Part 1

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Part 2

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Part 9

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Chapter 16

Practice Exam 1

● ●

*T*his sample test features nine subtests, just like the actual ASVAB. As you may have guessed, the sample tests in this book are paper-based tests. (Yes, we're the masters of the obvious.) When you take the actual ASVAB, it may be a paper-based or a computer-based exam. The computer version follows the same format as the paper version. (Check out the computer-based test in greater detail in Chapter 3.) The only real differences are that on the computer-based test, you can't skip a question and go back to it, and you can't change an answer after you enter it into the computer.

To get the most out of this sample test, take it like you'd take the real ASVAB under the same conditions:

1. **Allow yourself about three hours to take the entire exam, and take the whole thing at one time.**

2. **Find a quiet place where you won't be interrupted.**

3. **Bring a timer that you can set for various lengths of time, some scratch paper, and a pencil.**

4. **At the start of each subtest, set your timer for the specified period of time.**

   Don't go on to the next section until the timer has gone off, and don't go back to a previous section. If you finish early, check your work for that section only.

5. **Use the answer sheet that's provided.**

6. **Don't take a break during any subtest.**

   You can take a short one- or two-minute break between subtests if you need it.

After you complete the entire sample test, check your answers against the answer key in Chapter 17. Remember that the test is scored by comparing your raw score to the scores of other people, which produces a scaled score. So just because you missed a total of 20 questions doesn't mean that your score is 80 (that would be too simple). Turn to Chapter 1 to find out how the ASVAB is scored.

Your primary goal with this sample test is to determine your strengths and weaknesses. If you only miss one question on the Word Knowledge subtest but you miss 15 on Arithmetic Reasoning, you know where to spend your study time. If you're not going to pursue a career that requires a score on a particular subtest or the type of knowledge a subtest covers, don't worry about your score. (See the Appendix for more information on the subtests various careers require good scores on.) Go ahead and take the sample test like it's the actual ASVAB, but don't worry about your score.

Part 1

General Science

> Time: 11 minutes; 25 Questions
>
> **Directions**
>
> This section tests your knowledge of general science principles usually covered in high-school classes. Pick the best answer for each question and then mark the space on your answer sheet that corresponds to the question number and the letter indicating your choice.

1. A series of cell divisions that results in the formation of an embryo is called:

   (A) mitosis

   (B) meiosis

   (C) osmosis

   (D) cleavage

2. An animal that eats only plants is called a(n):

   (A) omnivore

   (B) herbivore

   (C) carnivore

   (D) voracious

3. The process by which energy is provided at the cellular level is called:

   (A) respiration

   (B) recreation

   (C) oxidation

   (D) metabolism

4. All of the following are domains except:

   (A) Regelia

   (B) Eukarya

   (C) Bacteria

   (D) Archaea

5. Light waves travel at a rate of about:

   (A) 186,000 miles per hour

   (B) 186,000 miles per minute

   (C) 18,600 miles per hour

   (D) 186,000 miles per second

6. The largest moon in the solar system is:

   (A) Ganymede

   (B) Titan

   (C) Io

   (D) Charon

7. The spinal cord is part of the:

   (A) circulatory system

   (B) nervous system

   (C) respiratory system

   (D) digestive system

8. Joints that hold bones firmly together are called:

   (A) hinge joints

   (B) ball and socket joints

   (C) fixed joints

   (D) pivot joints

9. The top or broadest level of the classification system for living organisms is called:

   (A) class

   (B) phylum

   (C) kingdom

   (D) genus

10. If there are two full moons in a single month, the second full moon is called:

    (A) new moon

    (B) full moon

    (C) blue moon

    (D) secondary moon

11. The brainstem connects the brain to the:

(A) heart

(B) lungs

(C) neck

(D) spinal cord

12. Red blood cells:

(A) produce antibodies

(B) fight infections

(C) carry oxygen and carbon dioxide

(D) are few in number

13. Protein can be found in all of the following foods EXCEPT:

(A) eggs

(B) meat

(C) peas

(D) apples

14. Which inorganic substance is present in the greatest quantity inside animal cells?

(A) protein

(B) oxygen

(C) sodium chloride

(D) water

15. Cell protoplasm is made up mostly of:

(A) water

(B) oxygen

(C) sugar

(D) protein

16. A meter consists of:

(A) 10 centimeters

(B) 100 millimeters

(C) 100 centimeters

(D) 10 millimeters

17. It's impossible for the sun to turn into a black hole because:

(A) it's too large

(B) it's too small

(C) it's a yellow star

(D) it has planets

18. Electrons are particles that are:

(A) positively charged

(B) neutral

(C) able to move freely

(D) negatively charged

19. The chamber of the heart that pumps blood to the lungs is called the:

(A) right ventricle

(B) left ventricle

(C) right atrium

(D) left atrium

20. The atomic number of an atom is determined by:

(A) the size of its nucleus

(B) the number of protons

(C) the number of electrons

(D) its location in the periodic table

21. The smallest part of an element that still acts like an element is:

(A) the nucleus

(B) a compound

(C) the element itself

(D) the atom

22. How many planets in the solar system have rings?

(A) one

(B) two

(C) three

(D) four

23. The temperature at which a solid becomes a liquid is its:

(A) melting point

(B) boiling point

(C) freezing point

(D) concentration point

24. The surface of the earth is called the:
    (A) mantle
    (B) core
    (C) shawl
    (D) crust

25. Not counting the sun, the closest star to the Earth is:
    (A) Rigel
    (B) Proxima Centauri
    (C) Antares
    (D) Betel

STOP   **DO NOT TURN THE PAGE UNTIL TOLD TO DO SO.**

Part 2

Arithmetic Reasoning

Time: 36 minutes; 30 questions

Directions

This test contains questions about arithmetic. Each question is followed by four possible answers. Decide which answer is correct and then mark the space on your answer sheet that has the same number and letter as your choice. Use scratch paper for any figuring you wish to do.

1. If a car is towed 12 miles to the repair shop, and the tow charge is $3.50 per mile, how much did the tow cost?

   (A) $12.00

   (B) $3.50

   (C) $42.00

   (D) $100.00

2. The sum of two numbers is 70. One number is 8 more than the other. What's the smaller number?

   (A) 31

   (B) 33

   (C) 35

   (D) 36

3. A sales manager buys antacid in bottles by the gross. If he goes through 3 bottles of antacid every day, how long will the gross last?

   (A) 144 days

   (B) 3 days

   (C) 20 days

   (D) 48 days

4. Jenny's test grades are 93, 89, 96, and 98. If she wishes to raise her average to 95, what does she need to score on her next test?

   (A) 100

   (B) 99

   (C) 97

   (D) 95

5. A waitress earns an average tip of 12% of the cost of the food she serves. If she serves $375 worth of food in one evening, how much money in tips will she earn on average?

   (A) $37

   (B) $45

   (C) $42

   (D) $420

6. How many square feet of carpeting are needed to carpet a 12-foot x 12-foot room?

   (A) 24

   (B) 120

   (C) 48

   (D) 144

7. Carpet stain protector costs $0.65 per square yard to apply. How much will it cost to apply the protectant to a 16-foot x 18-foot carpet?

   (A) $187.20

   (B) $62.40

   (C) $20.80

   (D) $96.00

8. A printing plant that produces baseball cards has a monthly overhead of $6,000. It costs 18 cents to print each card, and the cards sell for 30 cents each. How many cards must the printing plant sell each month in order to make a profit?

   (A) 30,000

   (B) 40,000

   (C) 50,000

   (D) 60,000

9. Joe received an hourly wage of $8.15. His boss gave him a 7% raise. How much does Joe make per hour now?

    (A) $0.57

    (B) $8.90

    (C) $8.72

    (D) $13.85

10. Alice leaves her house, driving east at 45 miles per hour (mph). Thirty minutes later, her husband Dave notices she forgot her cell phone and sets off after her. How fast must Dave travel in order to catch up with Alice 3 hours after he leaves?

    (A) 49 mph

    (B) 50.5 mph

    (C) 52.5 mph

    (D) 54 mph

11. A baker made 20 pies. A Boy Scout troop buys one-fourth of his pies, a preschool teacher buys one-third of his pies, and a caterer buys one-sixth of his pies. How many pies does the baker have left?

    (A) ¾

    (B) 15

    (C) 12

    (D) 5

12. Miriam bought five cases of motor oil on sale. A case of motor oil normally costs $24.00, but she was able to purchase the oil for $22.50 a case. How much money did Miriam save on her entire purchase?

    (A) $7.50

    (B) $1.50

    (C) $8.00

    (D) $22.50

13. A security guard walks the equivalent of six city blocks when he makes a circuit around the building. If he walks at a pace of eight city blocks every 30 minutes, how long will it take him to complete a circuit around the building, assuming he doesn't run into any thieves?

    (A) 20.00 minutes

    (B) 3.75 minutes

    (C) 22.50 minutes

    (D) 24.00 minutes

14. The population of Grand Island, Nebraska, grew by 600,000 people between 1995 and 2005, one-fifth more than the town council predicted. The town council originally predicted the city's population would grow by:

    (A) 400,000

    (B) 500,000

    (C) 300,000

    (D) 200,000

15. Joan is taking an admissions examination. If she has to get at least 40 of the 60 questions right to pass, what percent of the questions does she need to answer correctly?

    (A) 30%

    (B) 40%

    (C) 66⅓%

    (D) 66⅔%

16. A teacher deposited $3,000 in a retirement fund. If she didn't add any more money to the fund, which earns an annual interest rate of 6%, how much money would she have in 1 year?

    (A) $180

    (B) $3,006

    (C) $3,180

    (D) $6,000

17. The high-school track measures one quarter of a mile around. How many laps would you have to run in order to run three and a half miles?

    (A) 12

    (B) 14

    (C) 16

    (D) 18

18. Karl is driving in Austria, where the speed limit is posted in kilometers per hour. The car's speedometer shows that he's traveling at a rate of 75 kilometers per hour. Karl knows that a kilometer is about ⅝ of a mile. Approximately how many miles per hour is Karl traveling?

    (A) 47

    (B) 120

    (C) 50

    (D) 53

19. A carpenter earns $12.30 an hour for a 40-hour week. His overtime pay is 1½ times his base pay. If he puts in a 46-hour week, how much is his weekly pay?

    (A) $602.70

    (B) $492.00

    (C) $565.80

    (D) $110.70

20. An office building has 30 employees and allows 42 square feet of work space per employee. If five more employees are hired, how much less work space will each employee have?

    (A) 6 square feet

    (B) 7 square feet

    (C) 7.5 square feet

    (D) 8 square feet

21. Stan bought a monster truck for $2,000 down and payments of $450 a month for five years. What's the total cost of the monster truck?

    (A) $4,250

    (B) $29,000

    (C) $27,000

    (D) $34,400

22. Darla spent $120.37 on groceries in January, $108.45 in February, and $114.86 in March. What was the average monthly cost of Darla's groceries?

    (A) $343.68

    (B) $110.45

    (C) $114.86

    (D) $114.56

23. Keith is driving from Reno to Kansas City to meet his girlfriend. The distance between the two cities is 1,650 miles. If Keith can average 50 miles per hour, how many hours will it take him to complete his trip?

    (A) 8 hours

    (B) 30 hours

    (C) 33 hours

    (D) 82 hours

24. Michael needs 55 gallons of paint to paint an apartment building. He would like to purchase the paint for the least amount of money possible. Which of the following should he buy?

    (A) two 25-gallon buckets at $550 each

    (B) eleven 5-gallon buckets at $108 each

    (C) six 10-gallon buckets at $215 each

    (D) fifty-five 1-gallon buckets at $23 each

25. As a member of FEMA, you're required to set up a contingency plan to supply meals to residents of a town devastated by a tornado. A breakfast ration weighs 12 ounces and the lunch and dinner rations weigh 18 ounces each. Assuming a food truck can carry 3 tons and that each resident will receive 3 meals per day, how many residents can you feed from one truck during a 10-day period?

    (A) 150 residents

    (B) 200 residents

    (C) 250 residents

    (D) 300 residents

26. A train headed south for Wichita left the station at the same time a train headed north for Des Moines left the same station. The train headed for Wichita traveled at 55 miles per hour. The train headed for Des Moines traveled at 70 miles per hour. How many miles apart were the trains at the end of 3 hours?

    (A) 210 miles

    (B) 165 miles

    (C) 125 miles

    (D) 375 miles

27. A carpenter needs to cut four sections, each 3-feet 8-inches long, from a piece of molding. If the board is only sold by the foot, what's the shortest length of board she can buy?

    (A) 15 feet

    (B) 14 feet

    (C) 16 feet

    (D) 12 feet

28. Kiya had a coupon for 10% off one frozen turkey breast. The turkey breasts cost $8.50 each, and Kiya bought two. How much did she pay?

    (A) $16.15

    (B) $17.00

    (C) $15.30

    (D) $7.65

29. A recruiter travels 1,100 miles during a 40-hour workweek. If she spends $\frac{2}{5}$ of her time traveling, how many hours does she spend traveling?

    (A) 22

    (B) 5½

    (C) 16

    (D) 8

30. Your car uses gasoline at the rate of 21 miles per gallon. If gasoline costs $2.82 per gallon, and you drive for 7 hours at a speed of 48 miles per hour, how much will you pay for gasoline for the trip?

    (A) $38.18

    (B) $45.12

    (C) $47.73

    (D) 59.27

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Part 3

Word Knowledge

Time: 11 minutes; 35 questions

Directions

This test is about the meanings of words. Each question has an underlined word. You may be asked to decide which one of the four words in the choices *most nearly means* the same thing as the underlined word or which one of the four words means the opposite. If the underlined word is used in a sentence, decide which of the four choices most nearly means the same thing as the underlined word, as used in the context of the sentence. Mark the corresponding space on your answer sheet.

1. The gold was kept in a <u>secure</u> vault.
   (A) locked
   (B) safe
   (C) unknown
   (D) thick

2. <u>Assimilate</u> most nearly means:
   (A) absorb
   (B) react
   (C) pretend
   (D) lie

3. <u>Theorize</u> most nearly means:
   (A) know
   (B) speculate
   (C) study
   (D) travel

4. <u>Symmetrical</u> most nearly means:
   (A) uplifted
   (B) congruent
   (C) handsome
   (D) positive

5. The exchange student was <u>proficient</u> in French, German, and English.
   (A) poor
   (B) knowledgeable
   (C) adept
   (D) exacting

6. The students were scheduled to observe a <u>plenary</u> session of Congress.
   (A) scheduled
   (B) example
   (C) special
   (D) full

7. He tried to <u>goad</u> his audience.
   (A) insult
   (B) incite
   (C) please
   (D) bore

8. He ran <u>headlong</u> into the fight.
   (A) headfirst
   (B) reluctantly
   (C) happily
   (D) recklessly

9. <u>Flagrant</u> most nearly means:
   (A) quiet
   (B) amazing
   (C) delayed
   (D) glaring

10. The word *most opposite* in meaning to <u>stimulate</u> is:
    (A) support
    (B) arrest
    (C) travel
    (D) dislike

11. Legacy most nearly means:
    (A) history
    (B) bequest
    (C) story
    (D) will

12. The actions of the CEO were unconscionable.
    (A) clever
    (B) illegal
    (C) excessive
    (D) automatic

13. The sergeant gave his reasoned opinion.
    (A) irate
    (B) logical
    (C) impressive
    (D) uninformed

14. Laudable most nearly means:
    (A) loud
    (B) fluid
    (C) commendable
    (D) transparent

15. The brass was burnished.
    (A) yellow
    (B) old
    (C) expensive
    (D) polished

16. The commodity was sold.
    (A) product
    (B) stock
    (C) idea
    (D) table

17. Her motives were oblique.
    (A) pure
    (B) emotional
    (C) obscure
    (D) amusing

18. Superfluous most nearly means:
    (A) superior
    (B) unnecessary
    (C) helpful
    (D) expensive

19. The word *most opposite* in meaning to hypocrisy is:
    (A) honesty
    (B) happy
    (C) angry
    (D) threatening

20. The report indicated a significant hemorrhage of corporate earnings.
    (A) gain
    (B) payout
    (C) trade
    (D) loss

21. The army soldiers were ordered to immediate garrison duty.
    (A) field
    (B) combat
    (C) latrine
    (D) fort

22. Fiscal most nearly means:
    (A) year
    (B) financial
    (C) calendar
    (D) three months

23. Domicile most nearly means:
    (A) office
    (B) domestic
    (C) home
    (D) vacation

24. Abate most nearly means:
    (A) recover
    (B) aid
    (C) foreclose
    (D) end

25. To <u>commission</u> most nearly means:
    (A) to give
    (B) to rescind
    (C) to earn
    (D) to authorize

26. He gave a <u>succinct</u> account of the events.
    (A) passionate
    (B) lengthy
    (C) uncensored
    (D) concise

27. The vote resulted in the <u>demise</u> of the proposed new law.
    (A) passage
    (B) death
    (C) postponement
    (D) abatement

28. The politician exuded <u>charisma</u>.
    (A) odors
    (B) falseness
    (C) charm
    (D) generosity

29. <u>Burrow</u> most nearly means:
    (A) deepen
    (B) hide
    (C) nestle
    (D) jump

30. That custom still <u>prevails</u>.
    (A) angers
    (B) persists
    (C) surprises
    (D) excites

31. <u>Contravene</u> most nearly means:
    (A) invade
    (B) obstruct
    (C) argue
    (D) reverse

32. <u>Chasm</u> most nearly means:
    (A) hole
    (B) sky
    (C) mountain
    (D) valley

33. <u>Fundamental</u> most nearly means:
    (A) radical
    (B) religious
    (C) basic
    (D) excessive

34. <u>Susceptible</u> most nearly means:
    (A) travel
    (B) resistant
    (C) limited
    (D) gullible

35. To <u>emit</u> most nearly means:
    (A) to give off
    (B) to smell
    (C) to contain
    (D) to admit

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Part 4

Paragraph Comprehension

Time: 13 minutes; 15 questions

Directions

This test contains items that measure your ability to understand what you read. This section includes one or more paragraphs of reading material followed by incomplete statements or questions. Read the paragraph and select the choice that best completes the statement or answers the question. Mark your choice on your answer sheet, using the correct letter with each question number.

1. An important stage of personal time management is to take control of appointments. Determined by external obligation, appointments constitute interaction with other people and an agreed-on interface between your activities and those of others. Start with a simple appointment diary. List all appointments including regular and recurring ones. Now, be ruthless and eliminate the unnecessary. There may be committees where you can't productively contribute or where a subordinate may be able to participate. Eliminate the waste of your time.

    Effectively managing your appointments allows you to:

    (A) spend more time with your subordinates

    (B) delegate responsibility to subordinates

    (C) make more efficient use of your time

    (D) attend only the most important meetings

2. The U.S. Congress consists of 100 senators and 435 representatives. Two senators are elected from each state. The number of representatives from each state is based on population, although each state has at least one representative. Senators serve six-year terms and representatives serve two-year terms.

    According to this passage:

    (A) There are an equal number of senators and representatives.

    (B) The number of representatives from each state is decided by a lottery.

    (C) It's possible for a state to have no representatives.

    (D) Senators and representatives have different term lengths.

3. Indo-European languages consist of those languages spoken by most of Europe and in those parts of the world that Europeans have colonized since the 16th century (such as the United States). Indo-European languages are also spoken in India, Iran, parts of western Afghanistan, and in some areas of Asia.

   The author of this passage would agree that:

   (A) Indo-European languages are spoken in areas all over the world.

   (B) Indo-European languages include all the languages spoken in the world.

   (C) Only Europeans speak Indo-European languages.

   (D) Indo-European language speakers can easily understand one another.

4. In privatization, the government relies on the private sector to provide a service. However, the government divests itself of the entire process, including all assets. With privatized functions, the government may specify quality, quantity, and timeliness requirements, but it has no control over the operations of the activity. Also, the government may not be the only customer. Whoever the government chooses to provide the services would likely provide the same services to others.

   This paragraph best supports the statement that:

   (A) The government must closely supervise privatized functions.

   (B) Privatized functions consist of a mixture of government employees, military personnel, and private contractors.

   (C) Privatized functions are those institutions that provide services only to a government agency.

   (D) Privatized functions provide essential services to the government.

5. The success or failure of a conference lies largely with its leader. A leader's zest and enthusiasm must be real, apparent, and contagious. The leader is responsible for getting the ball rolling and making the attendees feel as if the meeting is theirs and its success depends on their participation. A good, thorough introduction helps establish the right climate.

   A good title to this paragraph would be:

   (A) Lead by Example

   (B) The Importance of Proper Introductions

   (C) Leading a Successful Conference

   (D) Conference Participation Basics

6. Cloud seeding is accomplished by dropping particles of dry ice (solid carbon dioxide) from a plane onto super-cooled clouds. This process encourages condensation of water droplets in the clouds, which usually, but not always, results in rain or snow.

   From this passage, it's reasonable to assume that:

   (A) Cloud seeding could be used to end a drought.

   (B) Cloud seeding is prohibitively expensive.

   (C) Cloud seeding is rarely used.

   (D) Cloud seeding can be accomplished by using regular ice.

7. To write or not to write — that is the question. If assigned a writing task, there's no option. However, if someone is looking for a specific answer, find out if they need a short answer or a detailed one. Can the requirement be met with a telephone call, e-mail, or short note, or is something more necessary? A former CEO of a major corporation once commented that he had looked at 13,000 pieces of paper in a 5-day period. Think how much easier and more economical it would be if people would use the telephone, send an e-mail, or write a short note.

The main point of this passage is:

(A) Written records are important as they provide detailed documentation.

(B) More business people should invest time and energy improving their writing skills.

(C) Writing may not be the best way to communicate information.

(D) It's pointless for business people to spend time improving their writing skills.

8. The transistor, a small, solid-state device that can amplify sound, was invented in 1947. At first, it was too expensive and too difficult to produce to be used in cheap, mass-market products. By 1954, though, these cost and production problems had been overcome, and the first transistor radio was put on the market.

According to this passage:

(A) There was no market for transistors before 1954.

(B) When transistors could be produced cheaply and easily, the transistor radio was put on the market.

(C) Transistors were invented in 1947 by order of the Department of Defense.

(D) Transistors are still expensive to produce.

9. I returned from the City about three o'clock on that May afternoon pretty well disgusted with life. I had been three months in the Old Country and was fed up with it. If people had told me a year ago that I would've been feeling like that I should've laughed at them; but there was the fact. The weather made me liverish, the talk of the ordinary Englishman made me sick, I couldn't get enough exercise, and the amusements of London seemed as flat as soda water that had been standing in the sun.

The author is speaking of his travels in:

(A) Spain

(B) Great Britain

(C) Germany

(D) Scotland

10. Surveys show that the average child under the age of 18 watches four hours of television per day. Although some of the programming may be educational, most isn't. Spending this much time watching television interferes with a child's ability to pursue other interests, such as reading, participating in sports, and playing with friends.

The author of this passage would agree that:

(A) Television viewing should be restricted.

(B) Parents who let their children watch this much television are neglectful.

(C) Reading, participating in sports, playing with friends, and watching television should all be given equal time.

(D) Adults over 18 can watch as much television as they want.

Questions 11 and 12 are based on the following passage.

High-school and college graduates attempting to find jobs should participate in mock job interviews. These mock interviews help students prepare for the types of questions they'll be asked, make them more comfortable with common interview formats, and help them critique their performance before facing a real interviewer. Because they're such a valuable aid, schools should organize mock job interviews for all of their graduating students.

11. The above passage states that mock job interviews:

    (A) frighten students

    (B) should be offered to the best students

    (C) help prepare students for real job interviews

    (D) should be organized by students

12. From the above passage, it is reasonable to assume that:

    (A) Mock interviews can increase a student's confidence when he or she goes into a real job interview.

    (B) Mock interviews are expensive to organize.

    (C) Few students are interested in mock interviews.

    (D) Students don't need job interview preparation.

Questions 13 through 15 are based on the following passage.

Due process, the guarantee of fairness in the administration of justice, is part of the 5th Amendment to the U.S. Constitution. The 14th Amendment further requires states to abide by due process. After this amendment was enacted, the U.S. Supreme Court struck down many state laws that infringed on the civil rights guaranteed to citizens in the Bill of Rights.

13. According to the above passage, due process:

    (A) is an outdated concept

    (B) guarantees fairness in the justice system

    (C) never became part of the U.S. Constitution

    (D) is the process by which winning lottery tickets are selected

14. According to the above passage, it's reasonable to assume that the 5th Amendment:

    (A) is about taxes

    (B) guarantees due process in all criminal and civil cases

    (C) guarantees due process in federal law

    (D) should never have become part of the Bill of Rights

15. The author of the above passage would agree that:

    (A) Without the passage of the 14th Amendment, many laws restricting civil rights would still exist in various states.

    (B) The Supreme Court overstepped its jurisdiction when it struck down laws infringing on citizens' civil rights.

    (C) The Supreme Court had every right to strike down state laws before the passage of the 14th Amendment.

    (D) The 14th Amendment was opposed by all states.

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Part 5

Mathematics Knowledge
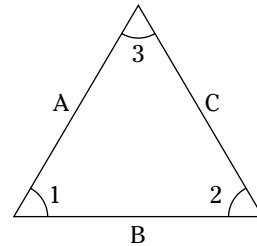
Time: 24 minutes; 25 questions

Directions

This section tests your ability to solve general mathematical problems. Select the correct answer from the choices given, and then mark the corresponding space on your answer sheet. Use scratch paper to do any figuring.
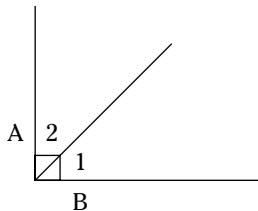
1. If $x = 8$, what's the value of y in the equation $y = (x^2 \div 4) - 2$?

   (A) 14
   (B) 16
   (C) 18
   (D) 20

2. The cube of 5 is:

   (A) 125
   (B) 25
   (C) 15
   (D) 50

3. $2.5 \times 3^3 =$

   (A) 22.5
   (B) 75.0
   (C) 67.5
   (D) 675.0

4. The fourth root of 16 is:

   (A) 4
   (B) 1
   (C) 3
   (D) 2

5. What's the equation of a line that passes through points (0, -1) and (2, 3)?

   (A) $y = 2x - 1$
   (B) $y = 2x + 1$
   (C) $x = 2y - 1$
   (D) $x = 2y + 1$

6. (12 yards + 14 feet) ÷ 5 =

   (A) 12 feet
   (B) 5⅕ feet
   (C) 10 feet
   (D) 2½ yards

7. $x^3 \times x^4 =$

   (A) x^{12}
   (B) $2x^7$
   (C) $2x^{12}$
   (D) x^7

8. $(x + 4)(x + 2) =$

   (A) $x^2 + 6x + 6$
   (B) $x^2 + 8x + 8$
   (C) $x^2 + 8x + 6$
   (D) $x^2 + 6x + 8$

9. $1.5 \times 10^3 =$

   (A) 45
   (B) 150
   (C) 1,500
   (D) 15

10. Which of the following is a prime number?

    (A) 27
    (B) 11
    (C) 8
    (D) 4

11. What's the mode of the following series of numbers? 4 4 8 8 8 10 10 12 12

    (A) 9

    (B) 8

    (C) 11

    (D) 10

12. If $a = 4$, then $a^3 \div a =$

    (A) 4

    (B) 12

    (C) 64

    (D) 16

13. Solve for the factorial of 5 (5!):

    (A) 25

    (B) 125

    (C) 120

    (D) 15

14. $(900 \times 2) \div 6 =$

    (A) 30

    (B) 300

    (C) 150

    (D) 3,000

15. If $x = 2$, then $x^x \times x =$

    (A) 8

    (B) $2x^x$

    (C) 4

    (D) 6

16. If $(5 + 1)(6 \div 3)(8 - 5) = (3 + 3)x$, then $x =$

    (A) 12

    (B) 3

    (C) 4

    (D) 6

17. $\sqrt{49} \times \sqrt{64} =$

    (A) 56

    (B) 15

    (C) 42

    (D) 3,136

18. Which of the following fractions is the largest?

    (A) ⅖

    (B) ⅜

    (C) ⁷⁄₁₀

    (D) ¹³⁄₁₆

19. If $2 + x \geq 4$, what is the value of $x \geq$?

    (A) 6

    (B) 2

    (C) 4

    (D) ½

20. If a circle has a radius of 12 feet, what's its circumference most nearly?

    (A) 24 feet

    (B) 72 feet

    (C) 75 feet

    (D) 36 feet

21. An aquarium measures 16-inches long x 8-inches deep x 18-inches high. What's its volume?

    (A) 2,304 cubic inches

    (B) 128 cubic inches

    (C) 42 cubic inches

    (D) 288 cubic inches

22. Triangle ABC (shown above) is a(n):

    (A) right triangle

    (B) obtuse triangle

    (C) equilateral triangle

    (D) isosceles triangle

Go on to next page

23. The sum of the measures of the angles of a trapezoid is:

    (A) 360 degrees

    (B) 540 degrees

    (C) 180 degrees

    (D) 720 degrees

25. Convert 24% to a fraction.

    (A) ⁶⁄₂₅

    (B) ¹⁄₂₅

    (C) ⁶⁄₂₄

    (D) ¹⁄₂₄

24. In the Angle AB (shown above), Angles 1 and 2 are:

    (A) supplementary

    (B) complimentary

    (C) both obtuse

    (D) both right angles

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Part 6

Electronics Information

Time: 9 minutes; 20 questions

Directions

This test contains questions to challenge your knowledge of electrical, radio, and electronics information. Select the correct response from the choices given and then mark the corresponding space on your answer sheet.

1. Ohm's law states:

   (A) Voltage = Current × Resistance

   (B) Amperes = Current × Resistance

   (C) Voltage = Resistance ÷ Amperes

   (D) Ohms = Voltage ÷ Current

2. An electromagnetic-induction device usually has which of the following materials in its core?

   (A) brass

   (B) silver

   (C) aluminum

   (D) iron

3. How many diodes should you expect to find in a bridge rectifier?

   (A) 0

   (B) 4

   (C) 8

   (D) 10

4. Another name for cycles per second is:

   (A) watts

   (B) voltage

   (C) hertz

   (D) amperes

5. Newer cell phones contain a removable memory card, which is often called a:

   (A) SIM card

   (B) DIM chip

   (C) PIN card

   (D) Pin chip

6. When current flows through a wire, the following influences are present:

   (A) amperes and ohms only

   (B) voltage, watts, and ohms only

   (C) voltage and amperes only

   (D) voltage, ohms, and amperes

7. Millihenries are related to:

   (A) capacitors

   (B) inductors

   (C) relays

   (D) transformers

8. Radar can operate at frequencies as high as:

   (A) 100,000 Hz

   (B) 100,000 kHz

   (C) 100,000 MHz

   (D) 500,000 MHz

9. Radio waves travel:

   (A) at the speed of light

   (B) at the speed of sound

   (C) faster than the speed of light

   (D) faster than the speed of sound but slower than the speed of light

10. Changing alternating current to direct current is called:

    (A) capacitance

    (B) impedance

    (C) rectification

    (D) induction

11. Insulated fittings can be used to splice wires, thus eliminating the need for:

    (A) cleaning the wires

    (B) removing the plastic coating from the wires

    (C) twisting the wires together

    (D) soldering the wires together

12. The symbol shown above stands for:

    (A) battery

    (B) transformer

    (C) capacitor

    (D) resistor

13. How many wires do serial cables used on computers have?

    (A) 3

    (B) 9

    (C) 15

    (D) 25

14. To produce greater storage of electrons and more capacitance, capacitors should:

    (A) be connected in parallel

    (B) be connected in series

    (C) have more voltage applied to them

    (D) be eliminated

15. A light bulb is 60 watts. Operated at 120 volts, how much current does it draw?

    (A) 0.5 ampere

    (B) 5.0 amperes

    (C) 50.0 amperes

    (D) 7,200 amperes

16. A number-12 wire, compared to a number-6 wire:

    (A) is longer

    (B) is shorter

    (C) is smaller in diameter

    (D) is larger in diameter

17. A fuse with a higher-than-required rating used in an electrical circuit:

    (A) improves safety

    (B) increases maintenance

    (C) may not work properly

    (D) is less expensive

18. Neutral wire is always:

    (A) whitish or natural

    (B) black

    (C) green

    (D) blue

19. To measure electrical power, you would use a(n):

    (A) ammeter

    (B) ohmmeter

    (C) voltmeter

    (D) wattmeter

20. If you operate an incandescent light bulb at less than its rated voltage:

    (A) The bulb will burn brighter and last longer.

    (B) The bulb will burn dimmer and last longer.

    (C) The bulb will burn brighter but won't last as long.

    (D) The bulb will burn dimmer but won't last as long.

Part 7

Auto & Shop Information
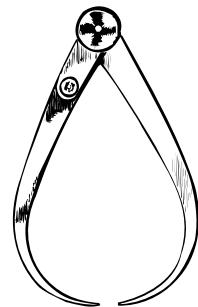
> Time: 11 minutes; 25 questions
>
> **Directions**
>
> This test is about automobiles, shop practices, and the use of tools. Pick the best answer for each question and then mark the corresponding space on your answer sheet.

1. Overheating the engine can cause all of the following problems EXCEPT:

   (A) burned engine bearings

   (B) enlarged pistons

   (C) melted engine parts

   (D) improved fuel efficiency

2. If an alternator overcharges the battery, a likely explanation is:

   (A) The governor has malfunctioned.

   (B) The voltage regulator isn't working properly.

   (C) The ignition coil has overheated.

   (D) The battery-acid solution is low.

3. A primary advantage of the electronic ignition system over conventional ignition systems is:

   (A) The electronic ignition system is less expensive to repair.

   (B) The electronic ignition system provides a higher voltage.

   (C) The electronic ignition system allows for use of a lower octane fuel.

   (D) All of the above

4. The primary purpose of piston rings is to:

   (A) seal the combustion chamber and allow the pistons to move freely

   (B) connect the piston to the crankshaft

   (C) allow fuel to enter the piston cylinder

   (D) provide lubrication to the piston cylinder

5. Connecting rods connect the piston to the:

   (A) flywheel

   (B) fuel pump

   (C) crankshaft

   (D) battery

6. In an overhead valve system (OHV), what mechanism opens and closes the valves?

   (A) rocker arms

   (B) camshaft

   (C) valve rotator

   (D) electrical energy from the alternator

7. If a car's ignition system, lights, and radio don't work, the part that's probably malfunctioned is the:

   (A) cylinder block

   (B) water pump

   (C) carburetor

   (D) battery

8. A gauge shows the complete loss of oil pressure while driving. The best action is to:

   (A) Stop by the gas station when convenient to top off the oil.

   (B) Pull over immediately and investigate the problem.

   (C) Drive directly to a repair garage.

   (D) Assume everything is fine and continue driving as usual.

9. A two-cycle engine will normally be found on:

   (A) small cars

   (B) large diesel trucks

   (C) trucks, vans, and some cars

   (D) snowmobiles, chainsaws, and some motorcycles

10. The difference between a single-acting and an opposed piston engine is:

    (A) Single-acting piston engines wear longer.

    (B) Opposed piston engines have cylinders set in a V-shape.

    (C) Single-acting piston engines have one piston per cylinder and opposed piston engines have two.

    (D) Single-acting piston engines are used with carburetors and opposed piston engines are used with fuel injectors.

11. A car equipped with limited-slip differential:

    (A) can be readily put into all-wheel (four-wheel) drive

    (B) won't lock up when the brakes are applied steadily

    (C) transfers the most driving force to the wheel with the greatest amount of traction

    (D) is rated for off-road driving

12. Pouring cold water on an overheated engine:

    (A) reduces damage caused by overheating

    (B) makes no difference

    (C) should only be done by a qualified mechanic

    (D) could cause the engine block to crack

13. Soft brake-pedal movement can be caused by:

    (A) air in the hydraulic brake system

    (B) malfunctioning brake shoes

    (C) loss of brake fluid

    (D) worn rotors

14. The safest way to make a hole in sheet metal is to:

    (A) burn it with a soldering iron

    (B) cut it using snips

    (C) punch it using a metal punch

    (D) get someone else to do it

15. Rebar is used to:

    (A) measure the depth of concrete

    (B) reinforce concrete

    (C) stir concrete

    (D) smooth concrete

16. Nail sets are used to:

    (A) protect your fingers from the hammer

    (B) set nails below the surface of wood

    (C) complete projects requiring sets of nails

    (D) mark the position where the nail should go

17. A ripsaw cuts:

    (A) against the grain of the wood

    (B) with the grain of the wood

    (C) most materials, including metal

    (D) only plastic

18. Sledges can be used to drive:

    (A) nails

    (B) screws

    (C) staples

    (D) bolts and chisels

19. To check for horizontal trueness, the best tool to use is a:

    (A) steel tape rule

    (B) plumb bob

    (C) level

    (D) sliding T-bevel

20. A bucking bar is used to:

    (A) pull nails

    (B) pry wood apart

    (C) drive rivets

    (D) drive screws

21. Washers that have teeth all around the circumference to prevent them from slipping are called:

    (A) shakeproof washers

    (B) jaw washers

    (C) flat washers

    (D) split-lock washers

22. The tool above measures:

    (A) an inside curve

    (B) an outside curve

    (C) the depth of a hole

    (D) the thickness of wire

23. The object above is a type of:

    (A) nut

    (B) washer

    (C) screw

    (D) bolt
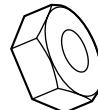
24. The tool above is used to:

    (A) finish concrete

    (B) spread joint compound

    (C) smooth wallpaper

    (D) dress wood

25. The chisel used to cut metal is:

    (A)

    (B)

    (C)

    (D)

Part 8

Mechanical Comprehension

Time: 19 minutes; 25 questions

Directions
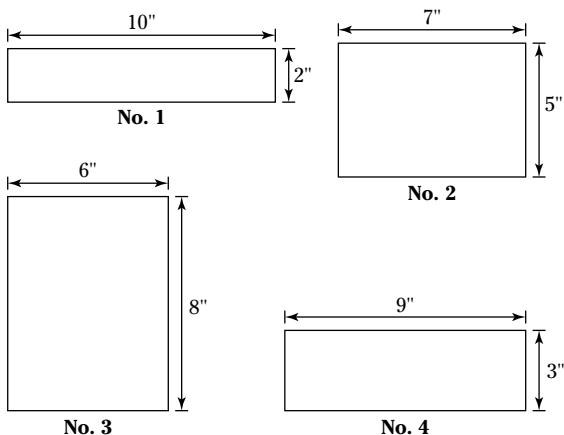
This test is about mechanical principles. Many of the questions use drawings to illustrate specific principles. Choose the correct answer and mark the corresponding space on the answer sheet.

1. An induction clutch works by:

    (A) magnetism

    (B) pneumatics

    (C) hydraulics

    (D) friction
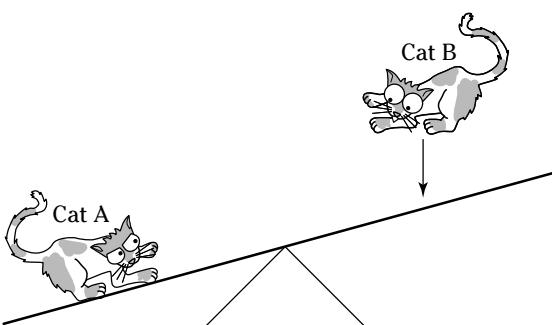
2. If a first class lever with a resistance arm measuring 2 feet and an effort arm measuring 8 feet are being used, what's the mechanical advantage?

    (A) 2

    (B) 4

    (C) 6

    (D) 1

No. 1

No. 2

No. 3

No. 4
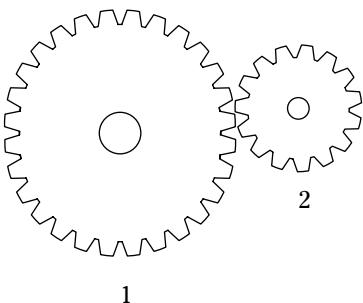
3. The bottoms of four boxes are shown above. The boxes all have the same volume. If postal regulations state that the sides of a box must meet a minimum height, which box is most likely to be too short to go through the mail?
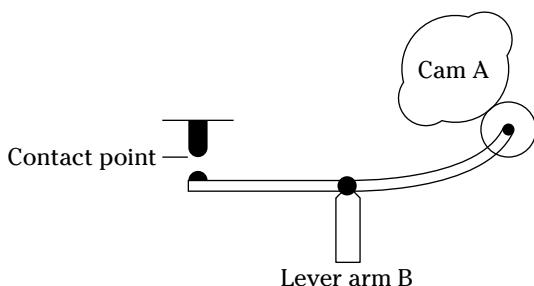
    (A) No. 4

    (B) No. 2

    (C) No. 1

    (D) No. 3

Cat B

Cat A

4. Looking at the figure above, when Cat B lands on the seesaw, Cat A will:

    (A) remain stationary

    (B) hit the ground hard

    (C) rise in the air quickly

    (D) enter the stratosphere

5. Air weighs about 15 psi. What's the amount of pressure (force) exerted on the top of your head, given a surface area of 24 inches?

    (A) 360 pounds

    (B) 625 pounds

    (C) 5⁄8 pound

    (D) 180 pounds

6. The force produced when a boxer's hand hits a heavy bag and "bounces" off it is called:

    (A) static electricity

    (B) magnetism

    (C) recoil

    (D) gravity

2

1

7. In the figure above, if Gear 1 has 25 teeth and Gear 2 has 15 teeth, how many revolutions does Gear 2 make for every 10 revolutions Gear 1 makes?

    (A) about 16⅔

    (B) 12

    (C) about ⅓ more

    (D) about 20

8. A cubic foot of water weighs about 62.5 pounds. If an aquarium is 18 feet long, 10 feet deep, and 12 feet wide, what's the approximate pounds-per-square-inch pressure (psi) on the bottom of the tank?

    (A) 2 psi

    (B) 4 psi

    (C) 5 psi

    (D) 7 psi

9. Springs used in machines are usually made of:

    (A) plastic

    (B) bronze

    (C) nylon fiber

    (D) steel

10. A clutch is a type of:

    (A) universal joint

    (B) coupling

    (C) gear differential

    (D) cam follower

Cam A

Contact point —

Lever arm B
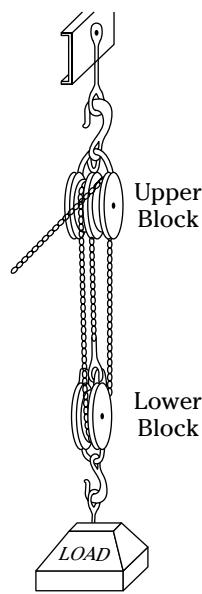
11. When Cam A completes one revolution, the lever will touch the contact point:

   (A) once

   (B) never

   (C) four times

   (D) twice
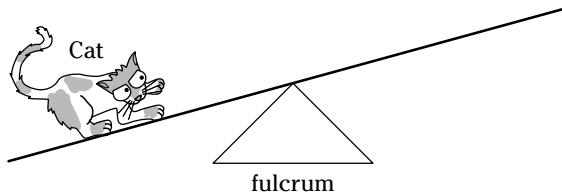
12. A single block-and-fall is called a:

   (A) fixed pulley

   (B) gun tackle

   (C) runner

   (D) sheave

Cat

fulcrum

13. In the figure above, if the fulcrum supporting the lever is moved closer to the cat, the cat will be:

   (A) easier to lift and will move higher

   (B) harder to lift but will move higher

   (C) easier to lift but will not move as high

   (D) harder to lift and will not move as high

Upper Block

Lower Block

LOAD
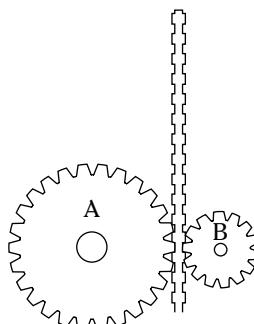
14. The mechanical advantage of the block-and-tackle arrangement shown above is:

   (A) 2

   (B) 4

   (C) 6

   (D) 1

A

B
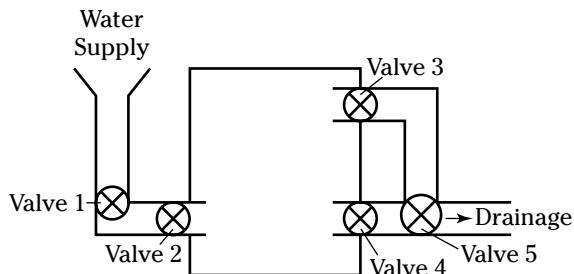
15. In the figure above, if the cogs move up the track at the same rate of speed, Cog A will:

   (A) reach the top at the same time as Cog B

   (B) reach the top after Cog B

   (C) reach the top before Cog B

   (D) have greater difficulty staying on track
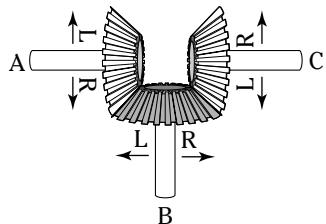
16. If a house key, a wooden spoon, a plastic hanger, and a wool jacket are all the same temperature, which one feels the coldest?

    (A) key

    (B) spoon

    (C) hanger

    (D) jacket
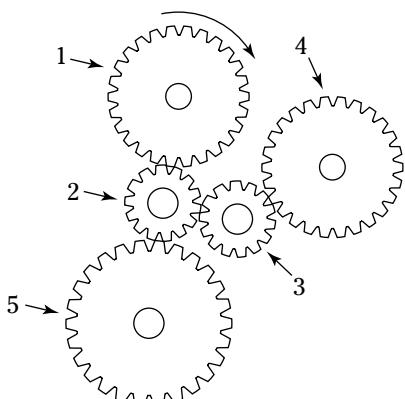
17. In the figure above, assume the valves are all closed. To fill the tank, but to prevent it from filling entirely, which valves should be open?

    (A) 1 and 2 only

    (B) 1, 2, and 3 only

    (C) 1, 2, and 4 only

    (D) 1, 2, 3, and 5 only
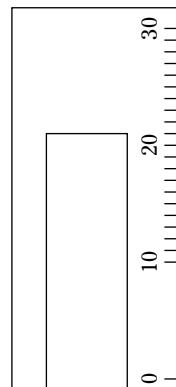
18. If Gear A is turned to the left:

    (A) Gear B turns to the right and Gear C turns to the left.

    (B) Gear B turns to the left and Gear C turns to the left.

    (C) Gear B turns to the right and Gear C turns to the right.

    (D) Gear B turns to the left and Gear C turns to the right.

19. If Gear 1 moves in a clockwise direction, which other gears also turn clockwise?
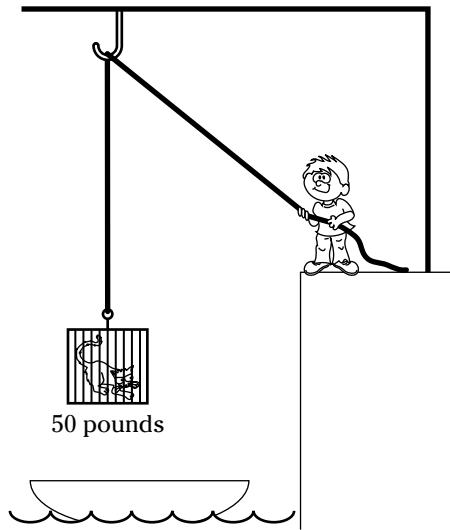
    (A) 3 and 5

    (B) 3, 4, and 5

    (C) 2 and 5

    (D) 3 and 4
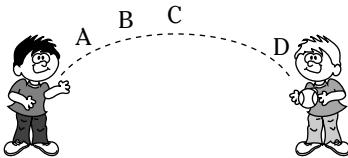
20. The pressure gauge in the figure above shows a reading of:

    (A) 15.0

    (B) 19.5

    (C) 21.0

    (D) 23.0
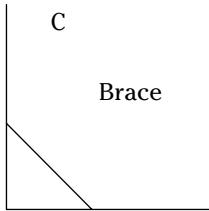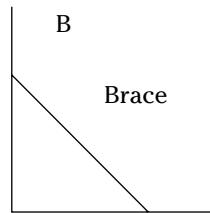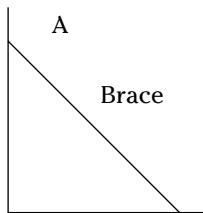
21. A way to determine the amount of power being used is to:

    (A) Multiply the amount of work done by the time it takes.

    (B) Multiply the distance covered by the time it takes to move a load.

    (C) Divide the amount of work done by 550 pounds per second.

    (D) Divide the amount of work done by the amount of time it takes.

22. A wood tool, a silver tool, and a steel tool are placed in boiling water for cleaning. Which tool gets the hottest?

    (A) steel

    (B) wood

    (C) silver

    (D) All three are equally hot.

50 pounds

23. A runner is being used in the figure shown. The cat lover lifting the 50-pound crate (with cat) is using how much effort (disregard friction, wind resistance, and the weight of the pulley and the rope)?

    (A) 50-pound effort

    (B) 100-pound effort

    (C) 25-pound effort

    (D) 10-pound effort

24. In the figure above, at what point was the ball traveling most slowly?

    (A) A

    (B) B

    (C) C

    (D) D

25. In the figure above, which angle is braced most solidly?

    (A) A

    (B) B

    (C) C

    (D) All are braced equally solidly.

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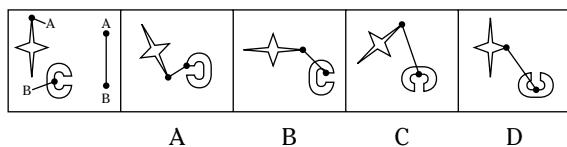
Part 9

Assembling Objects

Time: 15 minutes; 16 questions

Directions
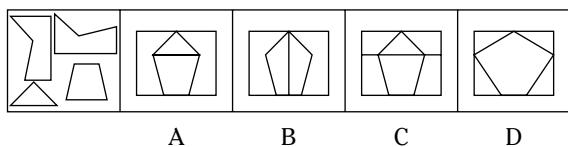
The Assembling Objects subtest consists of questions that measure your ability to mentally picture items in three dimensions. Each question is comprised of five separate drawings. The problem is presented in the first drawing and the remaining four drawings are possible solutions. Determine which of the choices best solves the problem shown in the first picture and then mark the corresponding choice on your answer sheet.

1.
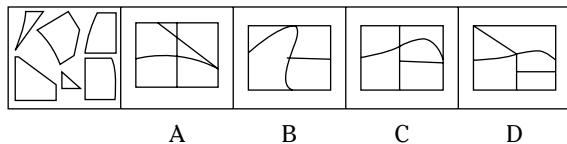
    A   B   C   D

6.
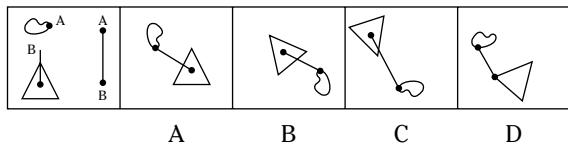
    A   B   C   D

2.
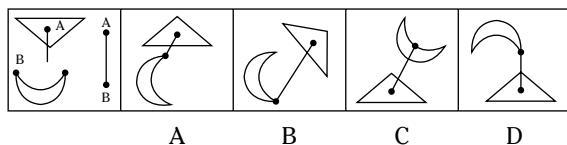
    A   B   C   D

7.
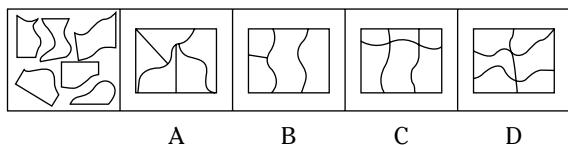
    A   B   C   D

3.
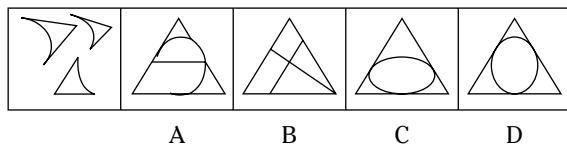
    A   B   C   D

8.
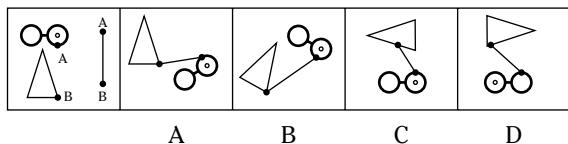
    A   B   C   D

4.
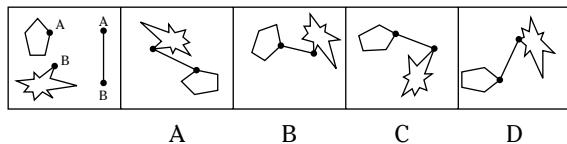
    A   B   C   D

9.
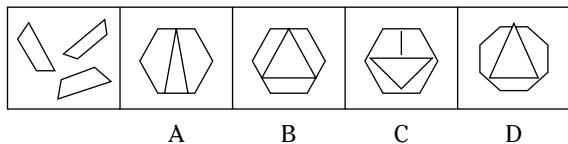
    A   B   C   D

5.
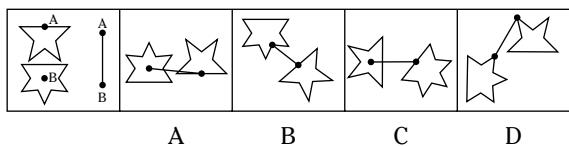
    A   B   C   D

10.
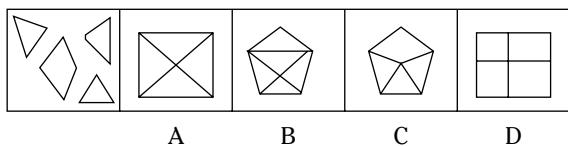
    A   B   C   D

11.
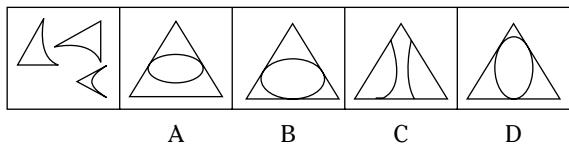
| | A | B | C | D |

14.
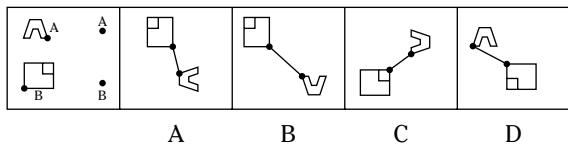
| | A | B | C | D |

12.
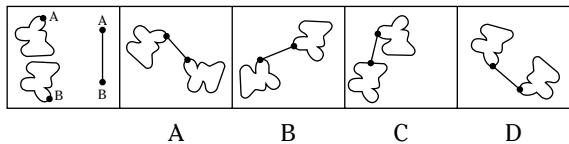
| | A | B | C | D |

15.

| | A | B | C | D |

13.


| | A | B | C | D |

16.

| | A | B | C | D |

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