on your stamina, resilience, ability to concentrate, and ability to cope with mental and physical stress. Above that you have the best chances of performing well if you take the test in a well-rested state.

It can also have a positive effect on your performance if you are familiar with various relaxation techniques – however unremarkable they might seem at first glance! Simple exercises such as calm, deep breathing, shaking out your hands, stretching, and adopting a relaxed sitting position can help you to loosen or avoid tension and reduce stage fright.

SENSIBLE TECHNIQUES FOR TAKING THE TEST

Even if your final score depends more on how precisely and correctly you solve the problems than on how quickly you come to your solutions, it is important to manage your time well and make the best possible use of it. **Your chances of performing well are best if you divide your time among the items evenly and work through the test carefully, but quickly.**

One important prerequisite for earning a good score on the test is to read the items carefully. If you merely skim through the text, it is all too easy to overlook information that is important to identify the correct solution.

Since the first few items in each subtest are, on the whole, easier than the following ones, it is sensible to work through the items in the order in which they appear in the test booklet. This will give you a certain amount of practice in solving the items, which will benefit you when you get to the more difficult ones. However, you should not spend too much time on items you find extremely difficult or unusual. It makes more sense to use the time to solve other items you feel more comfortable with. In any case, if you are not able to solve an item in a certain subtest, never assume that you also won't be able to cope with the following items. People have very different perceptions of how difficult an item is. It can easily happen that a person has trouble solving an item with a low level of difficulty and then has no difficulty at all with the following items, even if the majority of test takers find those items more difficult. When you are working through the test, keep the following in mind: the test is designed in such a way that the majority of participants will solve 30 to 70 per cent of the items correctly. In other words, it is almost impossible to solve all of the items correctly!

In many cases, it is best to come to a solution on your own, and then to see whether your solution is among the answers offered. If you proceed the other way around – that is, if you begin by looking at the answers – you can easily become confused, because some of the wrong answers are designed to seem plausible at first sight.

If you find you are running out of time, you still have the possibility of skimming through an item superficially and then marking the answer you think could be the right one, or of marking a random answer! No points are subtracted for wrong answers, so you can earn a few extra points by guessing.

POINTERS ON NON-PERMISSIBLE BEHAVIOUR

For taking this kind of test, it is extremely important that all participants have the same working conditions, that everyone follows the same rules, and that no one gains an advantage for himself to the disadvantage of others. Remember that, in a certain sense, all of the test participants are in a competition situation. Just like in sports, violations of the rules must therefore be penalized. You will accordingly save yourself a lot of trouble if you avoid the following conduct.

You will be given a warning if...

- you use non-permissible aids.
- you open the test booklet early. Always wait until the test administrator tells you to open the test booklet.
- you page further past the end of a subtest, or page back to one of the earlier subtests. Please always work only on the subtest the test administrator has announced. Please pay attention to the stop signs in the test booklet.
- you talk or make contact to another test participant in any way.
- you disturb another test participant.

You will be disqualified immediately if...

- you violate a rule after having received a warning. If you are disqualified for this or any of the other reasons mentioned below, you will not be permitted to take the test again at a later date.
- you take the test under a false name.
- you try to steal or reproduce the items, the answer sheet, or the "General Test Instructions" (for example by taking pictures or making written copies or sketches). Legal action will be taken against all offences.

POINTERS ON THE TEST FEEDBACK

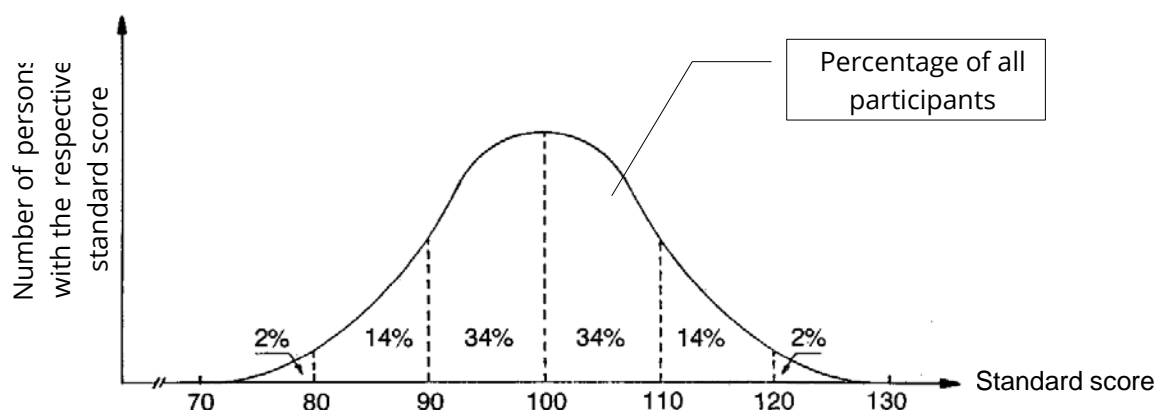
How is your test performance assessed?

First the number of graded and correctly solved items is calculated for every subtest ("**score**"), with one point being awarded for every correct solution. Some of the items are not graded because they have been included as a means of testing them for use in future tests. Wrongly answered and unanswered items are not taken into account. The next step is to calculate the "**standard score**" by converting the score earned by the test participants on each subtest to a scale with an average value of 100 and a standard deviation of 10. Then the standard scores of the respective subtests are added before a renewed standardization is carried out.

In general, if a test participant's standard score on a subtest is greater than 100, then the performance of that test participant was above average. If the standard score is less than 100, the candidate's performance was below average – always in relation to the total number of participants. "Average" is not to be understood here in the colloquial sense as "ordinary" or "mediocre". In a random sample with many well-suited persons, the "somewhat weaker" candidate is, in absolute terms, still good!

Approximately 34 per cent of all test participants achieve a standard score between 100 and 110, and the same percentage achieves a value between 90 and 100. Approximately 48 per cent of all participants achieve a value between 100 and 120, and the same percentage achieves a value between 80 and 100. Only about 2 per cent of all test participants achieve a value higher than 120, and only about 2 per cent of all test participants achieve a value lower than 80.

What is the reason for converting the score into a standard score? This conversion makes it possible to compare the results on the various subtests directly with one another or with the result earned on the overall test, even though the various subtests comprise different numbers of items. It moreover makes it possible for us to compare the test years.



The "**percentile rank**", which is also included in the feedback, informs you of the percentage of participants who have achieved a result lower than or same as yours. Unlike the standard scores, differences between percentile ranks do not allow any inferences to be drawn about the degree of difference between the scores on which they are based. A test result with a percentile rank between 30 and 70 is classified as average.

THE TEST PROCEDURE

Example: A percentile rank of 94.5 means that 5.5 per cent (100 minus 94.5) of all test participants performed better on the test than you did. In other words, 94.5 per cent achieved a result lower than or same as yours.

How can the results of the overall test be interpreted?

The assessment procedure described above also applies to the overall test. The scores achieved in the individual subtests are added and converted into standard scores. The standard score achieved in the overall test is called the **“overall test score”**. A percentile rank is also calculated for the overall test score.

EXAMPLE ITEMS

On the following pages you will be introduced to...

- the pointers for working through the individual subtests. These pointers will help you to understand what abilities are tested with each subtest and what you have to do to solve the items.
- three example items for each subtest. These examples give you an impression of the contents, difficulty and other characteristics of the respective type of item.

Here are a few pointers on working through the example items and preparing for the test:

- Only use the aids you will be permitted to use when you are taking the real test. Do not use any other aids!
- Compare your answers with the answers given in this brochure.
- Work through the solution processes carefully, even for the items you solved correctly.
- Do not, however, try to draw direct conclusions about your chances of performing well on the test from your performance on the example items.
- It is possible that some of your wrong answers are the result of having misunderstood the pointers or the contents of the items.
- Read the instructions carefully. If you prepare well, you will already be familiar with these instructions when you are taking the real test, and you will be able to use the entire processing time for solving the items.

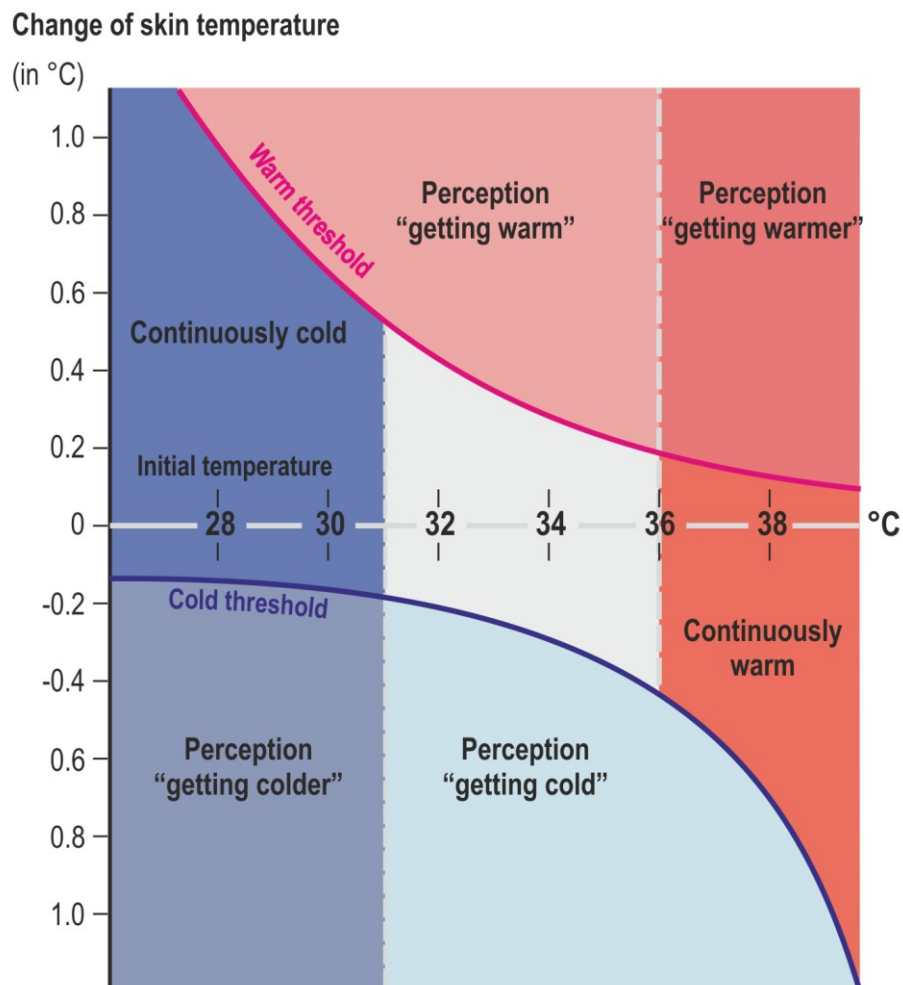
SUBTEST: ANALYZING GRAPHS AND TABLES

Working time in the original test for 22 items: 60 minutes

The following items are to test your capabilities of correctly analyzing and interpreting tables and graphs. All values are entered linearly, unless stated otherwise in the respective items. For each item, select the correct answer from the proposed solutions (A) to (D) and mark the corresponding letter on the answer sheet.

EXAMPLE ITEMS

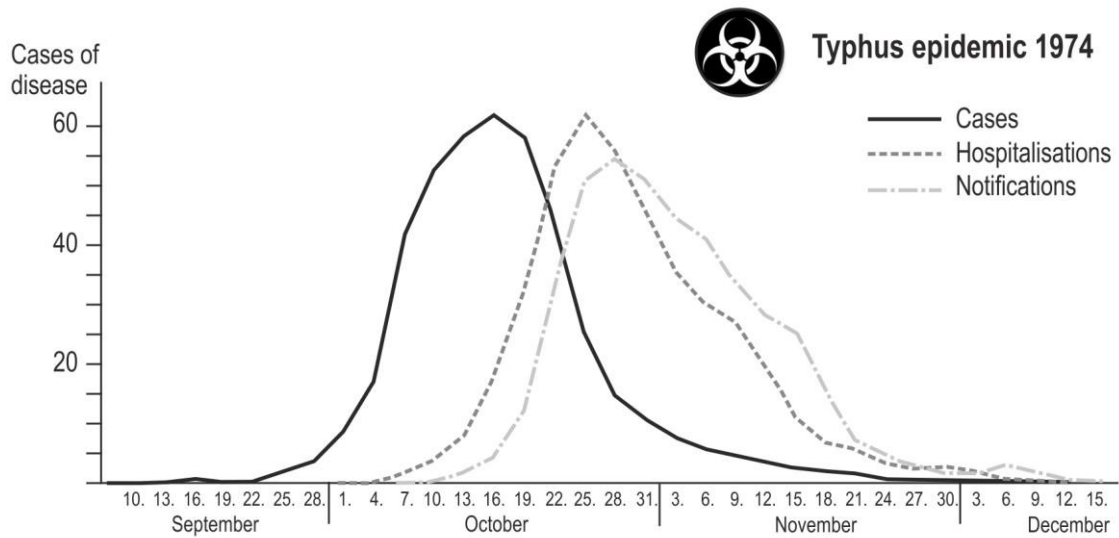
01. The graph shows the correlation between the initial temperature of a human body, an actual change in skin temperature and the corresponding perception of such a change.



Which of the following statements can be deduced from this information?

- I. Given an initial temperature of 30 °C, a change of temperature by at least 1 °C is necessary to be perceived as such.
 - II. Given a skin temperature of 32 °C, an increase by 0.5 °C is enough to trigger the perception "getting warm".
- (A) Only statement I can be deduced.
 (B) Only statement II can be deduced
 (C) Both statements can be deduced.
 (D) Neither of the two statements can be deduced.

02. The graph shows the course of a typhus epidemic in 1974. It differentiates between the number of cases (persons who fell ill), the number of admissions to hospital (hospitalisations) and the number of notifications of the health authorities.

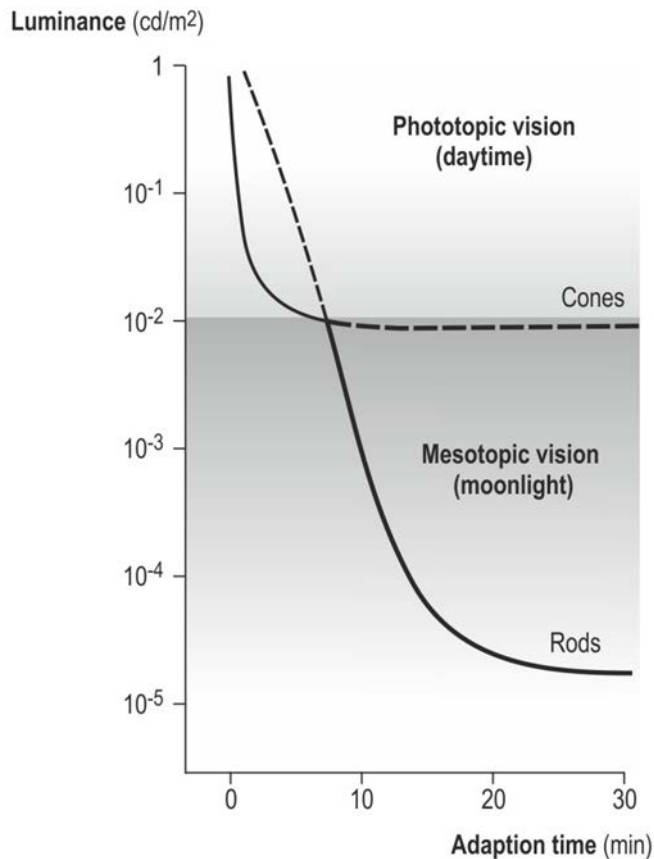


Which of the following statements can be deduced from this information?

- I. On November 15, more than 25 cases were reported to the health authorities, although only 2 or 3 persons fell ill on that day.
- II. Only every third person who fell ill on October 16 was hospitalised.

- (A) Only statement I can be deduced
- (B) Only statement II can be deduced
- (C) Both statements can be deduced.
- (D) Neither of the two statements can be deduced.

03. In the human eye, so-called "cones" and "rods" react to the incoming light. In the case of relatively high luminance (daytime light), the cone mechanism – which also enables the perception of colour – is dominant. In the case of low luminance (moonlight), vision is enabled by way of the rod mechanism, which does not allow the perception of colour. The diagram shows the transition between these two systems. It shows the adaptation time in the case of darkening, i.e. the time required by the respective systems to increase their sensitivity to the point where further vision is possible. The dashed lines show the curve in the case that the respective other system fails.



Which of the following statements can be deduced from this information?

- I. If the rod mechanism fails, the vision performance of the respective person will not improve any further after 10 minutes in the case of darkening from 1 to 0.005 cd/m^2 .
 - II. In the case of darkening from 1 to 0.0001 cd/m^2 , the vision performance of a person with normal eyesight will hardly improve between the 7th and 8th minute.
- (A) Only statement I can be deduced.
 (B) Only statement II can be deduced.
 (C) Both statements can be deduced
 (D) Neither of the two statements can be deduced.

SUBTEST: ANALYZING TEXTS

Working time in the original test for 22 items: 65 minutes

The following items are to test your ability to comprehend the contents of brief texts from the fields of medicine and sciences, and to draw the correct conclusions. For each item, select the correct answer from the proposed solutions (A) to (D) and mark the corresponding letter on the answer sheet.

- 01.** Cushing's syndrome is a disease characterized by an increased concentration of the hormone cortisol in the blood. In a healthy patient, the hormone ACTH, which is produced in the anterior pituitary gland and released into the blood, is transported to the adrenal glands where it causes - via various intermediate steps - the formation of cortisol out of cholesterol. Amongst others, cortisol has an activating effect on the melanocytes that produce the browning pigment of the skin. Cortisol is transported by the blood to the anterior pituitary gland, where it inhibits the production of ACTH.

Which of the following statements on a patient suffering from Cushing's syndrome due to a cortisol-producing tumour in the adrenal glands can be deduced from this information?

- I. The skin of the patient shows comparatively strong pigmentation.
 - II. The blood of the patient shows an increased ACTH concentration.
- (A) Only statement I can be deduced.
 - (B) Only statement II can be deduced.
 - (C) Both statements can be deduced.
 - (D) Neither of the two statements can be deduced.

- 02.** In physiology, "dead space" is that part of the respiratory passages (airways) which does not participate in the gas exchange, i.e. it does not take up oxygen and does not release carbon dioxide. The trachea (air tube) and the nasopharynx (nose and mouth) are part of it. During inhalation, only part of the air reaches the lungs, where the gas exchange occurs. The rest stays in the dead space. During expiration, the air which is in the dead space from the previous breath is exhaled first, before the air from the lungs is exhaled. During inhalation, on the other hand, the air from the dead space reaches the lungs first before fresh air enters the airways. The volume of the dead space comprises approximately 30 percent of the "breathing volume" of a healthy adult. The respiratory volume per minute is the product of "breathing volume" and "respiratory rate".

Which of the following statements can be deduced from this information?

- I. People with a large dead space release – on the average – less carbon dioxide than people with a smaller dead space.
 - II. The oxygen and carbon dioxide content of the air exhaled from the dead space is approximately equal to that of fresh air.
- (A) Only statement I can be deduced.
 - (B) Only statement II can be deduced.
 - (C) Both statements can be deduced.
 - (D) Neither of the two statements can be deduced.
- 03.** The conventional blood group system differentiates between the four blood groups A, B, AB and 0. The surface of the red blood cells (RBCs) of blood group A has antigens of type A; the surface of the RBCs of blood group B has antigens of type B, and the surface of RBCs of blood group AB has antigens of type A and antigens of type B. The surface of RBCs of blood group 0 does not have any antigens. The blood serum of a person contains antibodies against all antigens that are not part of the respective person's RBCs. For example, the serum of humans with blood group B contains antibodies against the A antigen (anti-A serum). Antibodies cause clumping/agglutination of RBCs of the corresponding antigens they are directed against. To determine the blood group, one drop each of the blood to be examined is mixed with anti-A serum, with anti-B serum and with anti-AB serum, respectively.

Which of the following statements on possible test results can be deduced from this information?

- I. When mixing blood of blood group A with anti-B serum, agglutination will occur.
 - II. When mixing blood of blood group 0 with anti-AB serum, agglutination will occur.
- (A) Only statement I can be deduced.
 - (B) Only statement II can be deduced.
 - (C) Both statements can be deduced.
 - (D) Neither of the two statements can be deduced.

SUBTEST: SOLVING QUANTITATIVE PROBLEMS

Working time in the original test for 22 items: 50 minutes

Here you will find some problems which you have to solve.

Example:

A student works in a factory during holidays. He is paid a wage of 10 Euros an hour. He works 8 hours a day and 5 days a week. How much has he earned after four weeks of work?

- (A) 800 Euros
- (B) 1,200 Euros
- (C) 1,600 Euros
- (D) 2,000 Euros

Answer:

- (C) 1,600 Euros

How to reach the solution:

Daily wage = 10 Euros x 8 hours
Weekly wage = Daily wage x 5 days
Wage after 4 weeks = Weekly wage x 4 weeks

Please mark the correct answer (A, B, C or D) on your answer sheet.

- 01.** With a certain pharmaceutical drug, children are only administered a fraction of the adult dose. When multiplying the age of the child by 4 and adding 20, this will result in the daily dose for the child, expressed as a percentage of the daily adult dose.

Let's assume that the daily adult dose is 3 x 2 pills, each with 200 mg of active substance. What is the single dose for a five-year-old child that is supposed to receive four equal administrations per day.

- (A) 60 mg of active substance
- (B) 90 mg of active substance
- (C) 120 mg of active substance
- (D) 180 mg of active substance

- 02.** Julian has agreed to give a talk in three courses. The creation of the three scripts will take different amounts of time. When creating two scripts one after the other without a break, he will need the following time periods: 13 hours for the talks 1 and 2; 17 hours for the talks 2 and 3; and 24 hours for the talks 1 and 3.

How much time will he need for the most time-consuming talk out of the three talks?

- (A) more than 14 hours
- (B) 14 hours
- (C) 13 hours
- (D) less than 13 hours

- 03.** A private hospital is divided into ward A and ward B. Ward A houses 40 % of the hospital beds; it generates 60 % of the total turnover of 120 million Euros and 50 % of the profit of 8 million Euros.

Let us assume that the number of hospital beds in ward B is increased by 20 % of its current number of hospital beds, with the number of beds of ward A being reduced correspondingly; the turnover per bed stays the same in both wards.

Which share in the total turnover applies to ward A after such a change?

- (A) 42.0 %
- (B) 46.7 %
- (C) 48.0 %
- (D) 53.3 %

SUBTEST: IDENTIFYING RULES

Working time in the original test for 22 items: 35 minutes

Each of the following items consists of nine fields. Eight of the fields contain figures. The arrangement of the figures has been carried out according to certain rules. Your task is to identify these rules and apply them in order to find the ninth figure.

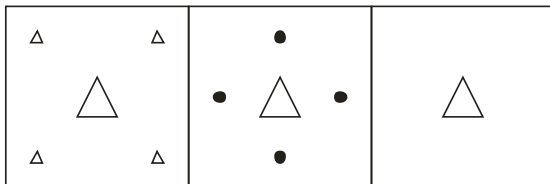
Below the nine fields, you will find eight figures (A, B, C, D, E, F, G and H). Select the figure which should take the place of the question mark.

The rules apply

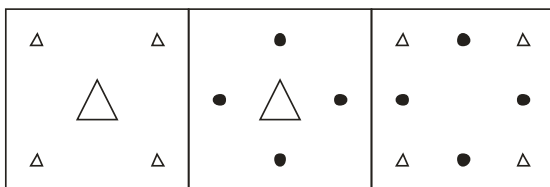
- from left to right (horizontally),
- **OR** from top to bottom (vertically),
- **OR** from left to right **AND** from top to bottom.

There are no other directions (e.g. diagonal) in which the rules can apply!

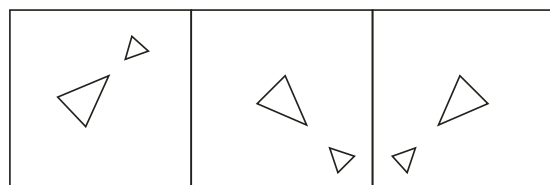
In order to solve an item, you have to identify one, two or three rules. It is also possible that one rule applies horizontally and another rule vertically. In the following you will find some rules that may apply to the item:



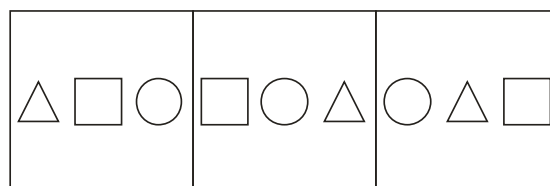
Identical elements remain
Different elements are eliminated



Different elements remain
Identical elements are eliminated

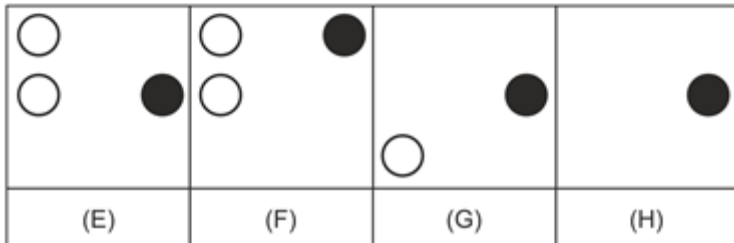
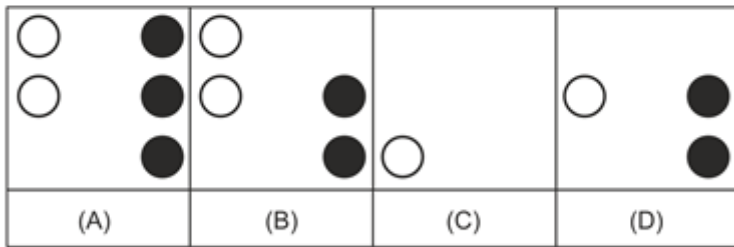
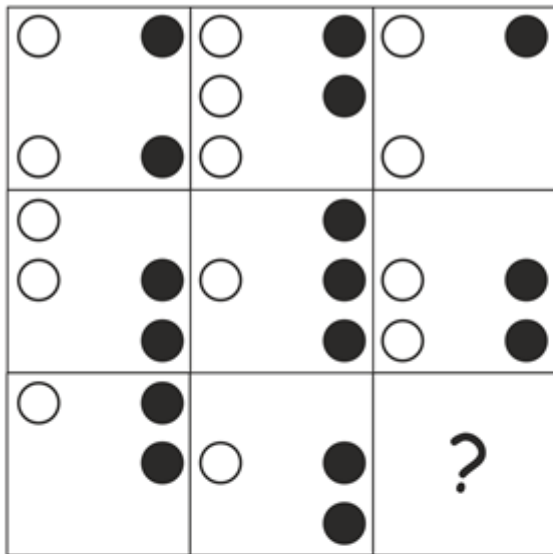


Elements change their position
Elements change their orientation

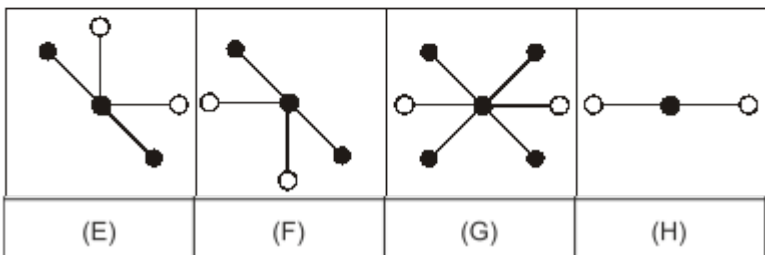
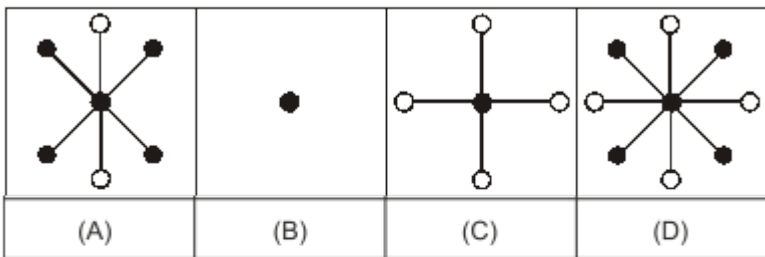
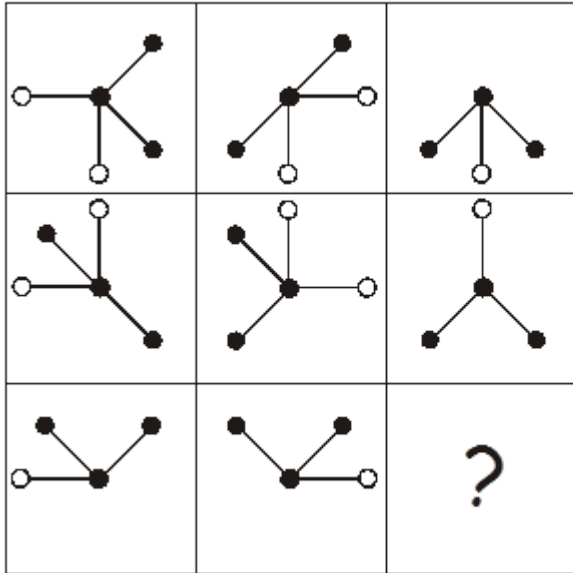


Shapes vary

01.



02.



03.

| | | |
|--|--|--|
| | | |
| | | |
| | | |

| | | | |
|-----|-----|-----|-----|
| | | | |
| (A) | (B) | (C) | (D) |

| | | | |
|-----|-----|-----|-----|
| | | | |
| (E) | (F) | (G) | (H) |

SOLUTIONS AND APPROACHES

SOLUTIONS

| Subtest: Analyzing Graphs and Tables | | |
|---|---------------|---------------|
| Item 1 | Item 2 | Item 3 |
| B | A | C |

| Subtest: Analyzing Texts | | |
|---------------------------------|---------------|---------------|
| Item 1 | Item 2 | Item 3 |
| A | B | D |

| Subtest: Solving Quantitative Problems | | |
|---|---------------|---------------|
| Item 1 | Item 2 | Item 3 |
| C | B | B |

| Subtest: Identifying Rules | | |
|-----------------------------------|---------------|---------------|
| Item 1 | Item 2 | Item 3 |
| G | B | H |

APPROACH TO THE “ANALYZING GRAPHS AND TABLES” SUBTEST

Item 1

Level of difficulty: low

Explanation:

Statement I can easily be disproved. When the initial temperature is 30 °C, a decrease in the skin temperature by less than 0.2 °C already leads to the perception “getting colder”, and thus to a perceived change in temperature.

Statement II, on the other hand, can be deduced: When the initial temperature is 32 °C, an increase in skin temperature by 0.5 °C is slightly above the threshold to the perception “getting warm”.

The correct solution to this item is therefore **(B)**.

Item 2

Level of difficulty: medium

Explanation:

The **first statement** can be deduced. It is a statement about two values which can both be taken directly from the graph: the number of persons who fell ill on November 15, and the number of cases reported to the health authorities on November 15. With regard to the first number, the graph shows clearly that on November 15 the curve is above the value 25. With regard to the second number, the graph also shows clearly that the respective curve is below the value 4 on November 15.

Statement II also seems, at first glance, to be a simple comparison of two values: the number of persons who fell ill on October 16 and the number of persons who were admitted to hospital on October 16. If we take a closer look, however, it becomes clear that the statement is not about the persons who were hospitalised exactly on October 16, but about those who fell ill on October 16 and were later admitted to hospital (either on the same day or – probably more frequently – on one of the following days). The fact that the apexes of the two curves showing “Cases” and “Hospitalisations” differ by about 14 days shows that in most cases several days passed between the time the person fell ill and the time he was admitted to hospital. Even if we do not consider that fact, it is clear that the number of persons hospitalised on October 16 does not by any means necessarily have to be a subset of the persons who fell ill on that day. Therefore statement II cannot be deduced.

The correct solution to this item is therefore **(A)**.

Item 3

Level of difficulty: high

Explanation:

The correct solution to this item is **(C)**; in other words, both statements can be deduced from the information given in the text and the graph.

Statement I describes the situation in which the rod mechanism fails. According to the text, the dashed line of the "cone curve" shows how the vision performance develops under changing light conditions when the rod mechanism fails. Therefore we must look at the "cone curve". Between a luminance of 1 cd/m^2 and a luminance of just under 0.01 cd/m^2 (10^{-2}), the "cone curve" drops – very rapidly at first and then more and more gradually. From then on, however (after about 10 minutes of adaptation time and clearly above the luminance of 0.005 cd/m^2 referred to in the statement), it runs parallel to the x-axis. This means that, no matter how long the adaptation time is, the vision performance no longer improves.

The **second statement** is about the transition from "cone" to "rod" vision. Since here we are talking about a person with normal eyesight, we need only to look at the continuous black curves when we think about whether or not the statement is correct. And in fact the continuous section of the "cone curve" drops very rapidly at first, but then – from the fourth minute onwards – more and more gradually, and between the seventh and eighth minute it merges almost asymptotically with the x-axis. Only then (when "rod vision" sets in), does the curve once again drop rapidly. That means that in the time period mentioned in statement II ("between the 7th and 8th minute") there is no considerable improvement in vision performance. (As the luminance decreases, the vision performance can be said to "stagnate" in a sense.)

APPROACH TO THE "ANALYZING TEXTS" SUBTEST

Item 1

Level of difficulty: low

Explanation:

Statement I can be deduced from the text: the concentration of cortisol in the patient's blood is increased due to a cortisol-producing tumour. As a result, the melanocytes – which produce the browning pigment of the skin – are activated to an increased level of production. The patient's skin therefore shows comparatively strong pigmentation.

Statement II cannot be deduced from the text: the increased cortisol concentration in the patient's blood inhibits the production of ACTH. As a result, the ACTH concentration in the blood is decreased and not increased.

The correct solution to this item is therefore **(A)**.

Item 2

Level of difficulty: medium

Explanation:

Statement I cannot be deduced from the text: the amount of carbon dioxide released during expiration is unrelated to the size of the dead space because the dead space does not participate in the gas exchange.

Statement II can be deduced from the text: according to the text, when a person exhales, the air which is in the dead space from the previous inhalation is exhaled first. Since no exchange of gas takes place in the dead space, this air is similar in content to the fresh air inhaled previously.

The correct solution to this item is therefore **(B)**.

Item 3

Level of difficulty: high

Explanation:

To understand this item, it may help to make a sketch of the circumstances described. Such a sketch, for example, could look like this:

| Blood group | A | B | AB | 0 |
|---------------------|-----------|-----------|-------------------|-------------------------|
| Antigens on RBCs | type A | type B | type A and type B | - |
| Antibodies in serum | against B | against A | - | against A and against B |

You can now read the solutions directly from this sketch:

Statement I cannot be deduced from the text: the red blood cells of blood group A have only antigens of type A on their surfaces. If this blood is mixed with anti-B serum, which contains antibodies against antigens of type B, no agglutination will occur. Statement I is therefore not correct.

Statement II can also not be deduced from the text: the red blood cells of blood group 0 have no antigens on their surfaces. If this blood is mixed with anti-AB serum, which contains antibodies of antigens of type A and type B, no agglutination will occur.

The correct solution to this item is therefore **(D)**.

APPROACH TO THE "SOLVING QUANTITATIVE PROBLEMS" SUBTEST

Item 1

Level of difficulty: low to medium

Explanation:

If we multiply the child's age (5 years) by 4 and then add 20, the resulting value is 40. The daily dose for the child is therefore 40 % of the daily dose for an adult.

The daily dose for an adult is 1,200 mg of active substance ($3 \times 2 \times 200$ mg). For the five-year-old child, the daily dose is therefore 480 mg of active substance (40 per cent of 1,200 mg). If we divide the daily dose of 480 mg by four to receive four equal administrations, we arrive at a single dose of 120 mg of active substance.

The correct solution to this item is therefore **(C)**.

Item 2

Level of difficulty: medium to high

Explanation:

If we name the times for the creation of the three scripts T1, T2 and T3, we have the following three equations:

$$T1 + T2 = 13 \text{ hours}$$

$$T2 + T3 = 17 \text{ hours}$$

$$T1 + T3 = 24 \text{ hours}$$

It is already clear from these equations that the script for talk 3 is the one that will be the most time-consuming to create. Therefore we will begin by solving the first equation for T1 ($T1 = 13 - T2$) and the second equation for T2 ($T2 = 17 - T3$).

If we enter these two equations into the third equation ($T1 + T3 = 24$ hours), the result is $13 - (17 - T3) + T3 = 24$ hours.

If we solve this equation for T3, we come to the conclusion that it will take 14 hours to create the script for talk 3. The correct solution to this item is therefore **(B)**.

Item 3

Level of difficulty: high

Explanation:

If the number of hospital beds in ward B is increased by 20 %, this number rises from 60 % to 72 % of the total number of beds. In ward A, the percentage share accordingly decreases from 40 % to 28 % of the total number of beds.

The turnover of ward B therefore rises from 40 % to 48 % of the previous total turnover and the turnover of ward A decreases from 60 % to 42 % of the previous total turnover ($28 \% : 40 \% = x : 60 \% \square x = 42 \%$).

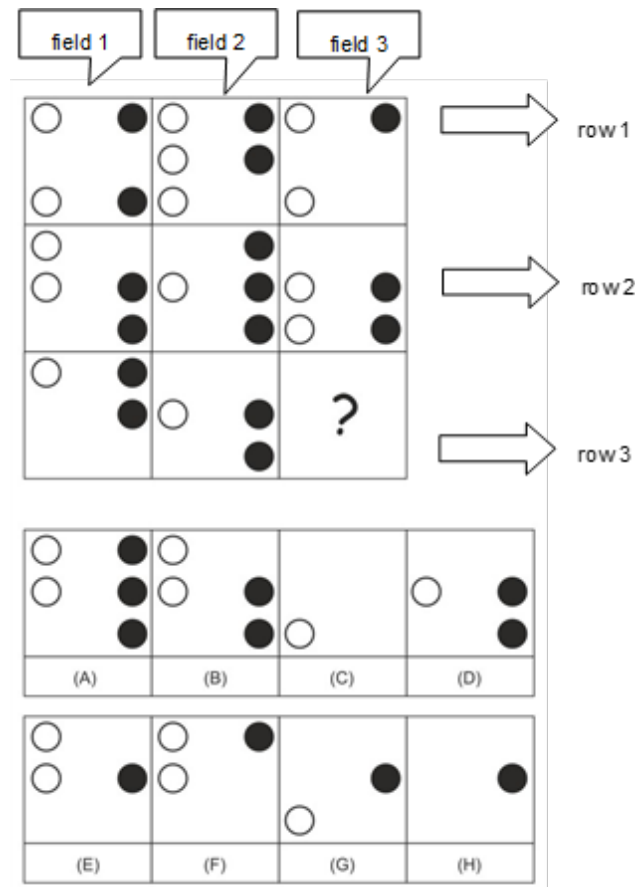
After the change, the total turnover amounts to only 90 % of the total turnover before the change (48% + 42%). After the change, ward A therefore accounts for 46.7 % of the total turnover (42 % of 90 %).

The correct solution to this item is therefore **(B)**.

APPROACH TO THE "IDENTIFYING RULES" SUBTEST

Item 1:

Level of difficulty: low



Two different rules apply:

The white circles: Please look at the first column. In all three rows, there is a white circle in the upper left corner. The other white circles seen in field 1 of the rows 1 and 2 do not turn up again in field 1 of row 3. In column 2 the same applies: in all rows there is a white circle at medium height on the left. The other white circles in field 2 of row 1 are not seen in row 2 and row 3. The rule that can be deduced for the white circles is: identical elements remain. This rule applies vertically.

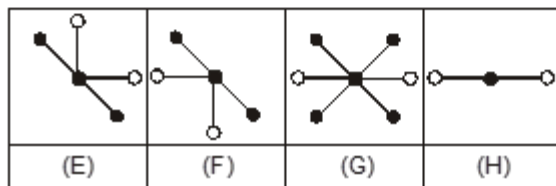
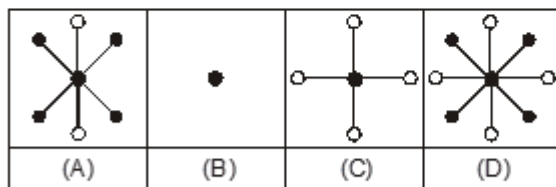
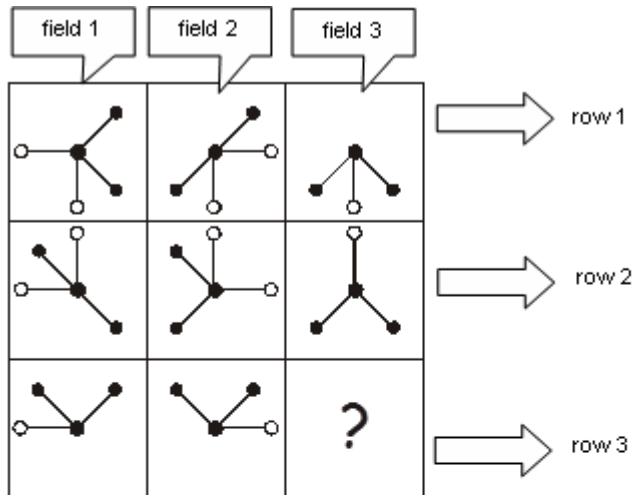
The black circles: Look at row 1. In all three fields, there is a black circle in the upper right corner. The other black circles in field 1 and field 2 of row 1 do not turn up again in field 3 of row 1. In row 2, the same two black circles can be seen in all three fields; an additional black circle is seen only in field 2 of row 2. The rule that can be deduced for the black circles is: identical elements remain. This rule applies horizontally.

In field 3, row 1 and row 2 both have a white circle in the lower left corner. In row 3, field 1 and field 2 both have a black circle at medium height on the right. These two circles together make up the solution.

Therefore the solution is **(G)**.

Item 2:

Level of difficulty: medium



Two different rules apply:

The lines with the coloured-in circles: A line appears in field 3 if it is not in the same position in field 1 and field 2. Please look at row 1. The line with the circle at the top right appears in field 1 and field 2. It does not appear in field 3. The line with the circle at the bottom right appears only in field 1, and the line with the circle at the bottom left appears only in field 2. In field 3 is a line with a circle at the bottom left and a line with a circle at the bottom right. Identical lines cancel each other out!

The lines with the blank circles: A line appears in field 3 if it is in the same position in field 1 and field 2. Please look at row 1. In field 1 there is a line with a circle at the left. In field 2 there is a line with a circle at the right. In both fields there is a line with a circle at the bottom. In field 3, only the line with the circle at the bottom appears. Differing lines cancel each other out!

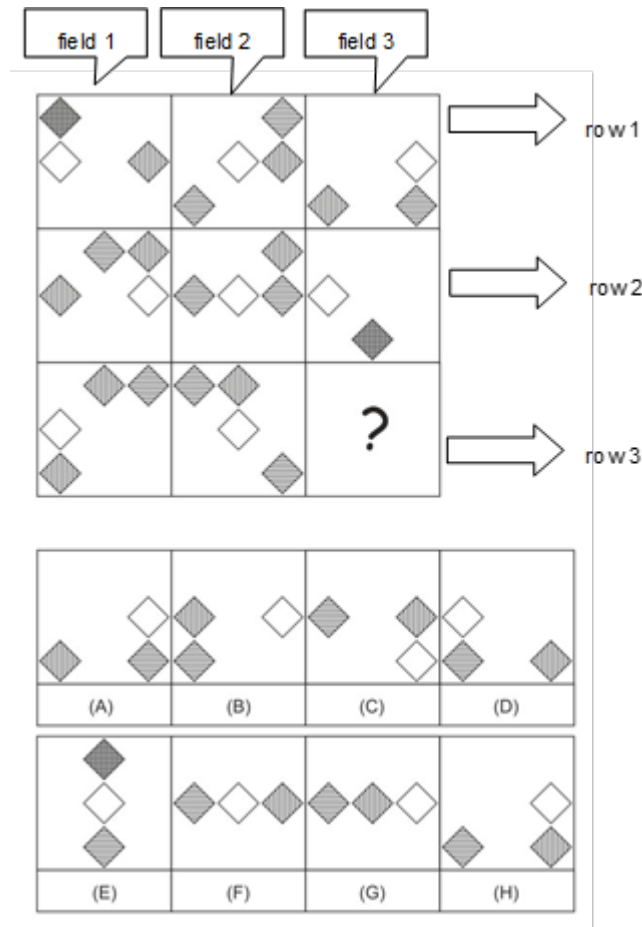
In field 1 and field 2 of row 3, both lines with coloured-in circles are in the same position, so they cancel each other out. In field 3 there is accordingly no line with a coloured-in circle. The lines with blank circles are not in the same position in field 1 and field 2 so – as differing lines – they also cancel each other out.

This means: No lines with coloured-in circles, and no lines with blank circles.

Therefore the solution is **(B)**.

Item 3

Level of difficulty: high



Three different rules apply:

The white diamonds: Look at row 1. In all three fields there is a white diamond at medium height. In field 1, the diamond is on the left, in field 2 it is at the centre, and in field 3 it is on the right. In row 2, the white diamonds are also at medium height and distributed over three positions: in field 1 the diamond is on the right, in field 2 it is at the centre, and in field 3 it is on the left. The rule that can be deduced for the white diamonds is: the diamonds appear at medium height and are positioned once at the centre, once at the left and once at the right. This rule applies horizontally.

The horizontally striped diamonds: Look at column 1. In the first field, we see a horizontally and a vertically striped diamond on top of one another, i.e. in the same position, in the upper left corner. In field 1 of row 2, the horizontally striped diamond has moved one position to the right. In field 1 of row 3, the horizontally striped diamond has moved one more position to the right, and is now in the upper right corner. The rule that can be deduced for the horizontally striped diamonds is: the diamonds move to the next position in clockwise direction. This rule applies vertically. The rule is confirmed in the second column.

The vertically striped diamonds: Look at column 1. In the first field, we see a horizontally and a vertically striped diamond on top of one another, i.e. in the same position, in the upper left corner. In field 1 of row 2, the vertically striped diamond has moved down one position. In field 3 of column 1, this diamond has moved down again, and is now at the bottom left. In the first field of row 1, a second vertically striped diamond is seen at medium height on the right. In field 1 of row 2, this diamond is in the upper right corner, and in field 1 of row 3 it is at the top centre. This is exactly the pattern followed by the vertically striped diamond in the three rows of column 2. The rule that can be deduced for the vertically striped diamonds is: the diamonds move to the next position in a counter-clockwise direction. This rule applies vertically. In fields 1 and 2 of row 3, the white diamond is seen at the left and at the centre. So in the missing field, there has to be a white diamond at the right centre. In field 3 of row 2, the horizontally and vertically striped diamonds are seen on top of one another at the bottom centre. Therefore, the missing field has to have a horizontally striped diamond in the lower left corner and a vertically striped diamond in the lower right corner.

Therefore the solution is **(H)**.