

Test 3

Reading | 65 minutes, 51 questions

DIRECTIONS

Each passage below is followed by a number of questions. After reading each passage, choose the best answer to each question based on what is stated or implied in the passage.

Questions 1-10 are based on the following passage.

There were three great European nations in ancient days, each of which furnished history with a hero: the Greeks, the Carthaginians, and the Romans.

5 Alexander was the hero of the Greeks. He was King of Macedon, a country lying north of Greece proper. He headed an army of his countrymen, and made an excursion for conquest and glory into Asia. He made himself master of all that quarter
10 of the globe, and reigned over it in Babylon, till he brought himself to an early grave by the excesses into which his boundless prosperity allured him. His fame rests on his triumphant success in building up for himself so vast an empire, and the
15 admiration which his career has always excited among mankind is heightened by the consideration of his youth, and of the noble and generous impulses which strongly marked his character.

The Carthaginian hero was Hannibal. We class
20 the Carthaginians among the European nations of antiquity; for, in respect to their origin, their civilization, and all their commercial and political relations, they belonged to the European race, though it is true that their capital was on the
25 African side of the Mediterranean Sea. Hannibal was the great Carthaginian hero. He earned his fame by the energy and implacableness of his hate. The work of his life was to keep a vast empire in a state of continual anxiety and terror for fifty years,
30 so that his claim to greatness and glory rests on the determination, the perseverance, and the success

with which he fulfilled his function of being, while he lived, the terror of the world.

The Roman hero was Caesar. He was born just
35 one hundred years before the Christian era. His renown does not depend, like that of Alexander, on foreign conquests, nor, like that of Hannibal, on the terrible energy of his aggressions upon foreign foes, but upon his protracted and dreadful contests
40 with, and ultimate triumphs over, his rivals and competitors at home. When he appeared upon the stage, the Roman Empire already included nearly all of the world that was worth possessing. There were no more conquests to be made. Caesar did,
45 indeed, enlarge, in some degree, the boundaries of the empire; but the main question in his day was, who should possess the power which preceding conquerors had acquired.

The Roman Empire, as it existed in those
50 days, must not be conceived of by the reader as united together under one compact and consolidated government. It was, on the other hand, a vast congeries of nations, widely dissimilar in every respect from each other, speaking various
55 languages, and having various customs and laws. They were all, however, more or less dependent upon, and connected with, the great central power. Some of these countries were provinces, and were governed by officers appointed and sent out by the
60 authorities at Rome. These governors had to collect the taxes of their provinces, and also to preside over and direct, in many important respects, the administration of justice. They had, accordingly, abundant opportunities to enrich themselves while
65 thus in office, by collecting more money than



Test 3

Questions

they paid over to the government at home, and by taking bribes to favor the rich man's cause in court. Thus the more wealthy and prosperous provinces were objects of great competition among aspirants
70 for office at Rome. Leading men would get these appointments, and, after remaining long enough in their provinces to acquire a fortune, would come back to Rome, and expend it in intrigues and maneuvers to obtain higher offices still.

75 Whenever there was any foreign war to be carried on with a distant nation or tribe, there was always a great eagerness among all the military officers of the state to be appointed to the command. They each felt sure that they should
80 conquer in the contest, and they could enrich themselves still more rapidly by the spoils of victory in war, than by extortion and bribes in the government of a province in peace. Then, besides, a victorious general coming back to Rome always
85 found that his military renown added vastly to his influence and power in the city. He was welcomed with celebrations and triumphs; the people flocked to see him and to shout his praise. He placed his trophies of victory in the temples, and entertained
90 the populace with games and shows, and with combats of gladiators or of wild beasts, which he had brought home with him for this purpose in the train of his army. While he was thus enjoying his triumph, his political enemies would be
95 thrown into the back ground and into the shade; unless, indeed, some one of them might himself be earning the same honors in some other field, to come back in due time, and claim his share of power and celebrity in his turn. In this case,
100 Rome would be sometimes distracted and rent by the conflicts and contentions of military rivals, who had acquired powers too vast for all the civil influences of the Republic to regulate or control.

1

What could be the best title of the passage?

- A) The three greatest ancient nations
- B) The three heroes in the greatest ancient nations
- C) The history of Caesar
- D) How Caesar rose to power

2

According to the passage, why did the author probably mention three heroes?

- A) to talk about their significant differences
- B) to stress the similarity that some nations have
- C) to emphasize the differences between Caesar and the other two heroes
- D) to lead into a more important topic

3

Which of the following is the main difference between Alexander and Hannibal?

- A) Only one of them conquered a vast land area.
- B) Only one of them had to deal mostly with domestic problems rather than having to invade foreign nations.
- C) Only one of them had a horrific image.
- D) They had dissimilar reasons for their conquest.

Questions



Test 3

4

Which of the following is the main difference between Alexander and Caesar?

- A) Only one of them conquered a vast land area.
- B) Only one of them had to deal with more of domestic problems than having to invade foreign nations.
- C) Only one of them had a horrific image.
- D) They had dissimilar reasons for their conquests.

5

According to the passage, of all the differences mentioned, which difference is most outstanding and why?

- A) Alexander's, because he conquered the largest land area.
- B) Hannibal's, because he had the most horrible image of all.
- C) Caesar's, because he was born just one hundred years before the Christian era.
- D) Caesar's, because he was in a significantly different circumstance than the other two who were in a more typical situation.

6

Which of the following is true of the Roman Empire?

- A) Some of the nations in it had political independence.
- B) The central government possessed absolute power in every aspect of life.
- C) Although its nations had many differences, they had one thing in common.
- D) The nations were different from each other in every way except for the central government.

7

As used in line 53, "congeries" most nearly means

- A) aggregate
- B) host
- C) collectivity
- D) congregation

8

According to the passage, in Roman Empire probably who would get the most profit?

- A) the officials in the central government at Rome
- B) the king of each nation conquered by Rome
- C) the governors sent to the provinces by Rome
- D) the officials at Rome bribed by the governors appointed for the conquered nations



Test 3

Questions

9

Which choice gives the best evidence for the answer to the previous question?

- A) “after remaining long enough in their provinces to acquire a fortune,” (Lines 71-72)
- B) “These governors had to collect the taxes of their provinces, and also to preside over and direct, in many important respects, the administration of justice.” (Lines 60-63)
- C) “They were all, however, more or less dependent upon, and connected with, the great central power.” (Lines 56-57)
- D) “they paid over to the government at home, and by taking bribes to favor the rich man’s cause in court.” (Lines 66-67)

10

According to the passage, which of the following is true of victorious generals returning to Rome?

- A) They were welcomed because everyone knew they would try to acquire political power.
- B) Their influence as war generals was surpassed by their role in entertaining the populace.
- C) Most of them showed their strength by fighting with gladiators or with wild beasts.
- D) They considered war a way of gaining wealth.

Questions



Questions 12-20 are based on the following passage.

The raw materials from which the food and tissue-building compounds of plants are synthesized include carbon dioxide, oxygen, water, nitrogen, phosphorus, sulfur, potassium, calcium, magnesium, and iron. The two gases first mentioned are derived directly from the air, through the respiratory organs of the plant. Water is taken into the plant chiefly from the soil, through its fibrous roots. All the other elements in the list are taken from the soil, nitrogen being derived from decaying organic matter (the original source of the nitrogen is, however, the atmosphere, from which the initial supply of nitrogen is obtained by direct assimilation by certain bacteria and perhaps other low forms of plant life), and the remaining ones from the mineral compounds of the soil.

Carbon dioxide and oxygen, being derived from the air, are always available to the leaves and stems of growing plants in unlimited supply; but the supply available to a seed when germinating in the soil, or to the roots of a growing farm crop, may sometimes become inadequate, especially in soils of a very compact texture, or “water-logged” soils. In such cases, the deficiency of these gaseous food elements may become a limiting factor in plant growth.

Water is often a limiting factor in plant growth. Experiments which have been repeated many times and under widely varying conditions show that when water is supplied to a plant in varying amounts, by increasing the percentage of water in the soil in which the plant is growing by regular increments up to the saturation point, the growth of the plant, or yield of the crop, increases up to a certain point and then falls off because the excess of water reduces the supply of air which is available to the plant roots. Hence, abundance of water is, in general, a most essential factor in plant growth.

Under normal conditions of air and moisture supply, however, the plant food elements which may be considered to be the limiting factors in the nutrition and growth of plants are the chemical elements mentioned in the list above.

The plant food materials which are taken from the soil by a growing plant must enter it by osmosis through the semi-permeable membranes which constitute the epidermis of the root-hairs, and circulate through the plant either carried in solution in the sap or by osmosis from cell to cell. Hence, they must be in water-soluble form before they can be utilized by plants. Obviously, therefore, only those compounds of these elements in the soil which are soluble in the soil water are available as plant food. The greater proportion of the soil elements are present there in the form of compounds which are so slightly soluble in water as to be unavailable to plants. The processes by which these practically insoluble compounds become gradually changed into soluble forms are chiefly the “weathering” action of air and water (particularly if the latter contains carbonic acid) and the action of the organic acids resulting from decaying animal or vegetable matter or secreted by living plants.



Test 3

Questions

11

What would be the best title of the passage?

- A) Diverse chemical elements comprising plant food
- B) Sources of plant food elements
- C) Plant food elements
- D) Indispensable chemical elements in plant growth

which cannot be one of the 'chemical elements'.

12

Why were different chemical elements mentioned in the first paragraph?

- A) to show the variety involved
- B) to demonstrate the similarities between them
- C) to delve into some biological differences
- D) to establish some foundation for classification

13

What is the role of the second paragraph in connection to the first one?

- A) cause and effect
- B) specification
- C) exemplification
- D) comparison and contrast

14

According to the passage, which of the following is true of oxygen and water?

- A) They come from the same source.
- B) They function in practically the same fashion.
- C) They might have different availability.
- D) Too much of either can work against the growth of a plant.

15

Which of the following is the most direct evidence for the answer to the previous question?

- A) limiting factor
- B) in varying amounts
- C) always available
- D) reduces the supply of air

16

According to the passage, which of the following is the most unique feature of water in plant growth?

- A) It is a constant limiting factor.
- B) It inhibits the increment pattern of plant growth.
- C) Its amount must vary to fit the needs of plant growth.
- D) The efficiency of its role has to do with other essential element.

Questions



Test 3

17

What would be the most probable reason the author said “however” (Line 12)?

- A) because there are many limiting factors
- B) because the definition of certain elements is dictated by some surrounding conditions
- C) because the author didn’t like the way the previous paragraph ends
- D) because water is not the most important limiting factor

18

Which of the following is the most direct evidence for the answer to the previous question?

- A) limiting factor
- B) in varying amounts
- C) always available
- D) under normal conditions

19

Why did the author mention “osmosis” (Line 51)?

- A) to show one of many possible ways for nutrients to be absorbed into plants
- B) to set up a criterion by which to improve efficiency
- C) to talk about availability and limitation of a certain intake, which provides a criterion for classifying plant foods
- D) to show how insoluble some elements in water are, the solubility of which gives a significant ingredient of plant food classification

20

What is the role of the last paragraph in the passage as a whole?

- A) a solution to the problem presented by the passage
- B) a very cautious conclusion
- C) a decent elaboration of a concept proposed in the rest of the passage
- D) adding a new perspective to the previous discussion



Test 3

Questions

Questions

Questions 21-30 are based on the following passage.

The appearances in the heavens have from earliest historic ages filled men with wonder and awe; then they gradually became a source of questioning, and thinkers sought for explanations of the daily and nightly phenomena of sun, moon and stars. Scientific astronomy, however, was an impossibility until an exact system of chronology was devised. Meanwhile men puzzled over the shape of the earth, its position in the universe, what the stars were and why the positions of some shifted, and what those fiery comets were that now and again appeared and struck terror to their hearts. In answer to such questions, the Chaldean thinkers, slightly before the rise of the Greek schools of philosophy, developed the idea of the seven heavens in their crystalline spheres encircling the earth as their center. This conception seems to lie back of both the later Egyptian and Hebraic cosmologies, as well as of the Ptolemaic. Through the visits of Greek philosophers to Egyptian shores this conception helped to shape Greek thought and so indirectly affected western civilization. Thus our heritage in astronomical thought, as in many other lines, comes from the Greeks and the Romans reaching Europe (in part through Arabia and Spain), where it was shaped by the influence of the schools down to the close of the Middle Ages when men began anew to withstand authority in behalf of observation and were not afraid to follow whither their reason led them. But not all Greek philosophers, it seems, either knew or accepted the Babylonian cosmology. According to Plutarch, though Thales (640?-546? B.C.) and later the Stoics believed the earth to be spherical in form, Anaximander (610-546? B.C.) thought it to be like a "smooth stony pillar," Anaximenes (6th cent.) like a "table." Beginning with the followers of Thales or perhaps Parmenides (?-500 B.C.), as Diogenes Laërtius claims, a long line of Greek thinkers including Plato (428?-347? B.C.) and Aristotle (384-322 B.C.) placed the earth in the center of the universe. Whether Plato held that the earth "encircled" or "clung" around the axis is a disputed point; but Aristotle claimed it was the fixed and immovable center around which

swung the spherical universe with its heaven of fixed stars and its seven concentric circles of the planets kept in their places by their transparent crystalline spheres. The stars were an even greater problem. Anaximenes thought they were "fastened like nails" in a crystalline firmament, and others thought them to be "fiery plates of gold resembling pictures." But if the heavens were solid, how could the brief presence of a comet be explained? Among the philosophers were some noted as mathematicians whose leader was Pythagoras (c. 550 B.C.). He and at least one of the members of his school, Eudoxus (409?-356? B.C.), had visited Egypt, according to Diogenes Laërtius, and had in all probability been much interested in and influenced by the astronomical observations made by the Egyptian priests. On the same authority, Pythagoras was the first to declare the earth was round and to discuss the antipodes. He too emphasized the beauty and perfection of the circle and of the sphere in geometry, forms which became fixed for 2000 years as the fittest representations of the perfection of the heavenly bodies. There was some discussion in Diogenes' time as to the author of the theory of the earth's motion of axial rotation. Diogenes gives the honor to Philolaus (5th cent. B.C.) one of the Pythagoreans, though he adds that others attribute it to Ictetas of Syracuse (6th or 5th cent. B.C.). Cicero, however, states the position of Hicetas of Syracuse as a belief in the absolute fixedness of all the heavenly bodies except the earth, which alone moves in the whole universe, and that its rapid revolutions upon its own axis cause the heavens apparently to move and the earth to stand still. Other thinkers of Syracuse may also have felt the Egyptian influence; for one of the greatest of them, Archimedes (c. 287-212 B.C.), stated the theory of the earth's revolution around the sun as enunciated by Aristarchus of Samos. (Perhaps this is the "hearth-fire of the universe" around which Philolaus imagined the earth to whirl.) In Arenarius, a curious study on the possibility of expressing infinite sums by numerical denominations as in counting the sands of the universe, Archimedes writes: "For you have known that the universe is called a sphere by several astrologers, its center the center of the earth, and its radius equal to a line drawn from the



Test 3

center of the sun to the center of the earth. This
95 was written for the unlearned, as you have known
from the astrologers...

21

What would be the best title of the passage?

- A) Astrological developments in ancient times
- B) The development of astronomical thought
- C) How Plato affected modern astronomy
- D) The way Greek philosophers influenced modern science

22

What is the organization of the first sentence of the passage?

- A) generalization and specification
- B) comparison and contrast
- C) cause and effect
- D) transition in perspective

23

According to the passage, what was Greek philosophers' attitude toward Babylonian cosmology?

- A) A few of them were not interested.
- B) Some of them didn't try hard enough to truly comprehend it.
- C) Some of them appeared not to agree with it.
- D) Its conceptualization was particularly difficult for them to grasp.



Test 3

Questions

24

In context, which of the following is most probably the reason the Chaldean thinkers developed a multiple heaven theory?

- A) because they did not know how to time certain astronomical events
- B) because it was the best way for them to overcome their terror
- C) because they had to answer some of their questions properly
- D) because some horrible heavenly objects kept reappearing

25

Which choice gives the best evidence for the answer to the previous question?

- A) "This conception seems to lie back of both the later Egyptian and Hebraic cosmologies, as well as of the Ptolemaic." (Lines 17-19)
- B) "Scientific astronomy, however, was an impossibility until an exact system of chronology was devised." (Lines 6-8)
- C) "Meanwhile men puzzled over the shape of the earth, its position in the universe, what the stars were and why the positions of some shifted, and what those fiery comets were that now and again appeared and struck terror to their hearts" (Lines 8-13)
- D) "Through the visits of Greek philosophers to Egyptian shores this conception helped to shape Greek thought and so indirectly affected western civilization." (Lines 19-23)

26

Which of the following is true of Babylonian cosmology?

- A) At the time of its inception it was less scientific than other approaches.
- B) It had an influence far beyond the realm of scientific curiosity
- C) It served as the foundation of Western civilization.
- D) It was difficult for outsiders to understand, leading many to misunderstand it.

27

Which of the following gives the most direct evidence for the answer to the previous question?

- A) not all Greek philosophers
- B) so indirectly affected western civilization
- C) men began anew to withstand authority
- D) spherical in form

28

According to the passage, which of the following is probably the reason stars were bigger problems?

- A) because they were obviously much greater in number than the earth
- B) because their movements were more complicated than that of the earth
- C) because of an unexplainable anomaly
- D) because there was a big conflict between astronomy and mathematics

Questions



29

Which of the following gives the most direct evidence for the answer to the previous question?

- A) “Pythagoras was the first to declare the earth was round” (Lines 63-64)
- B) “the fittest representations of the perfection of the heavenly bodies.” (Lines 67-68)
- C) “how could the brief presence of a comet be explained?” (Lines 53-54)
- D) “Cicero, however, states the position of Hicetas of Syracuse as a belief in the absolute fixedness of all the heavenly bodies except the earth,” (Lines 74-77)

30

Which of the following most directly shows the same attitude as displayed by enunciator?

- A) Egyptian influence
- B) curious
- C) revolutions
- D) the unlearned

31

Which of the following is not the strategy the author is using to convey his or her argument in the passage?

- A) generalization and specification
- B) comparison and contrast
- C) cause and effect
- D) exception and refutation



Test 3

Questions 32-41 are based on the following passage.

Electricity, next to Deity, is the most remarkable entity in the universe. Its marvelous and varied powers and utilities create a new epoch in scientific thought and discovery. Its study is
5 replete with new and fascinating ideas and scientific theories. It contains the story of the universe more sublime than an epic, more wonderful than a romance. It organized the machinery of the worlds, and holds the secrets of nature and the mysteries
10 of life in its invisible grasp. Electricity is the right hand of Deity, the tongue of the Spirit, the Word of Omnipotent power, the protean cosmic force and creative machinery of the universe. At the divine fiat it seized all atoms and space, it shook
15 the ether into nebula, the nebula into worlds, the worlds into constellations, the constellations into a universe. It shaped planets and rounded suns and hurled them forth to circle in the chorus of the singing spheres. It gave form and functions to
20 all matter from the rounded pebble to the stars; from the raindrop to the surging seas; from the chirping cricket to the sporting leviathan; from the helpless infant to the giant man. It is the messenger and executive of Creative Will to all
25 created things. It is the ambassador of spirit to matter, the autocrat of communication between all the faculties of mind and all the functions of physical existence. It is the law of affinity in matter, of selection in atoms, and whispers to the body
30 the intuitions of the Spirit and guides insensate worlds to do the will of Creative Omnipotence. Electricity is the wonderful medium and agent by which mind acts upon matter and works the miracle of life and growth. This mightiest servant
35 of God and man, this genii greater than Aladdin's lamp, impresses all laws upon nature, and makes the universe obedient to the will of Deity, as man's body is obedient to the dictates of man's mind. This inscrutable word of power from the source of
40 all power is beginning to supply the human race with an inexhaustible force that will revolutionize the earth and link all nations together as one family in a millennium of peace and good will. Human life seems to throb, pulsate, gleam and
45 glow in this marvelous current of existence, which

causes illumination, transportation, telegraphy, photography, surgery, horticulture, agriculture, metallurgy and manufacture to step forth as master magicians to work miracles for the comfort and
50 happiness of mankind. Every new discovery, every step in the progress of electrical science conquers time, destroys distances, diffuses knowledge, dissipates ignorance, encourages friendship and draws men and nations closer and closer by
55 physical ties and spiritual affinities. Where once noisy ponderous mechanism pounded the rocks to release the metals, electrical science with her unseen but resistless currents instantly separate the ore and the dross. Where the soot-begrimed
60 engineer seizes the heavy iron throttle, she cleanly and softly touches a tiny button and the miracle is wrought—the heavy steed of steel receives its life not from smoking, hissing, fussing steam, but from an energy as silent as light and as potent
65 as Omnipotence. This invisible electrical energy, without brush or color, paints the gorgeous beauties of the rainbow, and photographs in every ray of light and on every human eye the moving panorama of every passing scene. It telegraphs
70 between mind and matter, between soul and body, between suns and planets, and gives life and energy to all the varied functions of this electric magnetic universe. This strange, miraculous power has taken its place as the supreme force of all forces,
75 the ultimate elemental force from which all other physical forces are derived, and, without fuel or expense, flies with its burdens swifter than the flight of eagles. It is the last and greatest progeny of man genius and discovery, the seventh daughter
80 of science, who dips her wand in the impossible and miraculous until miracles become prolific and common. Its power and expression are universal and its character and process superlatively grand. Its theatre of action is the universe and it comes
85 to earth as the voice of Deity and the word of His Omnipotence. This science of the impossible, this daughter of miracles, is destined to outstrip all past achievements. The ponderous and noisy mechanisms will pass away, the barren rocks will
90 change into most precious things, the sunlight will be converted into reservoirs of power, and every raindrop and waterfall, ocean tide and wind current, will reveal exhaustless sources of wealth and energy.

Questions

Questions



Test 3

32

What would be the best title of the passage?

- A) The practical uses of electricity
- B) What electricity can and cannot do
- C) The miraculous and ambivalent power of electricity
- D) An incredible agent in the Universe

33

According to the passage, what can be said about electricity?

- A) There will be no scientific outcome greater than that of electricity.
- B) Its influence is as great as that of God.
- C) It is the earliest and most significant scientific discovery.
- D) It and God play complementary roles in human history.

34

Which of the following is the best interpretation of the author's attitude toward electricity?

- A) overwhelmed
- B) exhilarated
- C) overzealous
- D) detached

35

Which of the following gives the least evidence for the answer to the previous question?

- A) "This strange, miraculous power...the flight of eagles." (Lines 73-78)
- B) "This mightiest servant...to the will of Deity," (Lines 34-37)
- C) "Every new discovery...physical ties and spiritual affinities." (Lines 50-55)
- D) "Electricity, next to Deity, is the most remarkable entity in the universe." (Lines 1-2)

36

According to the context, what does the author most likely mean by mind acts upon matter?

- A) Mind produces changes in the states of matter.
- B) People employ mind to create useful things from matter.
- C) Some people take advantage of matter with a mind to do things that would be totally incredible or impossible without God's help.
- D) Mind can work wonders, sometimes even in the realm of the gods.



Test 3

Questions

37

According to the passage, which of the following is NOT true of electricity?

- A) It must be the most integral element that God works with.
- B) It is the most important tool used by God to govern the Universe.
- C) It serves God, but not man.
- D) Without it, it might be hard for mind to act upon matter.

38

As used in line 39, “inscrutable” most likely means

- A) mysterious
- B) splendid
- C) docile
- D) devine

39

Which of the following is mostly likely the role of “current” (Line 45)?

- A) irony
- B) sarcasm
- C) metaphor
- D) duality

40

If turned out to be true, which of the following would most directly undermine the author’s argument?

- A) Electricity is absolutely essential for the development of any inventions, in the future, near or distant.
- B) Because of the many advances in electrical science and engineering, weapons have become more sophisticated and deadly.
- C) Some people are hardcore atheists while others are uncommitted agnostics.
- D) Some countries are not advanced enough to take full advantage of the advances in electrical science.

41

Which of the following gives the best evidence for the answer to the previous question?

- A) “This mightiest servant...the will of Deity,” (Lines 34-37)
- B) “an inexhaustible force...and good will.” (Lines 41-43)
- C) “Human life seems..., metallurgy and manufacture” (Lines 44-48)
- D) “the heavy steed...potent as Omnipotence.” (Lines 62-65)

Questions



Test 3

Questions 42-51 are based on the following passage.

As happens in all the sciences in which Geometry is applied to matter, the demonstrations concerning Optics are founded on truths drawn from experience. Such are that the rays of light
5 are propagated in straight lines; that the angles of reflexion and of incidence are equal; and that in refraction the ray is bent according to the law of sines, now so well known, and which is no less certain than the preceding laws. The majority
10 of those who have written touching the various parts of Optics have contented themselves with presuming these truths. But some, more inquiring, have desired to investigate the origin and the causes, considering these to be in themselves
15 wonderful effects of Nature. In which they advanced some ingenious things, but not however such that the most intelligent folk do not wish for better and more satisfactory explanations. Wherefore I here desire to propound what I have
20 meditated on the subject, so as to contribute as much as I can to the explanation of this department of Natural Science, which, not without reason, is reputed to be one of its most difficult parts. I recognize myself to be much indebted
25 to those who were the first to begin to dissipate the strange obscurity in which these things were enveloped, and to give us hope that they might be explained by intelligible reasoning. But, on the other hand I am astonished also that even here
30 these have often been willing to offer, as assured and demonstrative, reasonings which were far from conclusive. For I do not find that any one has yet given a probable explanation of the first and most notable phenomena of light, namely why it is
35 not propagated except in straight lines, and how visible rays, coming from an infinitude of diverse places, cross one another without hindering one another in any way. I shall therefore essay in this book, to give, in accordance with the principles
40 accepted in the Philosophy of the present day, some clearer and more probable reasons, firstly of these properties of light propagated rectilinearly; secondly of light which is reflected on meeting other bodies. Then I shall explain the phenomena
45 of those rays which are said to suffer refraction on

passing through transparent bodies of different sorts; and in this part I shall also explain the effects of the refraction of the air by the different densities of the Atmosphere. Thereafter I shall examine the
50 causes of the strange refraction of a certain kind of Crystal which is brought from Iceland. And finally I shall treat of the various shapes of transparent and reflecting bodies by which rays are collected at a point or are turned aside in various ways. From
55 this it will be seen with what facility, following our new Theory, we find not only the Ellipses, Hyperbolas, and other curves which Mr. Des Cartes has ingeniously invented for this purpose; but also those which the surface of a glass lens
60 ought to possess when its other surface is given as spherical or plane, or of any other figure that may be. It is inconceivable to doubt that light consists in the motion of some sort of matter. For whether one considers its production, one sees that here
65 upon the Earth it is chiefly engendered by fire and flame which contain without doubt bodies that are in rapid motion, since they dissolve and melt many other bodies, even the most solid; or whether one considers its effects, one sees that when light is
70 collected, as by concave mirrors, it has the property of burning as a fire does, that is to say it disunites the particles of bodies. This is assuredly the mark of motion, at least in the true Philosophy, in which one conceives the causes of all natural effects in
75 terms of mechanical motions. This, in my opinion, we must necessarily do, or else renounce all hopes of ever comprehending anything in Physics. And as, according to this Philosophy, one holds as certain that the sensation of sight is excited only
80 by the impression of some movement of a kind of matter which acts on the nerves at the back of our eyes, there is here yet one reason more for believing that light consists in a movement of the matter which exists between us and the luminous body.



Test 3

Questions

42

What could be the best title of the passage?

- A) The physical characteristics of rays
- B) The reason for which rays move rectilinearly
- C) The significance of the rectilinear motion of rays
- D) Certain traits of light
- E) The importance of matter in the movement of light

43

According to the passage, in which aspect of light is the author most interested in?

- A) that it needs matter to propagate
- B) what happens when it propagates
- C) that the rules of Geometry govern its movement
- D) that studying it has led to improvements in the field of Optics

44

What is the author's general attitude?

- A) inquisitive
- B) subjective
- C) authoritative
- D) qualified

45

According to the author, what is the connection between "light" and "matter"?

- A) irrelevant
- B) inclusive
- C) unclear
- D) inseparable

46

According to the passage, which of the following is a case in which exploring physics would become futile?

- A) when physicists lose hope
- B) when it is not possible to explain any natural effect using physical movements
- C) when excited light possesses traits similar to fire
- D) when collecting light using a concave mirror no longer exhibits the property of burning fire

47

Which of the following gives the best evidence for the answer to the previous question?

- A) "one considers its effects...the particles of bodies." (Lines 68-72)
- B) "the sensation of sight...at the back of our eyes," (Lines 79-82)
- C) "in which one conceives...mechanical motions." (Lines 73-75)
- D) "This, in my opinion,...in Physics." (Lines 75-77)

Questions



Test 3

48

According to the passage, which choice can be logically added to the end of the passage?

- A) a wider varieties of light motions
- B) a wider varieties of light
- C) a way to corroborate the author's argument
- D) a way to refute a possible counterargument against the author's

49

Which choice would the author be most likely to agree with?

- A) Light must be some kind of matter.
- B) Without matter, light cannot exist.
- C) A light source must exist as a form of matter.
- D) Matter is the cause of light.

50

According to the passage, why did the author probably mention the connection between Optics and experience along with the connection between Geometry and matter?

- A) in order to introduce a more detailed topic
- B) in order to introduce the connection between Optics and matter
- C) in order to talk about how Optics was invented
- D) in order to establish some background for a further explanation of why light must move through matter

51

Which choice gives the best evidence for the answer to the previous question?

- A) "the ray is bent according to the law of sines," (Lines 7-8)
- B) "it is not propagated except in straight lines," (Lines 34-35)
- C) "light which is reflected on meeting other bodies." (Lines 43-44)
- D) "majority of those who have written touching the various parts of Optics have contented themselves with presuming these truths." (Lines 9-12)

STOP