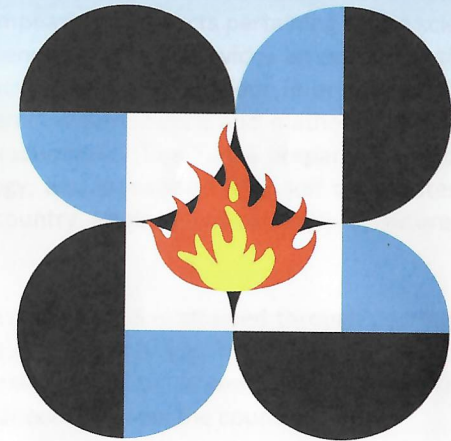


DEPARTMENT OF SCIENCE AND TECHNOLOGY
PHILIPPINE SCIENCE HIGH SCHOOL SYSTEM



REVIEWER 

FOR THE

**National
Competitive
Examination**

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Philippine Science High School System

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Reviewer for the PSHS System National Competitive Examination (NCE)

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FOREWORD

The Department of Science and Technology – Philippine Science High School System (DOST-PSHSS) is mandated to offer scholarship in secondary education with emphasis on subjects pertaining to the sciences to prepare its students for a science career. It provides an education that is humanistic in spirit, global in perspective, and patriotic in orientation. It offers a six-year curriculum that emphasizes science and mathematics and the development of well-rounded individuals. The PSHSS prepares its students for careers in science, technology, and innovation (STI) and contributes in nation-building by helping the country attain a critical mass of future professionals and leaders in S&T.

Admission to DOST-PSHSS is attained through passing the National Competitive Examination (NCE), a four-hour aptitude test designed to assess higher-order thinking skills of student applicants. This examination is conducted simultaneously across the country.

This reviewer provides exam strategies and practice drills that will familiarize examinees with what to expect in taking the NCE. The reviewer is accessible in both print and digital formats, ensuring widespread availability. The print version reaches remote areas with limited internet access, while the digital format is conveniently accessible through the PSHS System websites.

We hope that this reviewer inspires and empowers more students to apply for the NCE, opening doors to the premier science high school in the country. Together, help us make the next generation of STI professionals and leaders.

**OFFICE OF THE EXECUTIVE DIRECTOR
DOST - PSHS System**

TEST-TAKING SKILLS STRATEGIES

Having effective skills is essential to improve your examination performance and achieve good results. Below are strategic approaches to boost your chances of passing the test:

1. Preparation for taking the NCE

- **Study Plan** — Organize your study by creating a plan. Understand the main concepts of the subjects covered.
- **Study Time** — Allocate sufficient time for each subject. Avoid the urge to stay up late or cram the night before the examination.

2. Practice Answering Test Questions

- **Question Analysis** — Read the questions carefully before providing an answer. Understanding the question structure and considering the expected type of answer can be helpful.
- **Matching Concepts** — Whenever possible, align each answer with their relevance on the primary idea of the corresponding subject.

3. Test Research

- **Understanding Test Type** — Identify the specific test format, whether it will be multiple-choice, true or false, essay, etc. Familiarize yourself with the test structures to enhance your comfort level during the examination.
- **Practice with Sample Questions** — Engage with this reviewer to be familiar to the test style.

4. Time Tactics

- **Time Management** — Know the allocated time for each part of the test. Avoid rushing and ensure ample time for every question or section.
- **Start with the Easy Parts** — To maximize time utilization, begin by tackling questions that you find easier. This minimizes the risk of spending excessive time on more challenging sections.

5. Focus on the Details

- **Read Carefully** — Scrutinize questions thoroughly and respond accurately. Ensure a clear understanding of each question before providing your answer.
- **Proofreading** — If time permits, dedicate a moment to review and verify your answers before submission.

6. Stay Calm and Confident

- **Breathing** — When you feel too nervous, take deep breaths to stay calm.
- **Positive Outlook** — Avoid succumbing to negative thoughts. Believe in yourself and in your preparation.

By using these strategies, you can improve your test-taking abilities and ensure good results.

Good luck!

Admissions Office
DOST — PSHS System

References:

<https://pshs.edu.ph/>

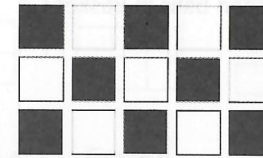
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TEST I - QUANTITATIVE ABILITY

1. If a black tile represents -2 and a white tile represents $+2$, what is the total value of all the blocks below?

- A. -30
B. -2
C. 0
D. 2
E. 30



2. If $3^2 = 3 \times 3 = 9$, and $3^4 = 3 \times 3 \times 3 \times 3 = 81$, then which of the following is equal to $10^5 + 10^7$?

- A. 10^{12}
B. 10^{35}
C. 100^{12}
D. $10,100,000$
E. $11,000,000$

3. Mathon went to Inkhorn Bookstore where he got a discount of ₱15 from a book that was marked 20% off. Then, he went to Lofty Bookstore to check out one of their limited edition books that is now discounted at 30%. If Mathon got a discount on the book from the Lofty Bookstore for the same amount as the original price of the book he got from Inkhorn Bookstore, how much is the difference between the two books' original prices?

- A. ₱ 75
B. ₱ 175
C. ₱ 250
D. ₱ 325
E. ₱ 600

4. Basket A, composed of blue and green balls, has a total of 50 balls. Basket B, composed of orange and yellow balls, has a total of 120 balls. The ratio of blue to green balls in Basket A is 9:1, while the ratio of yellow to orange balls in Basket B is 5:7. Albert removed all the green balls from Basket A and all the yellow balls from Basket B to place in Basket C. What is the ratio of yellow to green balls in Basket C?

A. 1:5
B. 1:10
C. 9:1
D. 10:1
E. 5:1

5. If $2^1 = 2$
 $2^2 = 4$
 $2^3 = 8$
and $2^4 = 16$, what must be the last digit of 2^{27} ?

A. 2
B. 4
C. 6
D. 7
E. 8

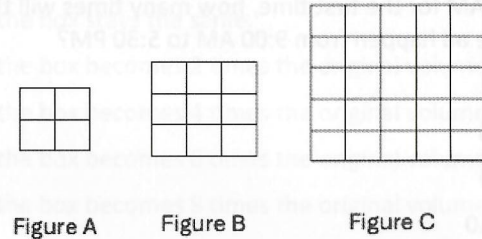
6. Prime numbers are defined as whole numbers greater than 1, and that can only be divided by 1 and themselves. For instance, 5 is a prime number since this can only be divided by 1 and 5, such as 5 divided by 1 is 5, while 5 divided by 5 is 1.

How many distinct prime number divisors does 72 have?

A. 0
B. 1
C. 2
D. 3
E. 4

7. In the figure below, each $\square$ represents a square of side 1 unit. Figure A has 5 squares, while Figure B has 14 squares. What is the total number of squares that can be found in Figure C?

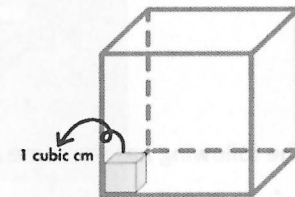
A. 16
B. 25
C. 32
D. 54
E. 55



8. The volume of a closed space can be measured by determining the number of cubic units that can fit inside a given space without any gaps or overlaps.

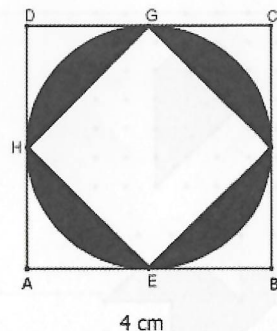
What is the length (in cm) of each edge of a cube whose volume is numerically equal to the area of a square whose length of each side measures 8 cm?

A. 64
B. 16
C. 8
D. 4
E. 2



9. Consider the figure below. ABCD is a square with E, F, G, and H as points at the middle of sides AB, BC, CD, and AD, respectively. ABCD and a circle intersect at points E, F, G, and H. If AB is 4 cm, find the area (in square centimeters) of the shaded portion.

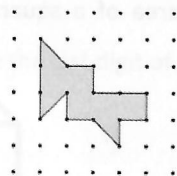
A. $4\pi - 8$
B. $4\pi - 22$
C. 8π
D. 6π
E. 4π



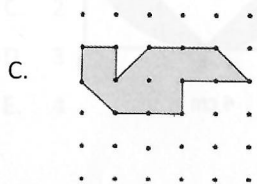
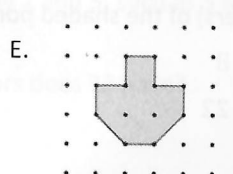
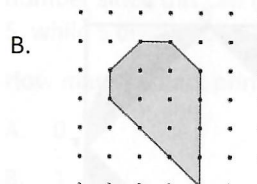
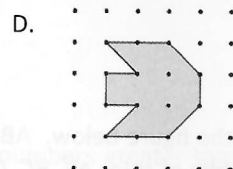
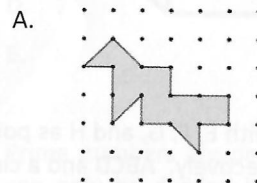
10. Two radio stations A and B aired an advertisement (ad) of a certain product. This ad is aired in station A every 15 minutes, while in station B every 20 minutes. If the two radio stations simultaneously air the ad at 8:00 AM for the first time, how many times will this simultaneously airing of the ad happen from 9:00 AM to 5:30 PM?

A. 1
B. 8
C. 9
D. 10
E. 60

11. In the given figure below, the horizontal and vertical distances of consecutive dots are 1 unit apart.



Which of the following has the same area as that of the given figure?



12. The volume of a rectangular solid can be computed by finding the product of its length (l), width (w), and height (h). What happens to the volume of a box if each l , w , and h are doubled?

A. The volume of the box stays the same.
B. The volume of the box becomes 2 times the original volume.
C. The volume of the box becomes 4 times the original volume.
D. The volume of the box becomes 6 times the original volume.
E. The volume of the box becomes 8 times the original volume.

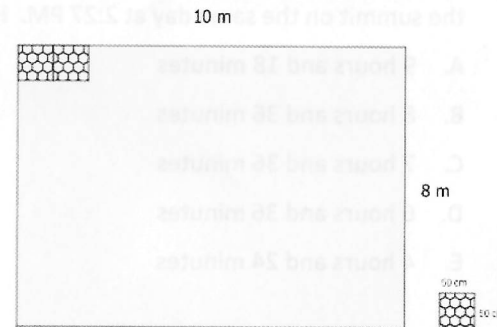
13. For a project, Linda needs to wrap a number of identical cylindrical tin containers with paper, as shown in the figure below. To fully wrap one tin container, she needs a piece of paper that has a length of 4 inches and a width of 2 inches. Her mother gave her a big piece of paper that had a length of 15 inches and a width of 4 inches. What is the maximum number of these tin containers can she fully wrap?

A. 6
B. 7
C. 8
D. 9
E. 10



14. A $10\text{ m} \times 8\text{ m}$ floor area is to be completely covered by square tiles with dimensions $50\text{ cm} \times 50\text{ cm}$, as shown in the figure below. How many square tiles are needed to completely cover the floor area?

A. 80
B. 320
C. 400
D. 2500
E. 3200



15. To determine the covered distance traveled by a vehicle at a given period, the average speed of the car must be multiplied by the time spent. For instance, a car that travels at a speed of 50 km/hr can cover 50 km in one hour.

Consider two cars, A and B, started from the same place and at the same time. Car A traveled north at an average speed of 80 km/hr. Car B traveled north as well at an average speed of 120 km/hr. How far apart are the two cars (in km) if both cars traveled for 30 minutes?

- A. 10
B. 20
C. 40
D. 60
E. 80
16. The minute hand of a wall clock is 5 cm long. How far (in cm) does the tip of the minute hand travel in 12 hours?
- A. 10π
B. 120π
C. 240π
D. 360π
E. 720π
17. Jek and Pau went hiking. They started to climb at 6:51 AM and reached the summit on the same day at 2:27 PM. How long did they hike?
- A. 9 hours and 18 minutes
B. 8 hours and 36 minutes
C. 7 hours and 36 minutes
D. 6 hours and 36 minutes
E. 4 hours and 24 minutes

18. In an office, all documents are required to be printed on a letter-sized paper which is 8.5 inches by 11 inches, with a 1-inch margin on all sides. What is the area (in square inches) of the portion of the paper where printing is allowed? (Assume that printing at the back of the paper is not allowed.)

- A. 58.5
B. 60
C. 65
D. 75
E. 93.5

19. Figures 1 to 4 indicate a certain pattern about the number of line segments whose endpoints are on the circle. If the pattern continues, how many line segments will there be in the 8th figure?

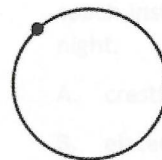


Figure 1

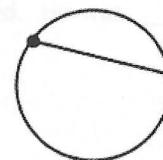


Figure 2

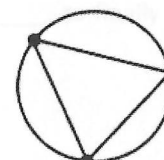


Figure 3

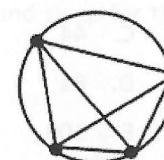


Figure 4

- A. 21
B. 22
C. 27
D. 28
E. 29

20. Figures 1 to 4 indicate a certain pattern of square tiles. If the pattern continues, how many shaded-square tiles will there be in the 10th figure?

Figure 1

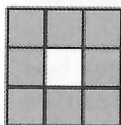


Figure 2

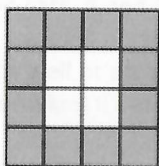


Figure 3

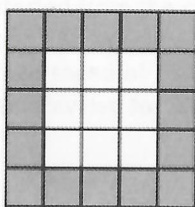
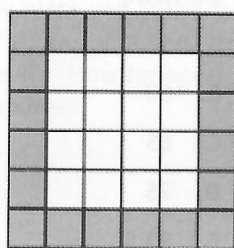


Figure 4



- A. 36
B. 40
C. 44
D. 81
E. 100

TEST II - VERBAL APTITUDE

1. Choose the letter of the word that is spelled CORRECTLY.

- A. inoculate
B. innoculate
C. innoculate
D. inoculate
E. inoculatte

For items 2-3, choose the letter of the word that BEST completes the sentence.

2. Kiefer was exhausted after a long day of performing the drills that his coach instructed. He was _____ to finally rest and sleep for the night.
- A. crestfallen
B. elated
C. exhilarated
D. invigorated
E. relieved
3. Sarah showed her _____ spirit when she stood up to the bully and defended her friend.
- A. aggressive
B. courageous
C. emphatic
D. rebellious
E. nonchalant

4. The young woman, who is passionate about climate change, is considered a subversive by some members of the airline industry. The underlined word is CLOSEST in meaning to
- anarchist
 - heretic
 - terrorist
 - traitor
 - rebel
5. "The hidden dolls were very beautiful and made of costly materials like delicate porcelain and rich ivory." The underlined word is CLOSEST in meaning to
- abundant
 - complex
 - fruitful
 - pleasant
 - wealthy

For items 6-9, choose the letter of the word that BEST expresses a relationship similar to that of the first word pair.

6. Jupiter : planet :: Moon : _____
- asteroid
 - galaxy
 - nebula
 - satellite
 - star

7. ball : bat :: tennis : _____
- club
 - javelin
 - pole
 - racquet
 - stick
8. square : cube :: circle : _____
- oval
 - sphere
 - cylinder
 - triangle
 - rectangle
9. guitar : strings :: piano : _____
- keys
 - frets
 - hammers
 - cymbals
 - drumsticks

For items 10-11, choose the letter of the sentence that makes use of proper punctuation.

- 10.
- "Did I not tell you," her mother said, "that biking is not as hard as it looks?"
 - "Did I not tell you," her mother said, "that biking is not as hard as it looks?"
 - "Did I not tell you", her mother said, "that biking is not as hard as it looks?"
 - "Did I not tell you," her mother said, "That biking is not as hard as it looks?"
 - "Did I not tell you," her mother said, "That biking is not as hard as it looks?"

11.

- A. My favorite sports are basketball, volleyball, and boxing.
- B. My favorite sports are basketball, volleyball and boxing.
- C. My favorite sports are, basketball, volleyball, and boxing.
- D. My favorite sports are: basketball, volleyball, and boxing.
- E. My favorite sports are basketball; volleyball; and boxing.

For items 12-14, choose the letter of the preposition or conjunction that will BEST complete each sentence.

12. The boy is sad because his pet cat has been missing _____ last week.

- A. after
- B. by
- C. for
- D. from
- E. since

13. Julie walked to the park _____ his brother, _____ they played badminton for hours.

- A. to, when
- B. with, but
- C. with, and
- D. for, because
- E. and, because

14. Jenny was excited _____ her graduation celebration, but she was also nervous _____ the speech she had to deliver.

- A. about, about
- B. for, with
- C. at, in
- D. on, for
- E. in, about

For items 15-18, choose the letter of the underlined word or phrase that contains an error. If there is NO error, choose E.

15. The students had cleaned the laboratory instruments

A B C

after conducting the experiment. NO ERROR

D E

16. Even after the harvest, the farmers did not wanted to take a rest

A B C

from working in the fields. NO ERROR

D E

17. Karen had went to the market to buy food supplies, but she forgot to

A B C

bring her wallet with her. NO ERROR

D E

18. The teacher asks the students if they understand the concept, and then

A B

she explained it again for clarification. NO ERROR

C D E

19. The class president has a tendency to sit on the fence and leave issues unresolved. The underlined phrase is an idiom that means "to be _____."

- A. idle
- B. indecisive
- C. lazy
- D. lethargic
- E. negligent

20. The girl took the scholarship opportunity because she knew that such chances come once in a blue moon. The underlined phrase is an idiom that means
- fortuitously
 - improbably
 - occasionally
 - rarely
 - unexpectedly
21. The examination was difficult but Trebor was able to _____, so he got a high score.
- spill the beans
 - bite the bullet
 - burn the midnight oil
 - hit the nail in the head
 - make it a piece of cake

For items 22-23, arrange the sentences to form a coherent paragraph.

- 22.
- Three years ago, my brother gave me a puppy.
 - Bruno made me excited to go home from school.
 - I would always find him patiently waiting by the door.
 - Then we would play until it was time for dinner.
 - I still remember that first day like it was just yesterday.
 - I named him Bruno, because of his brown fur.
- 4-3-2-5-6-1
 - 4-5-6-3-2-1
 - 1-6-5-4-3-2
 - 1-6-5-3-2-4
 - 1-6-5-3-4-2

- 23.
- First, he cleared the area of weeds and rocks.
 - Jason wanted to plant a garden in his backyard.
 - After that, he carefully placed the seeds in the holes and covered them with soil.
 - Then, he dug small holes in the soil for the seeds.
 - Finally, he placed a fence around the garden to protect it from animals.
 - Next, he watered the soil thoroughly.
- 2-1-4-3-6-5
 - 2-1-3-4-5-6
 - 2-4-3-6-1-5
 - 2-6-1-4-3-5
 - 2-5-4-1-3-6

For items 24-30, read the following passages carefully and answer the questions.

Quiapo is a labyrinth of stores that sells everything from the mundane to the arcane. In one of these shops, there was a doll-maker whose brand of magic was the sinister kind.

Her dolls looked ordinary enough. Piles of plastic dolls with blinking blue or brown eyes were on display together with orange, purple, and white teddy bears, and pink pigs with curly tails.

She had a secret collection, however, hidden away at the back of the store. The hidden dolls were very beautiful and made of costly materials like delicate porcelain and rich ivory. Their most marvelous feature was their eyes. Each doll's eye was a precious gemstone. Each doll was unique. Not one was for sale.

She scanned the crowd.

There.

The doll-maker sensed the little girl. Alone. A street urchin. Yes. This one was ripe for the picking. With a wave of her hand, she beckoned the little girl to come over. Obediently, the child approached.

"What is it, lola?"

The doll-maker smiled, whispered in the girl's ear, and drew back the curtains of the shop entrance. The girl stepped inside.

*-Excerpt from "Doll Eyes" by Eline Santos,
<https://artsandculture.google.com/story/3wURytX5oq1nKw>*

24. What do you think would happen to the little girl?
- A. She would be sold to a syndicate.
 - B. She would be turned over by the doll-maker to the DSWD.
 - C. She would be given a doll by the doll-maker from her collection.
 - D. She would be turned into one of the hidden dolls by the doll-maker.
 - E. She would be adopted by the doll-maker and make her an apprentice.

25. **Mood** is the overall atmosphere or feeling evoked in a piece of writing. Which word most strongly sets the mood of the given excerpt?

- A. alone
- B. arcane
- C. sinister
- D. mundane
- E. marvelous

26. Based on the excerpt, what is the story's central message?

- A. Materialism conquers the innocent.
- B. Things are not always as they seem.
- C. Be careful when talking to strangers.
- D. Children should be protected by adults.
- E. When people show you who they are, believe them.

The Industrial Revolution brought significant changes in manufacturing, transportation, and society as a whole. It began in Britain in the late 18th century and made a tremendous impact on the lives of the people, especially in Western countries because it resulted in massive urbanization. The steam engine invented by James Watt in 1755 is one of the notable advancements during the period because it revolutionized transportation by powering locomotives and steamships, leading to faster and more efficient travel. Additionally, the increased mechanization of production processes led to the growth of factories and urbanization as people migrated from rural areas to cities in search of employment opportunities.

27. What is the meaning of "urbanization" as used in the passage?

- A. agricultural advancement
- B. expansion of cities
- C. migration of people
- D. rural development
- E. technological inventions

28. What does the passage imply about the impact or effect of the steam engine on transportation during the Industrial Revolution?

- A. Use of locomotives declined.
- B. Transportation remains the same.
- C. People migrate to other cities.
- D. Travel became faster and more efficient.
- E. Profits for factories increased.

Marilou loved spending her weekends at the local library. She would often lose herself among the shelves, exploring various genres from adventure tales to mysteries. Her favorite spot was the cozy reading nook by the window, where she could immerse herself in her latest book and let her imagination wander. As she turned the pages of the novel she was reading, she couldn't help but feel grateful for the magical world books had opened up for her.

29. "Marilou loved to spend her weekends _____."

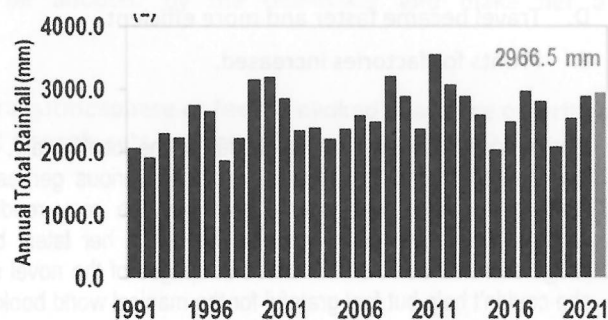
- A. above the library
- B. around the library
- C. beside the library
- D. in the library
- E. on the library

30. Why does Marilou enjoy spending time at the library?

- A. Because she has a lot of free time.
- B. Because she wants to be alone.
- C. Because she enjoys exploring books.
- D. Because she has to review and study.
- E. Because she likes to stay in a quiet place.

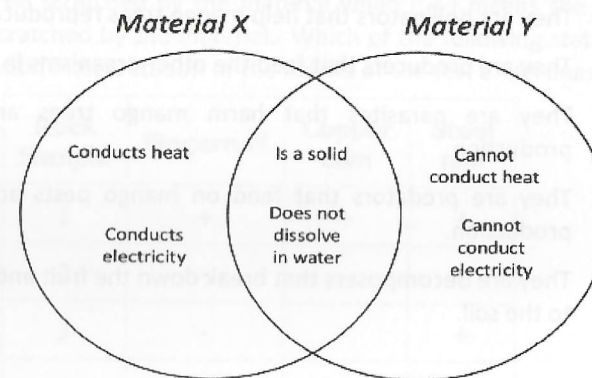
TEST III - SCIENTIFIC ABILITY

1. The graph from PAGASA's 2022 Annual Climate Bulletin summarizes the annual total rainfall experienced by the country from 1991-2022. In which year did the Philippines experience the HIGHEST annual total rainfall?



- A. 1999
B. 2000
C. 2008
D. 2011
E. 2017
2. Scientists are studying the effects of Variable X on the growth of tomato plants. They plant identical tomato seedlings in pots with the same soil and give them the same amount of water. They use a different fertilizer for four of the seedling groups and no fertilizer for the other group. What is Variable X in this experiment?
- A. The type of fertilizer used
B. The initial size of the tomato seedlings
C. The type of soil the plants are grown in
D. The amount of water the plants receive
E. The amount of sunlight the plants receive

3. The following Venn diagram shows similarities and differences between materials X and Y. Which of the statement can be inferred from the diagram?



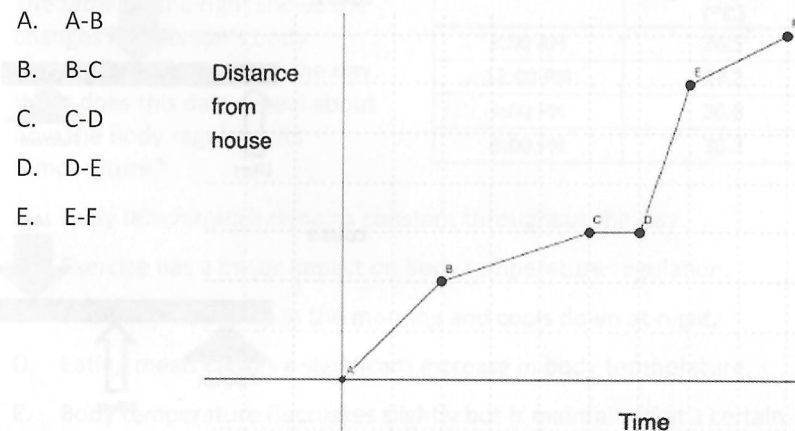
- A. Material X is copper, material Y is salt.
B. Material X is iron, material Y is copper.
C. Material X is iron, material Y is rubber.
D. Material X is rubber, material Y is iron.
E. Material X is salt, material Y is rubber.
4. Marvice wants to find out how the angle of a ramp affects the distance a skateboard travels. She has skateboards, a ramp, and measuring tape. What can she do to answer this question?
- A. Release the skateboard from different heights onto a flat surface and measure how far it rolls each time.
B. Use different skateboards on the same ramp at different angles and measure how far each skateboard travels.
C. Set the ramp at one angle and release the skateboards multiple times, measuring the distance traveled each time.
D. Set the ramp at different angles and release the skateboard from the same starting point, measuring the distance traveled each time.
E. Use the same skateboard and angle but change the surface the skateboard rolls on (carpet, tile, wood) and measure the distance traveled.

5. Rey notices small brown flies gathering around fallen mango fruits in his backyard. What is the most likely role of these flies in the ecosystem?
- They are pollinators that help mango trees reproduce.
 - They are producers that feed the other organisms in the ecosystem.
 - They are parasites that harm mango trees and reduce food production.
 - They are predators that feed on mango pests and increase food production.
 - They are decomposers that break down the fruit and return nutrients to the soil.
6. A 1500 g sample of seawater was evaporated and 50 g of salt remained. How many grams of the same sample must be evaporated to produce 10 g of salt?
- 30
 - 100
 - 150
 - 300
 - 500
7. Bernard wants to test if the temperature of water affects how quickly sugar dissolves. He has 3 cups of water at different temperatures (hot, warm, cold) and sugar packets. Which set up will help him answer the question?
- Heat all the cups of water to the same temperature, then add sugar and see which one dissolves first.
 - Stir the sugar into each cup of water for different amounts of time and see which one dissolved first.
 - Use different types of sugar (white, brown, confectioner's) in each cup of water and observe which dissolves the fastest.
 - Add different amounts of sugar to each cup of water at different temperatures and see how long it takes for each to dissolve completely.
 - Add the same amount of sugar to each cup of water and stir them all for the same amount of time, then observe which one dissolves first.

8. The following table shows the results of scratching four rock samples with other materials to test hardness. The mark [+] means the rock sample can be scratched by the material while [-] means the sample cannot be scratched by the material. Which of the following statements is the most valid interpretation of the results of the test of hardness?

Rock Sample	Fingernail	Copper coin	Steel nail
1	+	+	+
2	-	-	-
3	-	-	+
4	-	+	+

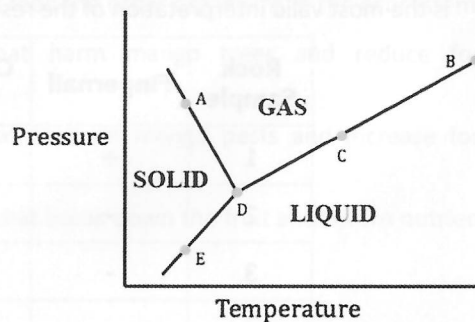
- Sample 1 is the hardest of the samples.
 - Sample 4 is the softest of the samples.
 - Sample 3 can scratch Samples 2 and 4.
 - Sample 4 can be scratched by Sample 1.
 - Sample 2 can scratch Samples 1, 3, and 4.
9. The graph below represents Carrie's journey as she walks to school every day. Which segment of the graph shows Carrie walking at her fastest speed?



- A-B
- B-C
- C-D
- D-E
- E-F

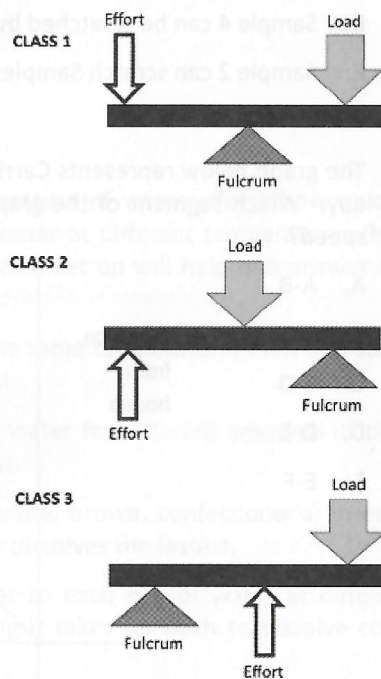
10. The following figure is a phase diagram of an unknown substance. It tells us if a substance is a solid, liquid, or gas at a certain temperature and pressure. At which point/s will you likely see BOTH solid and gas phases of the unknown matter at the same temperature and pressure?

- A. A only
- B. D only
- C. A and D only
- D. A and E only
- E. A, D, and E only

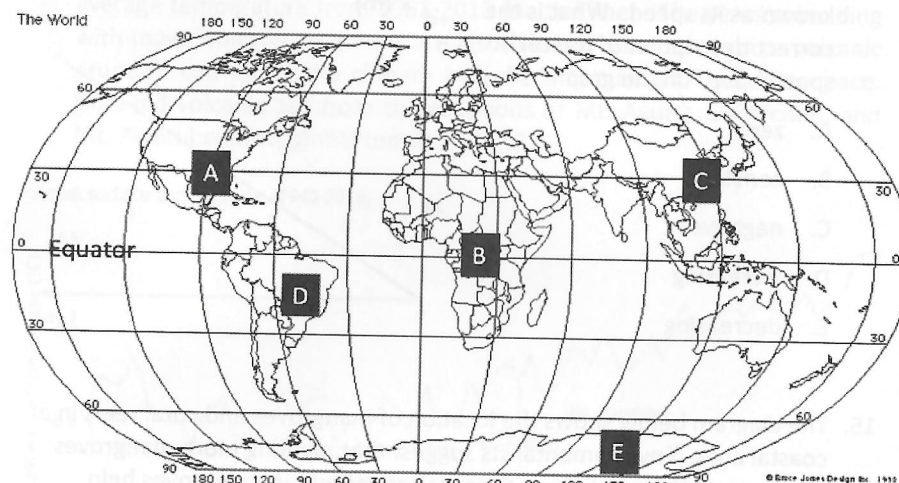


11. Levers are classified into three classes depending on the positions of their parts (fulcrum, effort, and load) as shown in the figure. Which of the following objects are examples of Class 3 levers?

- A. scissors, pliers
- B. seesaw, crowbar
- C. fishing rod, broom
- D. door, bottle opener
- E. wheelbarrow, nail clippers



12. Which two locations in the world map below are likely to have very similar climates?



- A. A and B
- B. A and C
- C. A and D
- D. B and D
- E. C and E

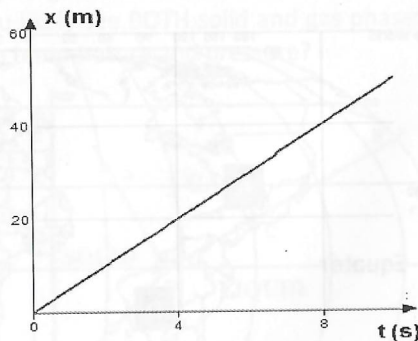
13. The table on the right shows the changes in a person's body temperature throughout the day. What does this data reveal about how the body regulates its temperature?

Time	Body Temperature (°C)
8:00 AM	36.5
12:00 PM	37.2
4:00 PM	36.8
8:00 PM	36.3

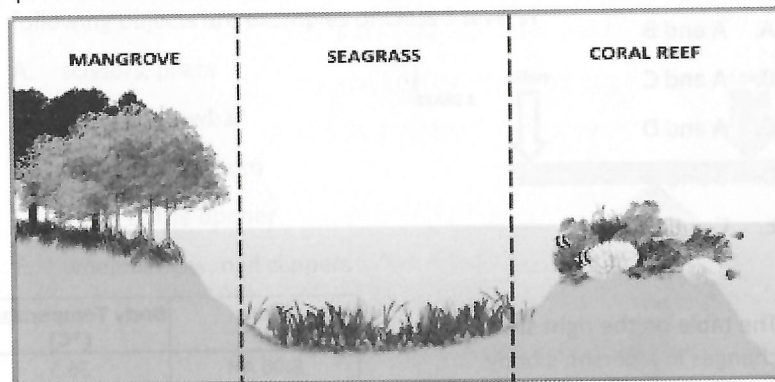
- A. Body temperature remains constant throughout the day.
- B. Exercise has a major impact on body temperature regulation.
- C. The body warms up in the morning and cools down at night.
- D. Eating meals causes a significant increase in body temperature.
- E. Body temperature fluctuates slightly but is maintained at a certain range.

14. The graph on the right shows the distance covered by a battery powered car over a period of time, also known as its speed. What is the correct description of the car's speed based on the graph?

- A. zero
- B. constant
- C. negative
- D. increasing
- E. decreasing



15. The diagram below shows the location of mangroves and coral reefs in a coastal area. Environmentalists suggest that planting more mangroves may protect the corals from degradation. How can mangroves help protect coral reefs?

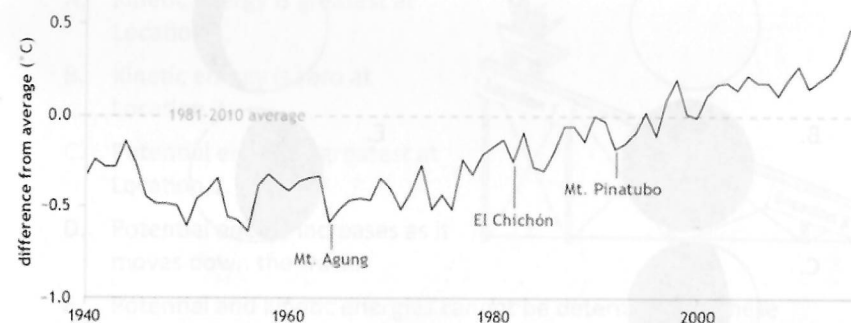


(Source: DeValck & Rolfe 2018, <https://doi.org/10.1016/j.marpolbul.2018.03.017>)

- A. They provide shade for the corals and prevent them from overheating.
- B. They attract more fish to the area, which feed on the algae that harm the coral.
- C. They filter pollutants from the water and improve the water quality for the corals.
- D. They release chemicals that directly protect the corals from diseases and predators.
- E. They act as natural barriers and break the force of waves before they reach the reefs.

16. The graph from the National Oceanic and Atmospheric Administration shows the temperature of the earth's surface since 1940 compared to the average temperature from 1981-2010 (dotted line). The years coinciding with major volcanic eruptions are also labeled. Fine ash from a volcanic eruption can affect the climate by reflecting sunlight back into space. How did volcanic ash from the eruptions of Mt. Agung, El Chichon, and Mt. Pinatubo affect global temperatures?

Global surface temperature (1940-2016)



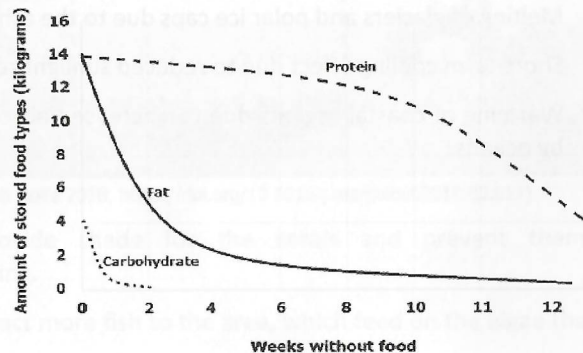
- A. Increase in global temperature due to the greenhouse effect
- B. No significant change in temperature since the ash quickly settles
- C. Melting of glaciers and polar ice caps due to the ash absorbing heat
- D. Short-term cooling effect due to reduced sunlight reaching the Earth
- E. Warming of coastal regions due to increased absorption of sunlight by oceans

17. A group of Grade 7 students were tasked to observe the different phases of the Moon (new moon, first quarter, full moon, and last quarter) in its 29.5-day cycle. On a particular night, the moon was seen as illustrated by the diagram on the right. What will the Moon look like after four weeks when observed from the same position in the night sky?



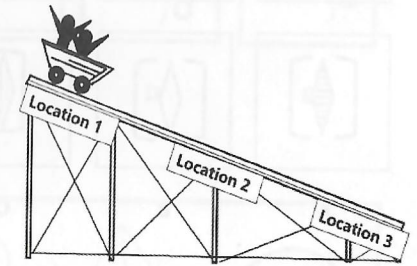
- A. B. C. D. E.

18. The graph below shows the amount of nutrient (carbohydrate, fat, and protein) depletion or reduction resulting from starvation (weeks without food). Which of these statements is a valid inference based on the graph?



- A. Fat levels in the body decrease at a constant rate.
 B. Starving yourself for weeks will make you lose weight.
 C. Protein levels are the last to decrease during starvation.
 D. Starving will not affect your nutrient levels during the first month.
 E. Carbohydrates are depleted first because they are the least important.

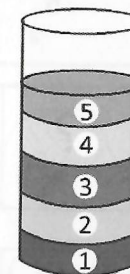
19. A roller coaster moves down along its inclined frictionless track. It initially starts from rest at location 1 and moves through locations 2 and 3. As the cart moves down the track, it has both potential and kinetic energies. Potential energy is the stored energy of an object due to its position (greatest at the highest position of the object) while kinetic energy is the energy of an object due to its motion (dependent on the mass and velocity of the object). Which of the statement correctly describes the energy of the roller coaster at specific locations?



- A. Kinetic energy is greatest at Location 1.
 B. Kinetic energy is zero at Location 3.
 C. Potential energy is greatest at Location 1.
 D. Potential energy increases as it moves down the track.
 E. Potential and kinetic energies cannot be determined at these locations.

20. Delfin carefully poured different liquids into a glass tube. The liquids did not mix and five layers were formed. These are labeled 1-5 in the diagram. The table beside the diagrams lists the densities of the materials used. Which layer corresponds to water?

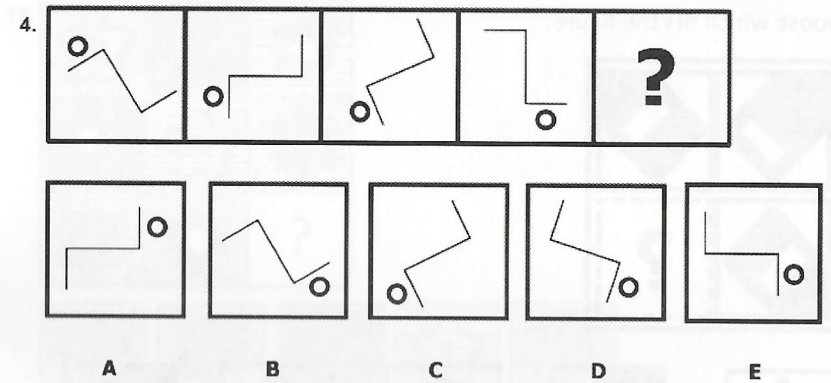
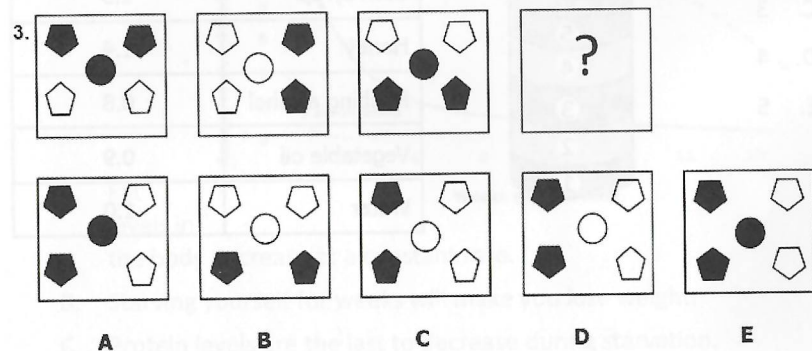
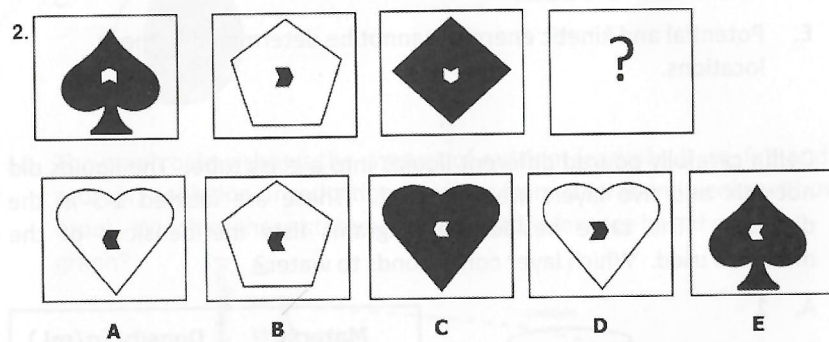
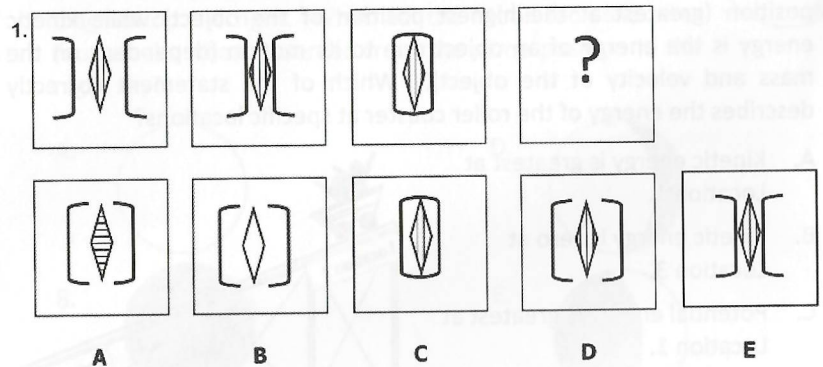
- A. 1
 B. 2
 C. 3
 D. 4
 E. 5



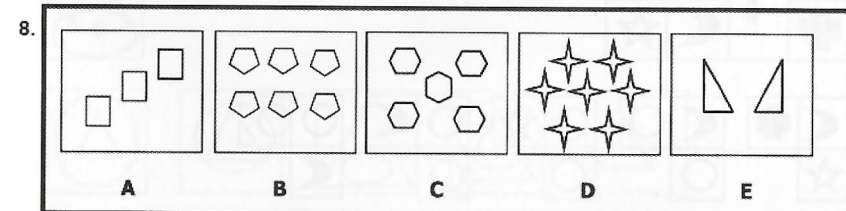
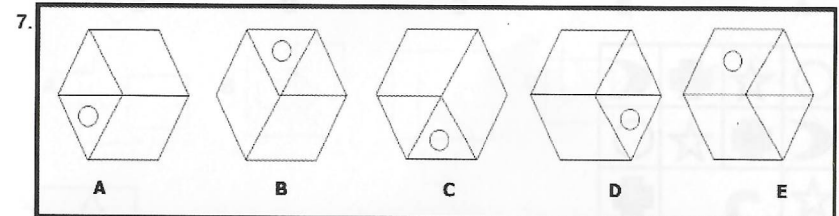
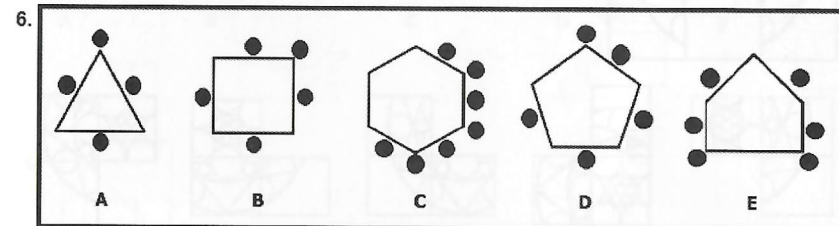
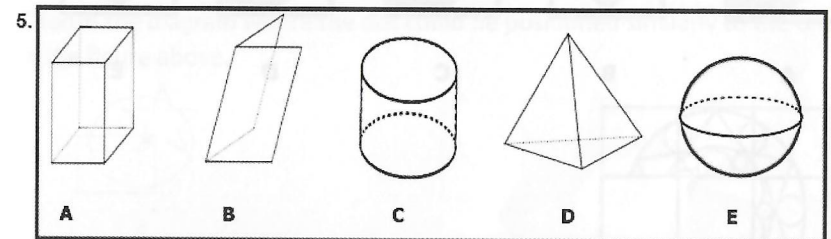
Material	Density (g/mL)
Corn syrup	1.3
Honey	1.4
Rubbing alcohol	0.8
Vegetable oil	0.9
Water	1.0

TEST IV - ABSTRACT REASONING

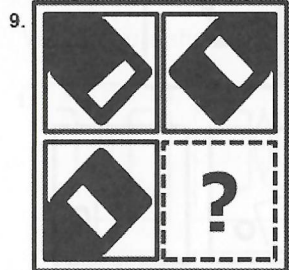
Which figure should come next?



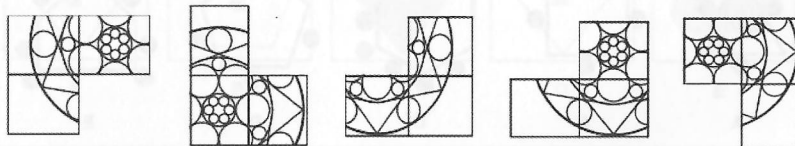
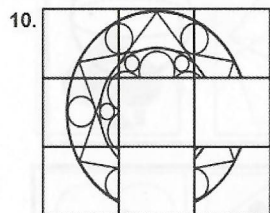
Choose which figure is different.



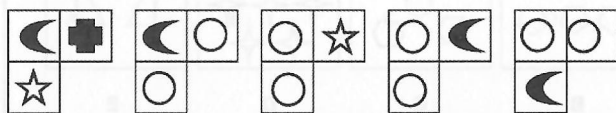
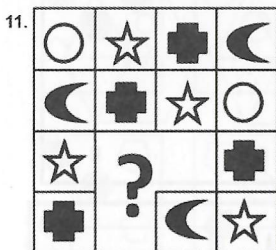
Choose which fits the figure.



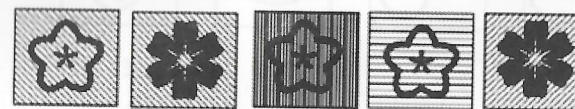
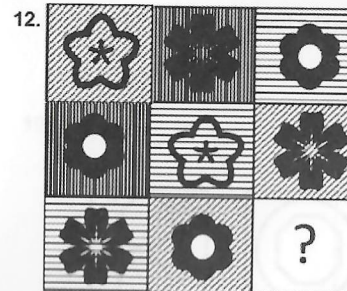
A B C D E



A B C D E

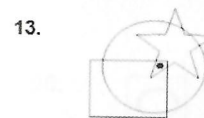


A B C D E

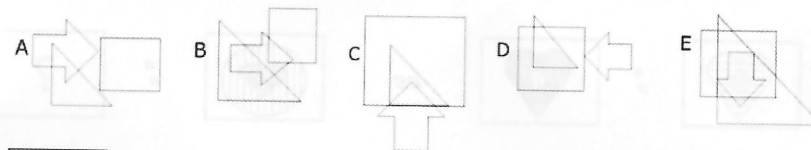
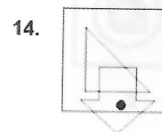


A B C D E

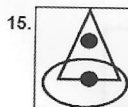
Choose the diagram where the dot could be positioned similarly to the one in the figure above.



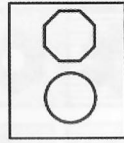
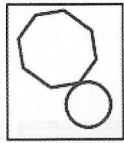
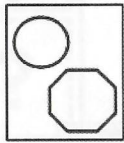
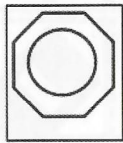
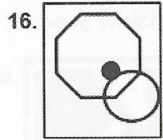
A B C D E



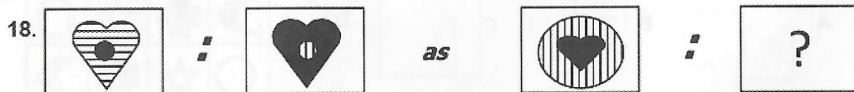
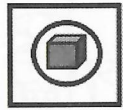
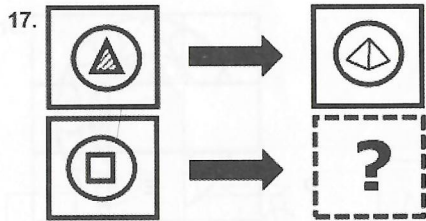
A B C D E



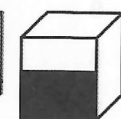
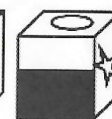
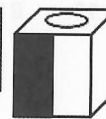
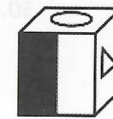
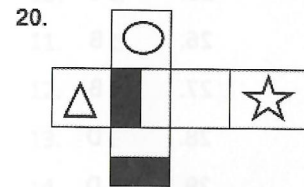
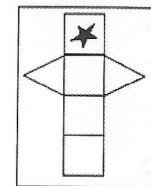
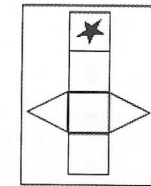
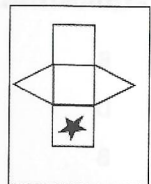
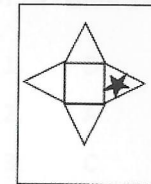
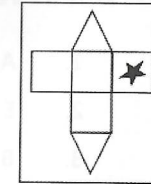
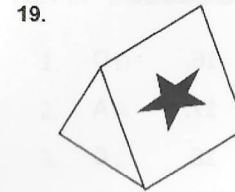
A B C D E



Find the figure that completes the analogy.



Which pattern will create the figure on the left?



ANSWER KEY

TEST I - QUANTITATIVE ABILITY

1. B
2. D
3. B
4. D
5. E
6. C
7. E
8. D
9. A
10. C
11. C
12. E
13. B
14. B
15. B
16. B
17. C
18. A
19. D
20. C

TEST II - VERBAL APTITUDE

- | | |
|-------|-------|
| 1. A | 16. D |
| 2. E | 17. A |
| 3. B | 18. C |
| 4. E | 19. B |
| 5. D | 20. D |
| 6. D | 21. C |
| 7. D | 22. D |
| 8. B | 23. A |
| 9. A | 24. D |
| 10. B | 25. C |
| 11. A | 26. B |
| 12. E | 27. B |
| 13. C | 28. D |
| 14. A | 29. D |
| 15. B | 30. C |

ANSWER KEY

TEST III - SCIENTIFIC ABILITY

1. D
2. A
3. C
4. D
5. E
6. D
7. E
8. E
9. D
10. C
11. C
12. B
13. E
14. B
15. C
16. D
17. D
18. C
19. C
20. C

TEST IV - ABSTRACT REASONING

1. D
2. A
3. C
4. B
5. B
6. D
7. E
8. B
9. C
10. B
11. B
12. C
13. D
14. B
15. D
16. A
17. C
18. C
19. C
20. B