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TITLE IEA Six-Subject Survey Instruments: Reading Comprehension Tests.

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IDENTIFIERS *International Evaluation Educational Achievement

ABSTRACT

In 1965 the International Association for the Evaluation of Educational Achievement (IEA) inaugurated a cross-national survey of achievement in six subjects: Science, Reading Comprehension, Literature, English as a Foreign Language, French as a Foreign Language, and Civic Education. The overall aim of the project was to use international tests in order to relate student achievement and attitudes to instructional, social, and economic factors, and from the results to establish generalizations of value to policy makers worldwide. Contained here are six tests measuring Reading Comprehension (populations I, II, IV); and one test measuring reading speed (populations I, II). Population I consists of students aged 10 to 11 years; population II, 14 to 15 years; and population IV, students enrolled in the final year of pre-university training. Some answer keys and statistical data can be found in ED 084 503.
(RC)

The basic procedures to be followed in the main testing of the IEA Six-Subject Survey were set out in a series of manuals:

- Stage 2 IEA/M1 Manual for National Centers
 IEA/M2 Manual for School Coordinators
 IEA/M3 Manual for Test Administrators
- Stage 3 IEA/M1/Stage 3 Manual for National Centers
 IEA/M2/Stage 3 Manual for School Coordinators
 IEA/M3/Stage 3 Manual for Test Administrators

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4-5: Instrument Within Type

One or two characters used when necessary to uniquely identify each instrument when there is more than one instrument of the same type.

Instrument Name Reading Comprehension Test - Section C

Data Bank Instrument Number E1RC

Page 1, p. 107

"From your large envelope take out Section A. From the small envelope take out the pit answer card marked A. Be careful not to bend the answer card. Put the small envelope inside the large envelope and place it at the top of your answer card."

A check of the answers to see that all students have ready to hand a number 1.

Then say:-

"You are now going to do some tests to see how well you understand what you read. You should mark the spaces on your answer card in the same way as you did for the Science tests. Now look at the front of back of your answer card and read the instructions. This test is made up of four stories with a number of questions on each. Read the first story and then answer the questions on each. Then go on to the second story and so on until you come to the end of Section C. Each question has four possible answers. Pick the right answer or number and tick it on the oval on the answer card which has the same letter as the answer you have chosen. You may read the story over until you are sure you need to. Try each question in turn. If you don't know the answer, leave it and go on to the next question. You may come back to it later if you have time. Please answer even if you aren't quite sure. However, do not guess blindly. When you finish one story go on to the next. Continue until you reach the end of Section C. If there is time left, go back and try to do any that you omitted."

Then say:-

"Remember the answers to Section C are to be marked on your answer card in the section marked C."

In the event of a possible question on the answer card.

Then say:-

"You will now be allowed for this test. Now turn over the page and begin." Note: as a result of this test some students are continuing with part of the stories within the section and not stopping for the time being.

BOOKLET 3Reading ComprehensionDirections

This is a test to see how well you understand what you read. The test is made up of four stories with a number of questions on each. Read the first story and then answer the questions on each. Then go on to the second story and so on until you come to the end of Section C.

Each question has four possible answers. Pick the best ending or answer and blacken the oval on the answer card which has the same letter as the answer you have chosen.

You may read the story over again as much as you need to. Try each question in turn. If you don't know the answer, leave it and go on to the next question. You may come back to it later if you have time.

Please answer even if you aren't quite sure. However, do not guess blindly.

When you finish one story go on to the next. Continue until you reach the end of Section C. If there is time left, go back and try to do any that you omitted.

SECTION C

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One of the most interesting birds I have seen is the Indian Tailor Bird. It is a small olive green bird that doesn't look at all unusual, yet it has a most unusual way of making its nest. The birds work together in pairs. First they find a leaf, the right size, and make holes along the edges with their beaks. Through these holes they thread grass. One bird pushes the thread from the outside, while the other bird sits in the nest and pushes it back until the edges of the leaf are sewn together to make a kind of bag, still hanging on the tree, in which the Tailor Bird lays its eggs.

1. What does the Tailor Bird use in place of thread?
 - A. Grass.
 - B. String.
 - C. Spider web.
 - D. Thorns.

2. The Tailor Birds are interesting because they
 - A. are small and olive green in colour.
 - B. live in pairs.
 - C. make their nests in a special way.
 - D. fly very fast.

3. The Tailor Bird got that name because it
 - A. is a small bird.
 - B. looks unusual.
 - C. can sew.
 - D. has a beak shaped like a needle.

4. The Tailor Birds make their nests
 - A. from leaves.
 - B. in a hole in a tree.
 - C. in the tall grass.
 - D. with a lining of grass.

5. The person who wrote about Tailor Birds was trying to
 - A. give you some new information.
 - B. tell you a story.
 - C. get you to share his feelings.
 - D. keep you guessing on how the story will come out.

Please continue

Once I watched a mother seal with twin babies for an hour or two and could have spent hours more observing them if time had permitted. Sometimes the two little animated balls of down would snuggle side by side and suckle together while their mother dozed. Then the little imps would play pranks on her, brushing and tickling her face with their flippers and nipping at her head and neck as they frisked and teased around her. She dozed with one eye held open, always keeping a watchful glance upon her offspring and now and again she would lift her head to regard them and to give a deep bay, which I could only interpret as an expression of unalloyed contentment with her happy lot.

Like a cow licking her calf, occasionally she would caress her babies, snuffling and nibbling, for seals are short-tongued creatures.

6. The mother kept watch over her babies while she rested by
 - A. lifting her head to watch them.
 - B. dozing with one eye open.
 - C. caressing them fondly.
 - D. suckling them.

7. The writer calls the baby seals "imps" because they
 - A. did not like to stay still.
 - B. liked to tease their mother.
 - C. snuggled side by side.
 - D. were sma'l.

8. The writer lets us know it is hard for the mother to lick the baby seals because
 - A. they will not keep still.
 - B. she has a short tongue.
 - C. she goes to sleep.
 - D. they tickle her face.

9. The writer thought that watching the seals was very
 - A. exciting.
 - B. useful.
 - C. difficult.
 - D. interesting.

10. The writer talks about the baby seals and their mother as if
 - A. he had never actually seen them.
 - B. they were lifeless.
 - C. they were human.
 - D. they were troublemakers.

Please turn over and continue.

Robert, standing in the stern, was confidently poling the punt over the waters of the narrow river that sunny afternoon, while Joan sat on the cushions facing him, trailing her hands in the cool water. Robert was proud of his skill, and was poling along with quite a flourish. The punt approached the lowest bridge on the river, where Robert knew he must bend low to avoid the arch. Alas! Though he bowed low, the pole stood upright, wedging itself in the mud of the river bed and against the arch of the bridge.

There was a brief struggle while Robert tried to decide whether to leave the pole and stay on the punt or accept the alternative. But the punt wouldn't wait for decisions and Robert was left clinging to the pole. Further and further into the mud the pole sank, while he climbed higher and higher to keep out of the water. Just when it seemed to the amused watchers that he must at last fall in, he was saved. Joan managed to paddle the punt back to his rescue.

11. When the pole started to sink into the mud, Robert
 - A. began to get wet.
 - B. called to Joan for help.
 - C. climbed up the pole.
 - D. climbed onto the bridge.

12. The punt had two things to make it go. These were a
 - A. pole and a paddle.
 - B. pole and a pair of oars.
 - C. pole and a motor.
 - D. paddle and a pair of oars.

13. When Robert has to "accept the alternative", the alternative was to
 - A. jump into the river.
 - B. stay in the boat.
 - C. have Joan save him.
 - D. hang onto the pole.

14. How did Joan feel about Robert's mishap?
 - A. we cannot tell.
 - B. she was amused.
 - C. she was embarrassed.
 - D. she was angry.

15. The pole was held upright at the bridge by
 - A. only the mud on the river bottom.
 - B. only the arch of the bridge.
 - C. both the mud and the bridge.
 - D. Robert holding onto it.

16. We know that the river was not very deep, because
 - A. Robert pushed the punt with a pole.
 - B. punts do not need much water.
 - C. the bridge was very low.
 - D. the bottom was muddy.

For three or four thousand years a family of marmots had been settled in a grassy little valley under the cliffs of a jagged peak whose present name is the Rock of Wonders. The maps specify that the peak is about seven thousand two hundred feet in altitude.

The spot was a remarkably suitable one for all sorts of good reasons. In the first place, the slope faced south. The sun shone on it from dawn until dark, and in the spring the snow melted there faster than anywhere else. One could warm oneself as much as one wished, or again one could sit in the shade of huge rocks fallen from the heights of the mountain. A little way off a tiny spring fed a little lake. Thanks to this fresh spring, which never dried up, the grasses round about grew thick and strong, even in the month of August.

The rocks provided many sitting places and perfectly safe holes where one could take refuge in an emergency. As for the Family Cave, hollowed out many years ago by the grandfather of the present inhabitant, it opened out pleasantly from under a flat slab between two clumps of arnica. Since it had already been improved by two generations, it would have been difficult to find a drier and more comfortable apartment.

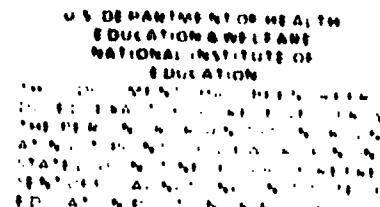
17. Why had the marmots lived so long in one place?
- A. They did not like to travel.
 - B. They could not climb down the cliffs.
 - C. They came there long ago.
 - D. It was a very good place.
18. What kept the grasses in the valley green and healthy all summer?
- A. The warm sun.
 - B. The melting snow.
 - C. The high peak.
 - D. A spring.
19. Why was it a good thing that the valley faced to the south?
- A. The summer days were warmer.
 - B. Winter snows melted early.
 - C. The best view was to the south.
 - D. Marmots need a lot of sun.
20. From the story we know that marmots like to live in a home that is
- A. warm.
 - B. light.
 - C. dry.
 - D. large.
21. The last sentence of the story makes us think that the marmots will
- A. make many new homes.
 - B. continue to live in the Family Cave.
 - C. have many babies.
 - D. work hard to make the cave comfortable.

END OF SECTION C

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Instrument Name Reading Comprehension Test - Section D

Data Bank Instrument Number E1RD

"We are now ready to start Section D. The answers to Section D are to be made on your answer card in the Section marked D."

Indicate the appropriate section of the answer card.

Then say:-

"The questions in Section D are like those you have just completed.

see instrument number ELRC for information about the instructions given for the test just prior to this one You will have 25 minutes for this section. Now turn over the page and begin.

SECTION D

BEST COPY AVAILABLE

The sundew is a small, pretty plant, that grows in damp, boggy places. Its leaves grow in clusters on slender reddish stems. On each leaf there are several beautiful shining drops that look like the smallest dewdrops you can imagine. A passing insect sees the drops and thinks they are drops of sweet nectar. He lights on the sundew's leaves. Surprise! The sticky drop is not nectar. It is the glue that the sundew uses to attract insects. The small leaves close over the insect. Soon the insect disappears, for the sundew is one of the strange plants that eat living insects.

1. Insects are most attracted to the sundew when they want to
 - A. play.
 - B. hide.
 - C. rest.
 - D. eat.

2. An insect lighting on a sundew disappears in the
 - A. sunlight.
 - B. sky.
 - C. plant.
 - D. bog.

3. When an insect that has lighted on a sundew disappears, it has
 - A. been eaten.
 - B. flown away.
 - C. gone to sleep.
 - D. fallen to the ground.

4. You would expect to find the sundew growing in places where it was
 - A. cold.
 - B. wet.
 - C. high.
 - D. grassy.

5. The sundew's leaves are
 - A. slender.
 - B. shining.
 - C. in clusters.
 - D. covered with dew.

Please continue

Ernenek slipped out of his sleeping bag. On top of his clothes made of small auk's skins, with the feathers inside, he put on other clothes made of bear skin, with the fur on the outside and pushed the trouser legs into his sealskin boots.

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He came out of the narrow tunnel of the igloo on all-fours, pulling the half-asleep dog, who was the leader of the team, by its leash, while the other dogs followed yawning and shaking the rime off their thick fur. They clamoured for food by barking and showing their teeth which had been filed with stones so that they could not gnaw their bridles; they looked more like wolves than dogs with their pointed muzzles and their yellow, glowing eyes.

Ernenek iced the sledge runners, then he harnessed the dogs, unfastened the sledge anchor and climbed on to the sledge. Under the whip, the dogs formed out behind the leading dog, pulling on the traces which attached them separately to the sledge and yelping behind the white clouds of vapour coming out of their mouths.

It was hot; the temperature must have been about 17 degrees below zero and Ernenek did not have to run behind the sledge to warm himself; he could remain sitting and enjoy the drive.

The icy ocean on which he travelled, frozen to a depth which exceeded a man's height and superficially covered with snow, bore the clear trace of the sledge of his friend who had started before him.

Ernenek did not turn to look at the solitary igloo he was leaving behind, a minute cute hump of ice at the top of the world.

6. Ernenek's dogs resembled wolves because they had
 - A. a very sharp sense of smell.
 - B. filed teeth and a small muzzle.
 - C. great strength to pull the sledge.
 - D. pointed muzzles and glowing eyes.
7. We can tell from the passage that auks are
 - A. animals like bears.
 - B. related to seals.
 - C. dogs that pull sledges.
 - D. birds.
8. The dogs' teeth had been filed with stones to make them
 - A. sharp.
 - B. clean.
 - C. smooth.
 - D. blunt.
9. Why did Ernenek ice the runners of his sledge?
 - A. to cool them off.
 - B. to make them slippery.
 - C. so he could harness the dogs.
 - D. to remove the dirt.

Please turn over and continue

BEST COPY AVAILABLE

10. In describing the dogs, the writer tries to make them seem
- A. brave.
 - B. strong.
 - C. well-trained.
 - D. savage.
11. In saying that Ernenek's igloo was "at the top of the world", the writer means that it was
- A. on the icy ocean.
 - B. near the North Pole.
 - C. far from any other home.
 - D. very small and unimportant.
12. We can tell from the fourth paragraph that
- A. It was a really hot day.
 - B. Ernenek hated to run.
 - C. Ernenek got cold easily.
 - D. Ernenek was used to very cold weather.

Please continue

Simonides was a poet. He wandered round the wealthy cities of Asia, composing poems and singing the praises of warriors for such reward as he could gain. By this means he gathered a considerable amount of wealth, and after some years he made up his mind to return by sea to his native island of Ceos. While he was on the ship, a dreadful storm arose, and all the passengers began in panic to gather together their precious belongings.

Simonides stood on the deck calmly, making no effort to gather up his own baggage. Some of the other passengers were amazed at this, and one of them asked Simonides why he was not trying to save any of his property. "All my real wealth", said Simonides, "is in my head". The others laughed at the foolish poet, and as the ship foundered they leapt into the sea weighed down with all their possessions. Some of them attempted to carry such heavy burdens that they drowned. Others managed to struggle ashore. But here they were set upon by thieves, who stripped them naked of all that they owned.

Simonides, meanwhile, made his way to the nearest town, without being robbed, since he had nothing for the thieves to take. No sooner was he in the streets than he was recognized by a lover of his poetry, and showered with clothes, gifts and hospitality.

Next day, as he was walking with some of his new friends and admirers, Simonides happened to see some of his fellow travellers, who were begging for food and shelter. As soon as he saw them, Simonides said, "You see, you laughed at me on the ship when I said that my real wealth was in my head. But now you are beggars while I am well clothed and on my way to being prosperous again; now I can help you. What you have tried to save is all lost. But I carried my riches along with me - my poems".

13. Simonides had made his living by composing poems that told of
- A. the beauty of nature.
 - B. life on the sea.
 - C. life in ancient times.
 - D. the great deeds of warriors.
14. The other passengers laughed at Simonides because he
- A. had no baggage.
 - B. did not try to save his possessions.
 - C. was so frightened of the storm.
 - D. read poems during the storm.
15. The thieves did not rob Simonides because he
- A. was recognized by them.
 - B. had no possessions.
 - C. made poems for them.
 - D. was able to escape them.

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16. What suggests that Simonides' poems were not written down?
- A. He said his real wealth was in his head.
 - B. He did not try to gather his belongings.
 - C. They had to do with the deeds of warriors.
 - D. No one recognized his poetry.
17. When Simonides said "my real wealth is in my head", he meant
- A. by his knowledge he could earn new wealth.
 - B. beauty is more important than mere possessions.
 - C. he had very little that he owned.
 - D. he was a very intelligent man.
18. The idea that the writer of this story is trying to get over to us is that
- A. possessions are of no value.
 - B. life is dangerous and uncertain.
 - C. poetry may be wealth.
 - D. poetry is beautiful
19. In this story, the author's main purpose is to
- A. entertain his reader.
 - B. write very beautifully.
 - C. weave a lesson into the story.
 - D. give some useful information.

Please continue

Before the advent of hunters with guns, the musk ox was king of the tundra. His heavy coat protected him against the cold of winter and the swarms of bloodsucking insects in summer. With his heavy hooves he could break the ice crusts that covered the willow branches he was so fond of. When danger threatened, the bulls lined up before the cows and their young. With their strong, sharp horns they were more than a match for wolves or hunters with primitive weapons. But when they lowered their heads and charged they made an easy target for a huntsman with a gun. And so now there are only about seven thousand musk oxen.

20. The word "advent" in line 1 most nearly means
- A. sport.
 - B. attack.
 - C. ending.
 - D. arrival.
21. If a hunter went to hunt the musk ox in summer, the worst trouble he would face would be
- A. wolves.
 - B. insects.
 - C. the charge of the bulls.
 - D. a chance of frost-bite.
22. The last sentences suggest that
- A. the musk oxen are dying off.
 - B. the musk ox is a stupid animal.
 - C. the musk ox cannot survive in today's world.
 - D. hunters are killing too many musk oxen.
23. The musk ox lives in the
- A. far North.
 - B. desert.
 - C. jungle.
 - D. mountains.
24. The writer's feelings about the musk ox can best be described as
- A. fear of such a powerful animal.
 - B. eagerness to go and hunt one.
 - C. interest in their care for their young.
 - D. concern that they may all be killed.

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Instrument Name Reading Speed Practice Test, Section P and Reading Speed Test

Data Bank Instrument Number E5RP and E5RJ

Note: Both the practice and the actual tests are included

Note that E5RP is a practice test only, so no data were collected from this instrument. The actual test from which the data resulted (E5RJ) will be found immediately following E5RP.

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IEA/M3

Pop I, p. 10-11

For this test, the test administrator will need an accurate stop watch.

"Now we are going to have a test to see how quickly you can read. First we shall have a practice test. Turn to Section P of your booklet. Follow the directions while I read them. Here is a story. The story has many little parts. When you come to the end of a part, there will be three words like this: One two three."

Here write on the blackboard:

one two three

Say:

"Put a line under the word that fits in the story. For this test you underline the words in the booklet. Read as fast as you can, and see how many parts of the story you can read and work in the time that you have. Remember, read as fast as you can, but be sure to mark the right word after each part of the story."

Then say:-

"Are there any questions?"

Answer any questions. Try to be sure that all students understand how they are to mark their answers. Then say:-

"Turn over the page and begin."

At the end of 4 minutes say:-

"Stop working and put your pencil down."

They say:-

"This has been a practice test only. Are there any questions on how you are to do this test?"

IEA/M3

Pop II, p. 12-13

"Now we are going to have a test to see how quickly you can read. First we shall have a practice test. Turn to Section P in Test Booklet 7. Follow as I read the directions.

Here is a story. The story has many little parts. When you come to the

end of a part there will be three words, like this:

one two three

"Put a line under the word that fits in the story. For this test you underline the word in the booklet. Read as fast as you can, and see how many parts of the story you can read and mark in the time that you have. Remember, read as fast as you can, but be sure to mark the right word after each part of the story. Are there any questions?"

Answer any question. Try to be sure that all students understand how they are to mark their answers. Then say:-

"Turn over the page and begin."

At the end of exactly four minutes, say:-

"Stop working and put your pencils down."

Then say:-

"This has been a practice test only. Do you understand how to do this test?"

SECTION F

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READING SPEEDPRACTICE TESTDirections

Here is a story. The story has many little parts. When you come to the end of a part there will be three words like this:

one

two

three

Put a line under the word that fits in the story. For this test you underline the words in the booklet.

Read as fast as you can, and see how many parts of the story you can read and mark in the time that you have.

Remember - read as fast as you can, but be sure to mark the right word after each part of the story.

Do not use an eraser. If you change your mind, cross out your first answer and then put a line under your second choice.

1. Yesterday we went to the airport. While we were there a big plane came in. On each side of it there were a great many
- eggs windows wings
2. We saw the people get out of the plane. Some of them had bags in their hands. The bags had been in the
- airport people plane
3. We went to meet my Aunt Jane. She was coming to spend two weeks with us. We shall see Aunt Jane for two
- days weeks months
4. Aunt Jane has three children. The oldest is a boy and the other two are girls. The name of Aunt Jane's oldest child is
- Alice Mary Roger
5. Next week Roger will come to visit us too. He will stay and go home with my Aunt Jane. He will go home with his
- brother mother sister
6. Roger is two years older than my brother John. John was ten years old last month. Roger's age is now
- eight ten twelve
7. While Roger is here we will go to the zoo. We will see the lions and the bears. These are what we like best in the
- house store zoo
8. Mother will make a big cake for Roger. He likes chocolate cake very much, and so the cake my mother makes will be
- fresh little chocolate
9. Roger will sleep in the same room with my brother John. There are two beds in the room. Each boy will have his own
- bed dog room

BEST COPY AVAILABLE

10. Roger likes to ride in the car. There are many nice drives near the city where I live. We will take Roger for a long
ride walk while
11. Next summer I hope to visit Roger. I will ride to his city on the railroad. I will go to visit Roger in a
car plane train
12. Roger lives near a large lake. We like to swim in the lake when it is warm. We only swim there in the
night summer winter
13. There are many boats on the lake. Some of them have sails, and some of them have motors. All of them are on the
lake land shore
14. The sailboats need some wind in order to go. Boats with a motor need no wind at all. A motorboat is the best kind on a day that is
calm dry windy
15. The white sails of the sailboats are very pretty. The wind on the sails makes them tip. On a windy day the boats on the lake are very
dry empty pretty
16. On my train trip I will pass many farms. There are some cows on these farms. From the train I shall probably see some of these
cows sheep trees
17. Some of the cows are black and white, and some are brown and white. The brown and white cows give the richest milk. Milk from the other cows is not so
clean much rich
18. The train will make four stops on the way to Roger's city. I do not get off at any of them. The stop that I get off at is the
first second fifth

BEST COPY AVAILABLE

19. The first stop is at the town of Bellport. Here there is a factory where shoes are made. Shoes are the main product in this

country town village

20. After that we come to Pennsville. We stop there for only two minutes, and there is no time to get off. The stop is very

late long short

21. The third stop is Johnson City. This is where we change engines. The stop at Johnson City has to be long enough to put on a new

engine hat train

22. From Johnson City it is only one hour to the city where my friend lives. One hour after we leave Johnson City, I will get

in off wet

23. For the last hour, most of the way is through forest. For that part of the trip we see many trees, but we see very few

branches houses leaves

24. There are some animals in the forest. But these animals are afraid of the train. When a train comes through the forest they run

away by up

25. Because the animals are afraid, we will probably not see them. They will keep out of sight. We will be sorry not to see the

trees animals people

26. At the fifth stop, I will get off the train. Roger will meet me at the station. I will be glad to see him in the

car morning station

BEST COPY AVAILABLE

27. From the station we will drive to Roger's house. We have to drive all the way across town from the south to the north. On the south side of town is the

house lake station

28. Roger lives on the edge of town. It is a short walk from his house to the lake. It is easy to walk from his house to the

lake station store

29. The lake by Roger's house is very wide. It is two miles to the far side. Houses on the far side of the lake look very

large pretty small

30. A road goes all the way around the lake. It makes a very long walk around the lake, but it is not hard to go around in a

car hurry minute

31. Roger has two friends who live in the house next to his. Both of them are boys. How many boys live in the house next to Roger?

one two three

32. Roger likes to play ball with his two friends. They all play on a team at school. There are five boys on the team. Two other boys play on the team with Roger and his

friends sisters uncles

33. On the other side of the lake there are several large farms. The farms grow mostly corn to feed to animals. These animals like to eat

corn fish meat

34. We will go to see the farms. We will work helping the farmer feed his animals. If we work hard, we may get a treat from the

animals farmer help

TURN THE PAGE

35. It will be hot working on the farm. When we are through we will swim in the lake. This will make us feel much
 cooler sleepier stronger
36. I will stay at Roger's house for ten days. After that I will come back to my own house. I will stay at Roger's house more than a
 month week year
37. When I come back home Roger's father will drive me in his car. It will take about six hours. We will leave in the middle of the morning and get home in the middle of the
 afternoon night morning
38. The road from Roger's house to mine is not a good road. It was built many years ago. It has had much wear, and the ride will be
 bumpy quick slippery
39. It will be good to be home again. The trip will be great fun, but I will miss my own family. When I get home and see them, I will be
 happy sick tired
40. My friends at home will be glad to see me too. When I am home we sometimes fight, but when I come back from a trip they are always
 alone mad nice

END OF BOOKLET 3

Pop 1, p. 11

"Put booklet No. 3 back into the large envelope and take out Booklet 3J. The test in this booklet is exactly the same as the practice test. You must read the story as quickly as you can and underline the right word after each part of the story. You will have four minutes for this. Are you ready? begin."

After 4 minutes say:-

"Stop working and put your pencil down."

IEA/M3

Pop 11, p. 13

"Put Booklet 7 back into the large envelope. Take out Booklet 7J. This test is exactly the same as the practice test. You must read the stories as quickly as you can and underline the right word after each of the stories. You will have four minutes for this test. Are there any questions?"

Answer any questions, then say:-

"Begin".

After exactly four minutes say:-

"Stop working and put your pencils down."

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BOOKLET 3JREADING SPEED TESTDirections

Here is a story. The story has many little parts. When you come to the end of a part there will be three words like this:

one

two

three

Put a line under the word that fits in the story. For this test you underline the words in the booklet.

Read as fast as you can, and see how many parts of the story you can read and mark in the time that you have.

Remember - read as fast as you can, but be sure to mark the right word after each part of the story.

Do not use an eraser. If you change your mind, cross out your first answer and then put a line under your second choice.

1. Peter has a little dog. The dog is black with a white spot on his back and one white leg. The color of Peter's dog is mostly

black	brown	grey
-------	-------	------
2. When Peter got the dog it was a small puppy. Now the dog is a little more than two years old. How many years has Peter had the dog?

one	two	three
-----	-----	-------
3. Peter's dog has a spot on his back. That is why Peter named the dog Spot. The dog was named after the spot on his

back	ear	leg
------	-----	-----
4. The dog has learned to do two tricks. One trick is to catch a ball. To stand on its hind legs is the second

story	trick	way
-------	-------	-----
5. When he was a puppy Spot was fed three times a day. Now he is fed only once. The number of times is now

often	less	many
-------	------	------
6. Spot is most happy when he gets a bone. He would like to have a bone every day, but he does not get one that

small	hungry	often
-------	--------	-------
7. Spot lives in his own little house. It is a red house and it is made of wood. The house that Spot lives in is

green	red	white
-------	-----	-------
8. Peter's mother does not like to have Spot in her house when he has dirty feet. When his feet are dirty Spot must stay

inside	hungry	outside
--------	--------	---------
9. Sometimes Peter has dirty feet too. Then his mother makes him wipe them off on the mat. The mat is used to keep the house

clean	dry	warm
-------	-----	------

10. Peter likes to play with Spot. Often they run together. Peter can run quite fast, and yet Spot can run
- faster now home
11. One day Peter went for a long walk. Spot came along too. Spot had great fun. When Peter goes for a walk Spot always wants to
- eat go sleep
12. While they were walking they saw a bird. The bird was sitting on the ground under a tree. Peter saw the bird sitting on the
- branch ground tree
13. Spot saw the bird too. Spot wanted to catch the bird. The bird was something that Spot wanted to
- catch find scare
14. Spot ran after the bird. While he ran after the bird he kept barking. Spot was barking while he chased the
- ball bird boy
15. When Spot chased the bird it flew away. It flew up into the tree. It flew to the top of the tree and sat on a
- branch store box
16. Spot was surprised. He did not know where the bird had gone. He did not know that the bird had flown to the
- bush house tree
17. Spot ran around in circles. He ran this way and that way. He kept looking and looking. He was looking for the
- bird bone dog
18. The bird in the top of the tree started to sing. He sang because he was happy. Because he was safe in the tree he started to
- fly sing sleep
19. A second bird came to the tree too. He came to join the first bird. How many birds were there in the top of the tree now?
- none one two
20. The birds flew away from the tree together. They flew to a field of wheat. The birds were hungry and wanted to eat some
- berries corn wheat

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21. There were many birds in the field. They were all eating the grains of wheat. They were all eating the wheat in the
- box field house
22. Spot and Peter came walking by the field. When Spot saw the birds, he was very excited. He was excited to see so many
- birds grains people
23. Spot ran into the field. When he got to the middle of the field, he started to bark. He stood barking in the middle of the
- day field night
24. The birds did not wait for Spot. Before he reached the field they flew away. They flew away because they were
- afraid alone hungry
25. Spot did not know what to do next. He sat barking in the middle of the field. He sat and waited for Peter to
- bark come cry
26. Peter came to the edge of the field and stood still. Then he called to Spot. He called to Spot from the edge of the
- field road river
27. When Peter called, Spot ran over to him. Peter patted Spot on the head. Because Spot obeyed Peter, Peter thought he was a good
- boy dog fighter
28. They walked until they came to the main road. There they saw a bus come by loaded down with people. There were a great many people in the
- bus house town
29. The bus was going to the next town. In this town there is a large market. Many people ride the bus to go to the
- lake market station
30. Peter saw his father on the bus. Peter's father works in the next town. He has to ride the bus when it is time to go to
- bed visit work

31. Peter walked along the road with Spot. They met another dog on the road. Spot growled and growled at the other dog. Spot was not
- greedy friendly lonely
32. The other dog started to growl too. But then he turned and ran away. He was afraid of Spot. The other dog was not very
- hungry brave sad
33. Peter and Spot came to a bridge across a stream. Peter got some small stones from the side of the road. He threw them into the
- lake puddle stream
34. Spot saw Peter throw a stone. He started to run after the stone. He did not see the stream. He fell into the
- hole mud water
35. Spot started to swim. He swam across the stream and came out the other side. Then he ran back to Peter across the
- bridge lake field
36. Spot was all wet. He started to shake himself. He shook himself right beside Peter. When he shook himself, it made Peter
- glad hot wet
37. Peter stood in the middle of the bridge and watched the stream. He saw something small swimming in the stream. He thought it was a
- boat boy fish
38. Now it was time for Peter to go home. There was some work to do at home. Peter often did work in the garden. He was a very good
- cook gardener tailor
39. Peter and Spot hurried home. Peter's mother was waiting by the door. She had some gardening to be done, so she was glad to see
- sunshine Peter Spot
40. Peter hurried to get his work done. His mother had promised him some candy when he was finished. He wanted to finish so he could get the
- ball candy 31 money

The basic procedures to be followed in the main testing of the IEA Six-Subject Survey were set out in a series of manuals:

- Stage 2 IEA/M1 Manual for National Centers
 IEA/M2 Manual for School Coordinators
 IEA/M3 Manual for Test Administrators
- Stage 3 IEA/M1/Stage 3 Manual for National Centers
 IEA/M2/Stage 3 Manual for School Coordinators
 IEA/M3/Stage 3 Manual for Test Administrators

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The Data Bank Instrument Number which appears below is a new number, assigned since the instruments were administered for the purpose of easily linking items in the instruments with the resultant variables in the Data Bank holdings. Each such variable is named in the codebook using the new instrument number and (usually) the number of the item within the instrument from which the variable is derived. The key to the new instrument numbers is as follows:

1: Type of Instrument

- E = Examination (student)
 Q = Questionnaire (student)
 T = Teacher questionnaire
 S = School questionnaire

2: Student Population

- | | |
|--------------|---|
| 1 = I | 6 = II and IV |
| 2 = II | 7 = I, II and IV |
| 3 = III | 8 = I and IV |
| 4 = IV | S = IV Specialist |
| 5 = I and II | N = NA: Teacher or School questionnaire |

3: Subject

- S = Science
 R = Reading Comprehension
 L = Literature
 M = Mother Tongue (Reading Comprehension and Literature)
 E = English as a Foreign Language
 F = French as a Foreign Language
 C = Civic Education
 2 = All Stage 2 Subjects
 3 = All Stage 3 Subjects
 5 = All Stage 2 and Stage 3 Subjects

4-5: Instrument Within Type

One or two characters used when necessary to uniquely identify each instrument when there is more than one instrument of the same type.

Instrument Name Reading Comprehension Test - Section C

Data Bank Instrument Number E2RC

IEA/MS

Pop 11, p. 10-11

"From your large envelope take out Booklet 7. From the small envelope of answer cards, take out the pink answer card number 7. You are now going to do some tests to see how well you can read. You should fill in the ovals on your answer card in the same way as you did for the other tests. Look at the front of Booklet 7 and follow while I read the instructions. This is a test to see how well you understand what you read. The test is made up of four stories with a number of questions on each. Read the first story and so on until you come to the end of Section C.

"Each test item starts with a statement or question and then gives you four endings or answers. Pick the best ending or answer and blacken the space corresponding to the answer you have chosen on your answer card. You may read the stories over again as much as you need to. Try each question in turn. If you don't know the answer you may leave it and go on to the next. Come back to it later if you have time.

"You should answer even if you aren't sure; however do not guess blindly.

"When you finish one story, go ahead to the next. Keep on working until you reach the end of Section C. If there is any time left go back and try to do any questions that you skipped the first time through."

Then say:-

"The answers to the questions in Section C should be marked on Section C on your answer card. You will have fifty minutes to do this test. Are there any questions?"

I.E.A.

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11
12BOOKLET 7Reading ComprehensionDirections:

This is a test to see how well you understand what you read. The test is made up of four stories with a number of questions on each. Read the first story and then answer the questions on it. Then go on to the second story and so on until you come to the end of Section C.

Each test item starts with a statement or question and then gives you four endings or answers. Pick the best ending or answer and blacken the space corresponding to the answer you have chosen on your answer card.

You may read the stories over again as much as you need to. Try each question in turn. If you don't know the answer, you may leave it and go on to the next. Come back to it later if you have time.

You should answer even if you aren't sure; however, do not guess blindly.

When you finish one story go ahead to the next. Keep on working until you reach the end of Section C. If there is any time left, go back and try to do any questions that you skipped the first time through.

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Ernenek slipped out of his sleeping bag. On top of his clothes made of small auk's skins, with the feathers inside, he put on other clothes made of bear skin, with the fur on the outside, and pushed the trouser legs into his sealskin boots.

He came out of the narrow tunnel of the igloo on all-fours, pulling the half-asleep dog, who was the leader of the team, by its leash, while the other dogs followed yawning and shaking the rime off their thick fur. They clamoured for food by barking and showing their teeth which had been filed with stones so that they could not gnaw their bridles; they looked more like wolves than dogs with their pointed muzzles and their yellow, glowing eyes.

Ernenek iced the sledge runners, then he harnessed the dogs, unfastened the sledge anchor and climbed onto the sledge. Under the whip, the dogs formed out behind the leading dog, pulling on the traces, which attached them separately to the sledge and yelping behind the white clouds of vapour coming out of their mouths.

It was hot; the temperature must have been about 17 degrees below zero and Ernenek did not have to run behind the sledge to warm himself; he could remain sitting and enjoy the drive.

The icy ocean on which he travelled, frozen to a depth which exceeded a man's height and superficially covered with snow, bore the clear trace of the sledge of his friend who had started before him.

Ernenek did not turn to look at the solitary igloo he was leaving behind, a minute cute hump of ice at the top of the world.

1. Ernenek's dogs resembled wolves because they had
 - A. a very sharp sense of smell.
 - B. filed teeth and a small muzzle.
 - C. great strength to pull the sledge.
 - D. pointed muzzles and glowing eyes.

2. We can tell from the passage that auks are
 - A. animals like bears.
 - B. related to seals.
 - C. dogs that pull sledges.
 - D. birds.

3. The dogs' teeth had been filed with stones to make them
 - A. sharp.
 - B. clean.
 - C. smooth.
 - D. blunt.

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4. Why did Ernenek ice the runners of his sledge?
- A. to cool them off.
 - B. to make them slippery.
 - C. so he could harness the dogs.
 - D. to remove the dirt.
5. In describing the dogs, the writer tries to make them seem
- A. brave.
 - B. strong.
 - C. well-trained.
 - D. savage.
6. In saying that Ernenek's igloo was "at the top of the world", the writer means that it was
- A. on the icy ocean.
 - B. near the North Pole.
 - C. far from any other home.
 - D. very small and unimportant.
7. We can tell from the fourth paragraph that
- A. it was a really hot day.
 - B. Ernenek hated to run.
 - C. Ernenek got cold easily.
 - D. Ernenek was used to very cold weather.

Please turn over and continue.

Paracutin was born in Mexico in February, 1943. At the end of one week, Paracutin was 500 feet high and it is now over 9,000 feet high. Today Paracutin is asleep.

What is Paracutin? It is the only volcano in the world which has been seen from its birth right up to the present day. On February 20, 1943, a peasant and his wife set out to work in their maize fields from the Mexican village of Paracutin. They were surprised to find the earth warm under their feet. Suddenly they heard noises deep in the earth and a small hollow appeared in their field. In the afternoon there was a sudden loud noise and stones were flung high in the air. The peasants ran from the field and turned to watch. They saw the birth of a volcano.

There were great bursts of stone and lava and a little hill began to form. By evening this hill was 100 feet high and hot ashes were falling on the village. At night the glare of the hot lava lit up the countryside. The trees near the village were killed and the villagers had to leave their houses. When the village was abandoned, its name was given to the volcano. The news quickly spread to Mexico City, far to the east. Many sightseers and scientists flocked to the scene. The volcano grew and grew for ten years and hundreds of square miles of forest were destroyed. Then Paracutin went to sleep. In spite of all the explosions, not one person was killed.

8. Paracutin was once the name of
- a peasant.
 - a village.
 - an old mountain.
 - a Mexican.
9. What was destroyed in the eruption?
- only a village.
 - the villagers living close by.
 - the forests and fields round Paracutin.
 - two peasants.
10. When the writer says that Paracutin "went to sleep", he means that it
- flattened out.
 - stopped sending out ashes and lava.
 - will never be a volcano again.
 - got covered with grass and trees.
11. In this passage the author is trying to
- describe an interesting happening.
 - explain a scientific theory.
 - make us believe something.
 - build up suspense.

12. Paracutin is now
- A. erupting.
 - B. temporarily inactive.
 - C. permanently dead.
 - D. flattened.
13. From the story, where does it appear that Paracutin is located?
- A. In eastern Mexico.
 - B. In western Mexico.
 - C. In northern Mexico.
 - D. In southern Mexico.
14. What can we learn about volcanoes from this passage?
- A. New volcanoes may appear in unexpected places.
 - B. There have always been volcanoes on the earth.
 - C. Volcanoes are active from time to time.
 - D. Volcanoes are active for only a few months.

During the present century, scientific study of man's surroundings and experience is commonly accepted as the desirable way to determine the truth or falsity of statements, opinions, or beliefs.

This was not always so. During past centuries there was much reliance on authority. The opinions expressed by persons in positions of authority and the written statements in approved documents were frequently accepted and taught as oracles of truth. Those questioning the accuracy or validity of these opinions were in grave danger. Many persons, later recognized as leading contributors to the progress of mankind, suffered torture, imprisonment, and even death because they dared to question beliefs or opinions which we now see to have been demonstrably false.

The scientific method emphasized the inductive rather than the deductive approach to the solution of problems. The inductive method is characterized by observations, measurement, definition, enumeration, classification, and the formulation of conclusions on the basis of objective evidence. On the other hand, authoritarianism utilized the deductive method, namely, reasoning from the major premise to a conclusion, without necessarily making explicit all the elements involved in the final statement or opinion.

In one sense authority and scientific method may be harmonized. It is conceivable that the major premises of an authority may be based on scientific studies which have produced demonstrable truths. Deductions made with these truths as major premises and with strict adherence to the principles of logic should be valid.

15. Scientific method has been encouraged
 - A. for many centuries.
 - B. continuously.
 - C. recently.
 - D. by authoritarians.

16. "Authority" as used in line 6 of the above article, means
 - A. traditional wisdom.
 - B. scientific analysis.
 - C. inductively determined fact.
 - D. superstition.

17. Deductive reasoning assumes the accuracy of
 - A. conclusions.
 - B. major premises.
 - C. facts.
 - D. a logical synthesis.

18. A central idea of the preceding article is that
- A. deductive methods are hard to apply.
 - B. science and logic are opposed.
 - C. facts and opinions are about the same thing.
 - D. scientific and authoritarian methods may complement each other.
19. Which of the four paragraphs is primarily concerned with comparison?
- A. 1st
 - B. 2nd
 - C. 3rd
 - D. 4th
20. Which of the four paragraphs is primarily concerned with synthesis?
- A. 1st
 - B. 2nd
 - C. 3rd
 - D. 4th

If you were to begin to enumerate the various uses of paper, you would find the list almost without end. Yet, there was a time when this familiar item was a precious rarity, when the sheet of paper you now toss into the wastebasket without thinking would have been purchased at a great price and carefully preserved. Indeed, for long centuries in man's history, paper was unknown. People wrote on specially prepared sheepskins or goatskins called parchment.

About twenty-two hundred years ago, the Chinese people discovered how to manufacture paper from wood pulp. Later the secret reached Europe. But for many years, the whole operation was done by hand. Imagine making paper by hand, sheet by sheet! It was a reasonably simple process, but it is easy to see why paper was used only by the wealthy.

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The first machine for making paper was invented by a Frenchman named Louis Robert. It was a crude machine by today's standards. Many European and American inventors have since contributed to the development of the more efficient papermaking machines now in use. In our time, paper is used throughout the world.

21. A long time ago people used parchment to write on because
- parchment lasted a long time.
 - paper was unknown.
 - paper tore too easily.
 - parchment could be prepared easily.
22. The process of making paper was first discovered by
- an American.
 - the French.
 - the Chinese.
 - Louis Robert.
23. Why was the process of making paper by hand unsatisfactory?
- It was too complicated.
 - The paper was of poor quality.
 - It was too slow.
 - It was a secret.
24. We may conclude that, after Robert's invention, paper became
- cheaper.
 - more valuable.
 - stronger.
 - rarer.
25. The main point that is being brought out by the first paragraph of this story is that
- it is only recently that paper has been widely available.
 - for some uses parchment is better than paper.
 - one can invent many different uses for paper.
 - one should not throw paper in the waste basket.
26. The person who wrote this story was trying to
- amuse us.
 - help us to learn something new.
 - change how we feel about something.
 - write something very pretty.

END OF SECTION D

41

DO NOT TURN OVER UNTIL YOU ARE TOLD TO DO SO

The basic procedures to be followed in the main testing of the IEA Six-Subject Survey were set out in a series of manuals:

- Stage 2 IEA/M1 Manual for National Centers
 IEA/M2 Manual for School Coordinators
 IEA/M3 Manual for Test Administrators
- Stage 3 IEA/M1/Stage 3 Manual for National Centers
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3: Subject

- S = Science
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4-5: Instrument Within Type

One or two characters used when necessary to uniquely identify each instrument when there is more than one instrument of the same type.

Instrument Name Reading Comprehension Test - Section D

Data Bank Instrument Number E2RD

"From your large envelope take out Booklet 7 and your pink answer card 7. You are going to take another test to find out how well you read. [See instrument number E2RC for information about the instructions given for the test just prior to this one] The answers to the questions will be marked in Section D of your answer card. Although there are 29 questions on the answer card there are only 26 questions in the Section. You should therefore leave questions 27, 28 and 29 blank. Turn to Section D of your booklet. You will have fifty minutes to do this test. Are there any questions?"

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IEA/7 D

SECTION D

Deep silence reigned over the camp; only the guards were awake. Wrapping his warm cloak closely about him, a sentry on the furthest outpost stamped restlessly. His attention was caught by furtive shadows moving between him and the first grey light and he sensed approaching danger. The alarm was still ringing clear from his bugle as the company of the Legion seized their rifles and fell into battle order. There was no confusion, only an almost incredible neatness and speed. The square was formed about the well with the camels haltered in the middle and the guns placed at the corners. A few signal shots were fired and the sentries fell back on the main body of the troop. All night the enemy had been gathering silently behind the encircling dune and now, with lance and sword, they charged from the surrounding crests. Three sides of the square stood firm; the fourth wavered and broke. The enemy poured into the square, stampeding the camels and stabbing the men in the back.

1. The attack took place in a
 - A. forest.
 - B. desert.
 - C. small town.
 - D. mountain pass.
2. The attack took place just at
 - A. daybreak.
 - B. midnight.
 - C. nightfall.
 - D. the rise of the moon.
3. We can tell that the night was
 - A. hot.
 - B. cold.
 - C. stormy.
 - D. moonlit.
4. The camels were mostly
 - A. killed.
 - B. seized.
 - C. ridden away.
 - D. driven off.
5. The camping place was located
 - A. on a hillside.
 - B. on high ground.
 - C. in a hollow.
 - D. away from the water.
6. After the alarm was sounded, the sentries
 - A. came in to the rest of the troop.
 - B. ran away in fright.
 - C. kept firing at the enemy.
 - D. blew their bugles.

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In their first experiments the researchers let the camel have no water in eight days. It lost about 22% of its weight, about 100 kilos. When it finally was given water to drink it emptied one bucket after another, got rounder and rounder and soon returned to its normal condition. A camel can lose anything up to 25% of its weight through evaporation without any danger of losing its life. However, a loss of weight of 12% causes a man to die in a desert. The researchers, who were fond of animals, did not dare to find out how long a camel can stay alive without water. The camel that went longest without water drank 135 liters of it in 10 minutes after 17 days without a drink.

A camel can manage with a small amount of water better than a man can. And furthermore, it can regulate its perspiration much better than we can. If we are compelled to stay in a temperature higher than our normal body temperature, we start to perspire in order to prevent the temperature of our organs from becoming dangerously high. A camel's temperature regulation is different. When the sunshine becomes hotter and hotter the body temperature of the camel follows the temperature of the environment. Only when the body temperature has risen to 40 degrees does a camel begin to perspire. When the cold night of the desert arrives a camel's temperature sinks to 34 degrees. This variation of 6 degrees means that it takes quite a long time in the daytime before a camel starts perspiring.

7. The purpose of this passage is chiefly to explain why a camel
- can lose so much weight.
 - can drink so much water.
 - does not perspire so much.
 - is so well suited to the desert.
3. In saying that camels "can regulate perspiration much better than we can", the author means that the camel
- can turn his perspiration off and on as he wishes.
 - has more sweat glands than we have.
 - responds to smaller changes in temperature.
 - does not start to perspire as soon as we do.
9. The function of perspiration in man is to
- prevent a drop in body temperature.
 - regulate the body temperature.
 - let fluid from the body.
 - remove salt from the body.
10. When the temperature of the air rises above 34°C a camel starts
- perspiring heavily.
 - saving energy.
 - showing a higher body temperature.
 - regulating its drinking of water.

Please turn over and continue

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11. The relation between the first and second paragraphs of this article is that the second paragraph
- A. helps explain the results reported in the first.
 - B. gives further detail about the results reported in the first.
 - C. is more specific than the first in the information it provides.
 - D. presents a different point of view from the first.
12. Judging from the passage, about how much does a camel weigh?
- A. 100 kilograms.
 - B. 500 kilograms.
 - C. 2200 kilograms.
 - D. There is no way of telling.

Please continue

All day long we had been motoring towards Fez, and as we drew nearer to it, but at a distance still of some thirty or forty miles, we began to feel the emanation of a great and ancient city, in the same way that you have the identical experience when approaching the environs of Rome or Paris or London or Peking, some essence, indefinable but not to be confounded with any other, asserting itself in the atmosphere. Unlike a European city, Fez has no outer suburbs, and is enclosed by its own walls; but even the brown-faced, brown-legged, shaven-headed peasants, who in their dazzling white clothes worked in the sepia-colored fields - hardly so much fields as wide territories - seemed to carry some unidentifiable echo of tradition, perhaps of Pharaoh's Egypt. It was not until darkness had enveloped them that we arrived before the majestic crenellated walls of the city, and outside the gates the strings of camels, the story-tellers and snake-charmers and lank ebony minstrels, hung with cowrie-shells, from the dark interior of the continent, and the jostling, wondering crowds that surround them by daylight had taken their departure.

13. How were the boundaries of a field in which a peasant was working marked off?
- The boundaries were marked by palm trees.
 - The boundaries were marked by thick hedges.
 - There was a fence around each field.
 - There were no clear boundaries.
14. What was it that first informed the travellers that they were approaching Fez?
- The city walls.
 - The sepia-colored fields.
 - An indefinable feeling.
 - The tradition of Pharaoh's Egypt.
15. When the travellers were confronted by the city walls they appeared to be
- intimidated.
 - impressed.
 - disinterested.
 - astounded.
16. The travellers arrived at the city walls when the jostling crowds
- were starting to gather.
 - were at their peak.
 - were getting ready to leave.
 - had gone.
17. The author's primary purpose in this passage is to
- provide a vivid and interesting description.
 - inform the reader about important facts.
 - change the reader's attitudes.
 - build up a feeling of suspense.

Please turn over and continue

18. In the paragraph that follows this one it is likely that the author will
- A. tell about the construction of the city's walls.
 - B. describe their entrance into the city itself.
 - C. tell about the early history of the city.
 - D. describe the home life of the peasants.
19. The author's style is best described as
- A. simple and direct.
 - B. forceful.
 - C. dull and prosaic.
 - D. flowery and elaborate.

Please continue

Traditional leather men laugh at the claims made for plastic. They say that plastic shoes are hot in summer and cold in winter. It is not so good as leather, and plastic of high quality is not cheap enough to make it profitable for shoemakers to change from leather.

This may be true for men, who buy strong, comfortable and well-made shoes. Women, however, want fashionable shoes, and do not care too much what they are made of as long as they look smart. The high quality of leather needed to make smart and attractive women's shoes is very expensive and these shoes are so well made that they outlast the rapid changes of fashion. Only a few women can afford to buy a new pair of leather shoes each time the fashion changes.

Perhaps there will be two kinds of shoemakers in the future, those making shoes for men and the luxury market for women, whose material will be leather, and those aiming at the popular market for women. Does this mean that men will only be able to buy strong, lasting, leather shoes, and women only able to afford cheap, fashionable, plastic shoes made to last only for a few months?

20. Which of the three paragraphs represents primarily a guess about the future?
- Only the second.
 - Only the third.
 - The first and the second.
 - The second and third.
21. Women seem more likely to use plastic shoes than men because women
- are more interested in style.
 - don't want shoes that wear well.
 - can't afford to pay as much for shoes.
 - are not as hard on their shoes.
22. Which women does the writer think will continue to wear leather shoes? Women who
- are interested in fashion.
 - want new shoes frequently.
 - are difficult to fit.
 - are wealthy.
23. The author's purpose in this passage is primarily to have us
- know more about modern techniques in shoe-making.
 - enjoy an interesting story about shoes.
 - become aware of differences between men and women.
 - think about future changes in shoes.

Please turn over and continue

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24. Which sentence best conveys the main idea of this passage?
- A. First sentence of the first paragraph.
 - B. Last sentence of the first paragraph.
 - C. Last sentence of second paragraph.
 - D. First sentence of third paragraph.
25. What is the writer's attitude about making shoes of plastic?
- A. He favors them for both men and women.
 - B. He favors them for women but not for men.
 - C. He is against them for both men and women.
 - D. He does not express his own attitude.
26. How is the third paragraph related to the first two? It is a
- A. speculation based on facts given in the first two.
 - B. summary of points made in the first two.
 - C. contradiction of the first two.
 - D. explanation of the first two.

END OF SECTION D

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4-5: Instrument Within Type

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Instrument Name Reading Comprehension Test - Section C

Data Bank Instrument Number E4RC

"From your large envelope take out Booklet 14. From the small envelope of answer cards, take out the pink answer card number 7. You are now going to do some tests to see how well you can read. You should fill in the ovals on your answer card in the same way as you did for the other tests. Look at the front of Booklet 14 and follow while I read the instructions.

This is a test to see how well you understand what you read. The test is made up of four stories with a number of questions on each. Read the first story and so on until you come to the end of Section C. Each test item starts with a statement or question and then gives you four endings or answers. Pick the best ending or answer and blacken the space corresponding to the answer you have chosen on your answer card. You may read the stories over again as much as you need to. Try each question in turn. If you don't know the answer you may leave it and go on to the next. Come back to it later if you have time. You should answer even if you aren't sure; however, do not guess blindly. When you finish one story, go ahead to the next. Keep working until you reach the end of Section C. If there is any time left go back and try to do any questions that you skipped the first time through."

Then say:-

"The answers to the questions in Section C should be marked in Section C on your answer card. You will have fifty minutes to do this test. Are there any questions?"

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BOOKLET 14Reading ComprehensionDirections

This is a test to see how well you understand what you read. The test is made up of four stories with a number of questions on each. Read the first story and then answer the questions on it. Then go on to the second story and so on until you come to the end of Section C.

Each test item starts with a statement or question and then gives you four endings or answers. Pick the best ending or answer and blacken the space corresponding to the answer you have chosen on your answer card.

You may read the stories over again as much as you need to. Try each question in turn. If you don't know the answer, you may leave it and go on to the next. Come back to it later if you have time.

You should answer even if you aren't sure; however, do not guess blindly.

When you finish one story go ahead to the next. Keep working until you reach the end of Section C. If there is time left, go back and try to do any that you skipped the first time through.

During the present century, scientific study of man's surroundings and experiences is commonly accepted as the desirable way to determine the truth or falsity of statements, opinions, or beliefs.

This was not always so. During past centuries there was much reliance on authority. The opinions expressed by persons in positions of authority and the written statements in approved documents were frequently accepted and taught as oracles of truth. Those questioning the accuracy or validity of these opinions were in grave danger. Many persons, later recognized as leading contributors to the progress of mankind, suffered torture, imprisonment, and even death because they dared to question beliefs or opinions which we now see to have been demonstrably false.

The scientific method emphasized the inductive rather than the deductive approach to the solution of problems. The inductive method is characterized by observations, measurement, definitions, enumerations, classification, and the formulation of conclusions on the basis of objective evidence. On the other hand, authoritarianism utilized the deductive method, namely, reasoning from the major premise to a conclusion, without necessarily making explicit all the elements involved in the final statement or opinion.

In one sense authority and scientific method may be harmonized. It is conceivable that the major premises of an authority may be based on scientific studies which have produced demonstrable truths. Deductions made with these truths as major premises and with strict adherence to the principles of logic should be valid.

1. Scientific method has been encouraged
 - A. for many centuries.
 - B. continuously.
 - C. recently.
 - D. by authoritarians.
2. "Authority" as used in line 8^s of the above article, means
 - A. traditional wisdom.
 - B. scientific analysis.
 - C. inductively determined fact.
 - D. superstition.
3. Deductive reasoning assumes the accuracy of
 - A. conclusions.
 - B. major premises.
 - C. facts.
 - D. a logical synthesis.
4. A central idea of the preceding article is that
 - A. deductive methods are hard to apply.
 - B. science and logic are opposed.
 - C. facts and opinions are about the same thing.
 - D. scientific and authoritarian methods may complement each other.

5. Which of the four paragraphs is primarily concerned with comparison?
- A. 1st
 - B. 2nd
 - C. 3rd
 - D. 4th
6. Which of the four paragraphs is primarily concerned with synthesis?
- A. 1st
 - B. 2nd
 - C. 3rd
 - D. 4th.

Please turn over and continue.

All plays must leave out certain facts of life and aspects of human nature; there is not room in a play for everything, nor does the nature of the form demand that there should be. We do not, for instance, ask for the element of probability in a farce, or in a light comedy. We do not expect restraint and common-sense in a tragedy; for if they were present there would be no tragedy. In brief, we expect an author to leave bits of human nature out - to present an artificial concoction rather than a true-to-life one. We ask only that he make this artifice seem plausible; that is to say, if he does his work well, we should not notice the elements he has left out - and the more we do notice their absence, the more unimpressed we are by his skill. Of course, we value most highly the dramatists who manage to include the maximum of elements with the minimum of clumsiness; for we reckon, quite correctly, that a play is both more plausible and more interesting if the characters involved in it are full, like Brutus, of mixed elements and must struggle inside themselves to reach conclusions and perform big actions: this is at least partly what we mean when we say that Shakespeare embraces all humanity, or that characters are "whole" persons rather than bitty cut-outs. When things are made too plain-sailing for characters - when they represent only ambition, or only pride, or only greed, and have no opposites to these in them to make decisions hard for them - then we may accept them as absurd or melodramatic characters, or even as a certain sort of stylised particulars, but we cannot respond to them as fully as we can to Macbeth, or Lear, or Tartuffe, or the people in Chekhov. They are doubtful to us because they have no doubt themselves.

7. Plays must
 - A. imitate life.
 - B. select from life.
 - C. exercise restraint.
 - D. use common sense.

8. A play designed to produce laughter is expected to portray incidents which are
 - A. natural.
 - B. improbable.
 - C. true-to-life.
 - D. elementary.

9. The conviction which a play carries depends on our not being aware of
 - A. its plausibility.
 - B. the maximum of elements.
 - C. the things left out.
 - D. the mixture of characters.

10. Characters appear absurd or doubtful to us if they contain no
 - A. ambition.
 - B. style.
 - C. inconsistencies.
 - D. stylised peculiarities.

11. The writer of this passage is trying to present
- A. a point of view in literary criticism.
 - B. a closely reasoned argument.
 - C. a description of a set of facts.
 - D. a theory of human nature.
12. Which of the following sentences in the paragraph first introduces an important new idea?
- A. 3rd
 - B. 4th
 - C. 5th
 - D. 6th
13. What support does the author provide for the position that he is taking?
- A. Examples and illustrations.
 - B. Common knowledge.
 - C. A series of investigations.
 - D. Essentially no support.

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The history of the discovery of the Peking man was exciting despite the fact that this time it was not a more or less accidental discovery but the result of systematic excavation. In 1921 some Swedish and American paleontologists were excavating on a hill near Peking. The hill was called the Hill of Chicken Bones because bones of small birds had been found on it. Then a man walked by, watched the strange work going on and said that if the gentlemen were looking for the bones of dragons, he knew a place where they could find much bigger bones.

The man took them to a limestone cave which was about one kilometer away. In the summers of 1921 and 1923 a lot of bones of big mammalia were found there. They were typical of the Quarternary fauna. Along with the bones some sharp-edged pieces of quartz were found which could be thought to be elementary tools. The professor who led the research work could not give up his idea that in the light of these discoveries it would be possible to find remains of primitive men on the continent of Asia. In 1927 excavations were started in the cave of Tsou-kou-tien but the whole summer passed without any discoveries. Finally, three days before winter stopped the field-work one tooth of a man was found.

It was a molar tooth of a lower jaw. After examining it very carefully one of the researchers came to the conclusion that the tooth did not belong to any known type of man, nor to any living race. On the basis on this one tooth the researcher named not only a new species of man but also a new race, the Chinese man.

14. On the basis of what find was the important conclusion described in the passage made?
- A molar tooth.
 - Some tools.
 - Some bones of birds.
 - Some pieces of quartz.
15. The conclusion that the research worker reached is based upon the assumption that one can
- describe a human culture from the tools it used.
 - find human remains by digging in the right places.
 - make faster progress searching systematically than hunting blindly.
 - accurately reconstruct a complete creature from one small part.
16. The basic pattern of the organization of this passage is
- logical.
 - chronological.
 - from general to specific.
 - from specific to general.

17. What led the scientist to believe that he would find evidence of primitive men on the continent of Asia?
- A. A molar tooth from a lower jaw.
 - B. Mammalian bones and sharp-edged pieces of quartz.
 - C. The statement of the Chinese about dragon bones.
 - D. The excavations at the Hill of Chicken Bones.
18. The author of this passage is primarily interested in
- A. telling an entertaining story.
 - B. describing a series of events.
 - C. influencing the beliefs and feelings of his readers.
 - D. proving a scientific theory.
19. The bones that the investigators first found when they started digging in the cave had come from early forms of animals like
- A. horses, bears, or tigers.
 - B. dragons.
 - C. small birds.
 - D. dinosaurs.

Please turn over and continue.

commodities and services to which no flow of money payments corresponds. It can be divided into three groups. The first consists of goods and services received in barter, such as farm rents paid in kind. From the point of view of the nation's productivity or welfare the omission of such bartered goods would obviously underestimate the total performance of the economic system. The second group consists of goods and services received gratis. The difficulty here is not the lack of monetary form but the absence of any productive service rendered by the recipient. In such cases, since no production of new economic goods takes place, it appears advisable to exclude the goods from the national income total. If an individual received charity or a gift this is but a loss on the part of the donor (whose income has been recorded fully elsewhere), and to count the incomes of both donor and recipient involves either double counting or the consideration of the charity or gift recipient as a producer of service to the donor, an obviously far-fetched conception. The problem becomes more complicated when such free flow of goods (or money) is directed not from individuals but from the business system, either directly or through such social agencies as the government or charitable foundations. Such free goods, whether in the form of money or of commodities, must obviously be counted in somewhere in the national total. While their statistical estimate is difficult, their analytical and quantitative importance is appreciable and likely to grow in the future. The third type of commodities and services for which there is no corresponding money payment comprises those produced and consumed within the individual economic unit. Here the main problem lies in the segregation of economic from non-economic activity, since only a rigid line between the two will enable one to include in or exclude from national income such items as commodities produced as a hobby, services or durable goods used in the household or personal services of housewives and other members of the family. But there is no hard and fast rule by which economic activity can be distinguished from social and individual life in general. The importance of economic motives, the regularity of the activity, the relative proportion in which the resulting commodities and services appear on the market - all have to be considered. No doubt appears as to the propriety of including in national income commodities regularly produced and consumed within the household when they form part of a larger total destined for the market. Similarly, the estimate of national income should include net services from houses owned and inhabited; but there is considerable doubt as to the propriety of including net services of other durable goods. Finally, there is a general agreement among students of the problem as to the exclusion of housewives' services and services of other members of the family, because these activities are motivated largely by non-economic considerations and form much more of a part of life in general than of professional economic activity proper.

20. In return for his services a minister receives (1) a modest cash salary, (2) the use of a house, and (3) the use of an automobile. According to the passage, which of these should be considered part of the national income?

- A. Only (1) and (2).
- B. Only (1) and (3).
- C. Only (2) and (3).
- D. Only (1).

21. The "free flow of goods" refers to
- trade not encumbered with tariffs or restrictions.
 - gifts for which no return is received.
 - the surplus profits of the business system.
 - the easy exchange of goods for money.
22. Why would the work of a housewife in her home not be considered part of the national income?
- No money is paid for the work.
 - The motivation underlying the work is not economic.
 - No tangible product is involved.
 - The product is totally consumed within the home.
23. Why might a charitable contribution from a business concern be counted in the national income even though one from an individual would not?
- The business concern is directly involved in the nation's productive system.
 - The contribution from the business has not been counted anywhere else.
 - The contribution from the business concern is a necessary part of the cost of doing business.
 - A business is more likely to make a contribution to an institution or organization which must count it as income.
24. On what grounds would the fee of a concert violinist be considered part of the national income while the receipts of a violinist playing on the street corner for nickels would not?
- The different motivations of the violinists in the two cases.
 - The different motivations of those who provide the money in the two cases.
 - The different amounts of money involved in the two cases.
 - The fact that the street violinist is untrained.
25. A business man makes fine furniture in his spare time as a hobby, using some in his house and giving some to friends. On what basis would his product be excluded from the national income?
- Part of the product is consumed within the home.
 - No cash transaction is involved.
 - The motive for the production is not economic.
 - The cost of the furniture has already been counted as national income.

END OF SECTION C

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 5 = All Stage 2 and Stage 3 Subjects

4-5: Instrument Within Type

One or two characters used when necessary to uniquely identify each instrument when there is more than one instrument of the same type.

Instrument Name Reading Comprehension Test - Section D

Data Bank Instrument Number E4RD

IEA/MS

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Pop IV, p. 13

"You are going to take another test to find out how well you read. [See instrument number E4RC for information about the instructions given for the test just prior to this one] The answers to the questions will be marked in Section D of your answer card. Turn to Section D of your booklet. You will have fifty minutes to do this test. Are there any questions?"

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All day long we had been motoring towards Fez, and as we drew nearer to it, but at a distance still of some thirty or forty miles, we began to feel the emanation of a great and ancient city, in the same way that you have the identical experience when approaching the environs of Rome or Paris or London or Peking, some essence, indefinable but not to be confounded with any other, asserting itself in the atmosphere. Unlike a European city, Fez has no outer suburbs, and is enclosed by its own walls; but even the brown-faced, brown-legged, shaven-headed peasants, who in their dazzling white clothes worked in the sepia-colored fields - hardly so much fields as wide territories - seemed to carry some unidentifiable echo of tradition, perhaps of Pharaoh's Egypt. It was not until darkness had enveloped them that we arrived before the majestic crenellated walls of the city, and outside the gates the strings of camels, the story-tellers and snake-charmers and lank ebony minstrels, hung about with cowrie shells, from the dark interior of the continent, and the jostling, wondering crowds that surround them by daylight had taken their departure.

1. How were the boundaries of a field in which a peasant was working marked off?
 - A. The boundaries were marked by palm trees.
 - B. The boundaries were marked by thick hedges.
 - C. There was a fence around each field.
 - D. There was no clear boundary.

2. What was it that first informed the travellers that they were approaching Fez?
 - A. The city walls.
 - B. The sepia-colored fields.
 - C. An indefinable feeling.
 - D. The traditions of Pharaoh's Egypt.

3. When the travellers were confronted by the walls they appeared to be
 - A. intimidated.
 - B. impressed.
 - C. disinterested.
 - D. astounded.

4. The travellers arrived at the city walls when the jostling crowds
 - A. were starting to gather.
 - B. were at their peak.
 - C. were getting ready to leave.
 - D. had gone.

5. The author's primary purpose in this passage is to
 - A. provide a vivid and interesting description.
 - B. inform the reader about important facts.
 - C. change the reader's attitude.
 - D. build up a feeling of suspense.

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6. In the paragraph that follows this one it is likely that the author will
- A. tell about the construction of the city's walls.
 - B. describe their entrance into the city itself.
 - C. tell about the early history of the city.
 - D. describe the home life of the peasants.
7. The author's style is best described as
- A. simple and direct.
 - B. forceful.
 - C. dull and prosaic.
 - D. flowery and elaborate.

Please turn over and continue.

The meeting and overtaking of vehicles on rails, either moving or stationary, for which tracks have been laid on the road, is done on the right.

All the same, these movements can be carried out on the left if they cannot be done on the right owing to the narrowness of the space to pass in or to the presence of a parked or stationary vehicle or any other fixed obstacle and provided that this does not endanger road users coming from the opposite direction. Overtaking can also be done on the left in one way streets, when this is justified by the demands of the traffic.

When a vehicle on rails has stopped to allow passengers to enter or alight, whether the track is actually laid on the road or not, the driver may only pass the vehicle on the track, either on the left or on the right, at a reduced speed. Except at these places where the traffic is controlled by a policeman or by traffic lights, the driver driving on the side where the passengers are entering or alighting from the stationary vehicle on the rails must allow them either to reach this vehicle or to pass on to the pavement at the side. He must be prepared to stop if necessary for this purpose.

NOTE: Use street-cars or tram, not both. Whichever term or translation is natural for the country.

8. The audience for whom this passage was written was primarily
 - A. drivers of motor vehicles.
 - B. motormen of street-cars (trams).
 - C. passengers getting on and off street-cars.
 - D. policemen directing traffic.

9. The primary purpose of this passage was to provide a set of instructions for
 - A. safe driving.
 - B. passing on the left.
 - C. passing vehicles on rails.
 - D. protecting the safety of pedestrians.

10. Under which of these circumstances was passing on the left usually permissible?
 - I. one-way street.
 - II. cars parked too close on right.
 - III. at a traffic light.
 - IV. streetcar (tram) stationary.
 - A. I & II
 - B. I & III
 - C. I & IV
 - D. II & IV

11. When a street-car (tram) has stopped to let passengers off, a driver must always
 - A. stop.
 - B. slow down.
 - C. pass on the right.
 - D. keep a distance of at least 10 feet.

12. The instruction that applies whether the street-car tracks are laid on or beside the road has to do with
- A. letting passengers off.
 - B. the side on which to pass.
 - C. stopping at traffic lights.
 - D. endangering traffic coming the other way.
13. The relation of the second paragraph to the statement made in the first paragraph is that it
- A. states more fully the conditions under which the rule holds.
 - B. develops the reasons for the rule.
 - C. indicates exceptions to the general rule.
 - D. applies the rule in one special situation.
14. The material in this passage was organized by the author primarily so that the reader would know
- A. why he is to act in a certain way.
 - B. who is responsible in the situation.
 - C. what is likely to happen next.
 - D. what actions he is to take.

Please turn over and continue.

Effective thinking, while starting with logic, goes further so as to include certain broad mental skills. It includes the understanding of complex and fluid situations, in dealing with which logical methods are inadequate as mental tools. Of course, thinking must never violate the laws of logic, but it may use techniques beyond those of exact mathematical reasoning. In the fields of social study and history, and in the problems of daily life, there are large areas where evidence is incomplete and may never be completed. Sometimes the evidence may be also untrustworthy; but if the situation is practical, a decision must be made. The scientist has been habituated to deal with properties which can be abstracted from their total background and with variables which are few and well defined. Consequently, where the facts are unique and unpredictable, where the variables are numerous and their interactions too complicated for precise calculation, the scientist is apt to throw up his hands in despair and perhaps turn the situation over to the sentimentalists or the mystic. But surely he would be wrong to ignore both this type of problem and this type of thinking; for the methods of logical thinking do not exhaust the resources of reason. In coping with complex and fluid situations we need thinking which is relational and which searches for cross bearings between areas; this is thinking in a context. By its use it is possible to reach an understanding of historical and social materials and of human relations, although not with the same degree of precision as in the case of simpler materials and recurring events. As Aristotle says, "It is the mark of an educated man to expect no more exactness than the subject permits."

15. The author believes complex practical problems can be solved
- A. by the use of logic alone.
 - B. only if the rules of logic are disregarded.
 - C. only if all the facts are known.
 - D. only by using both logical and non-logical reasoning.
16. The author implies that mathematical reasoning is likely to be employed with advantage
- A. when the situations to be dealt with are complex and fluid.
 - B. in history, social study, and the problems of everyday life.
 - C. in stable, clear-cut situations, where there are few unknown or varying factors.
 - D. in dealing with practical problems.
17. The author believes scientists should widen their field of work by undertaking problems that are
- A. less specific and less precise.
 - B. more exact.
 - C. more abstract.
 - D. less complex and fluid.

18. "Relational thinking" is principally of advantage in
- A. providing working solutions to problems for which the calculation of exact answers is impossible.
 - B. dealing with problems for which only an approximate answer is desired.
 - C. providing exact answers to ill-defined problems.
 - D. dealing with problems related in thought.
19. The author's purpose in this passage is primarily to present
- A. a philosophical point of view.
 - B. some important information.
 - C. a piece of effective literary composition.
 - D. a cleverly conceived argument.
20. In speaking of "thinking which is relational", (line 22) the author is contrasting this with
- A. exact mathematical reasoning.
 - B. thinking that violates the laws of logic.
 - C. intuitive approaches to human problems.
 - D. Aristotle's point of view.
21. That one should expect no more exactness than the subject permits is endorsed by
- A. only the author.
 - B. only Aristotle.
 - C. the author and Aristotle.
 - D. the author and traditional scientists.

Please turn over and continue.

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The next 100 years were destined to be the most fertile in the history of horology, because the foundations of nearly all the basic inventions appeared during this period. Robert Hooke, one of the great pioneers, is credited with the invention of the anchor escapement about 1666. This consisted of an anchor-shaped piece of steel, the points of which spanned several teeth of a sharp-toothed gear wheel. When this anchor rocked on a properly placed pivot, it allowed one tooth of the gear wheel to escape at each side of its swing, and the act of blocking the opposite tooth gave sufficient impulse to keep the pendulum swinging. This was a great step in advance in accuracy, and the majority of existing clocks were changed from foliot and verge to anchor escapement. Hooke contributed greatly to the mathematics of horology, and also invented the cylinder escapement which has endured to modern times, becoming the standard escapement for low-priced Swiss watches. As early as 1525, one John Leck of Prague had made a clock having a soft metal fusee. It remained, however, for Hooke to investigate scientifically the various properties of springs which included the fusee. He reinvented and described the fusee, which consisted of cutting a spiral on a conical drum attached to the first wheel. On this was wound first a piece of catgut and later a small chain, the other end of which was fastened to the cylindrical periphery of the barrel containing the main spring. The spiral was arranged so that the large diameter of the spiral was opposite the run-down position of the main spring. That meant that when the watch was fully wound the main spring, through its chain, was pulling on the small diameter of the spiral and, as the mechanism ran down and the tension of the main spring decreased, it was continually pulling on a larger radius, thereby tending to maintain a more constant power on the train and thus helping the mechanism to run at a more constant rate.

George Graham perfected Hooke's anchor escapement by broadening the face of the teeth on the anchor from Hooke's sharp points. This slight broadening prevented the escapement from swinging a little too far at each end of its swing, which can be detected in anchor escapement clocks by the tendency of the seconds hand to recoil slightly at each second. Graham's addition of the slight flats prevented this tendency; the deadbeat escapement did not have this overtravel and is the most common in modern use. This slight change was one of the most important steps in perfecting the time-keeping capabilities of the clock mechanism. Graham realised that temperature would change the length of the pendulum and hence have considerable influence on the rate of a clock. It has since been shown that 1 degree F. change in temperature of the steel rod of a seconds pendulum is equivalent to approximately four seconds in 24 hours, a brass rod, about twice as much; and a glass one, about half as much. Knowing roughly these facts, Graham suggested a compound pendulum composed of steel and brass, and so arranged that the different rates of expansion would offset one another. He abandoned this however, in favor of the mercury reservoir which he invented in 1711 and which, up to the invention of invar and some of the newer alloys that have practically zero coefficient of expansion under heat, was the most accurate pendulum known.

22. A grooved cone of metal is used in
A. a fusee.
B. a cylinder escapement.
C. a foliot.
D. an improved pendulum.
23. The kind of escapement most common in modern clocks is called the
A. anchor escapement.
B. cylindrical escapement.
C. deadbeat escapement.
D. compound escapement.
24. Which of the following types of escapements is probably most economical to construct?
A. Compound.
B. Deadbeat.
C. Cylinder.
D. Single.
25. The "next 100 years" referred to in the first sentence began about
A. 1525
B. 1575
C. 1600
D. 1650
26. One could tell whether an old grandfather clock had an anchor escapement or a deadbeat escapement by
A. observing the movement of the second hand.
B. checking to see whether it has a compound pendulum.
C. examining the points of the teeth on the first wheel.
D. inspecting the mainspring for the presence of a outgut attachment.
27. The most accurate pendulum available in the 18th century was the
A. foliot and verge.
B. compound pendulum.
C. mercury reservoir pendulum.
D. invar alloy pendulum.
28. In a compound pendulum, the length of the brass rods is about
A. half that of the steel rods.
B. the same as that of the steel rods.
C. one and a half that of the steel rods.
D. twice that of the steel rods.
29. The gain from using a cone with a spiral cut into it was that this made possible
A. compensation for the effect of temperature changes.
B. adjustment for the changing size of the expanding spring.
C. replacement of a pendulum with a spring.
D. nearly uniform power as the spring ran down.

END OF SECTION D

DO NOT TURN OVER UNTIL YOU ARE TOLD TO DO SO